UNEMPLOYMENT: SOME ASPECTS OF THE NEW ZEALAND EXPERIENCE, 1960-1981.

A thesis presented in partial fulfilment of the requirements for the degree of Doctor of Philosophy in Economics at Massey University.

John Robert Llewellyn Hicks

1984

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ABSTRACT

In the late 1960s both Friedman and Phelps argued that there existed a "natural" rate of unemployment which could not be reduced in the long run through an expansion of demand without accelerating inflation. The co-existence of rising unemployment and spiralling inflation throughout much of the 1970s was seen as evidence in support of the propositions of Friedman and Phelps and led to the conclusion that the natural rate of unemployment had risen and was continuing to rise. Theoretical support was provided by the development of job-search theory which attributed the rise in unemployment to rational, voluntary decisions on the part of the unemployed.

This thesis examines the unemployment experience of New Zealand over the period 1960-1981 in the context of the job-search model. That New Zealand has an unemployment problem is established in Part One by a comparative study of New Zealand data with that from seven other industrialized nations. This study also depicts the pattern of New Zealand's unemployment experience and shows it to be in keeping with the search model as it is subsequently developed in Part Two.

Our representation of the search model enables us to identify a number of tests of search in the New Zealand context and these are conducted in Part Three. Not unexpectedly the empirical analysis is

hindered by the paucity of labour force data in New Zealand. Although some attempt is made to adjust the data to meet our needs this is only partially successful and care must therefore be taken in interpreting the results. In general we find that there is some evidence for the existence of the phenomenon of search in the New Zealand labour market but that its contribution to the rise in unemployment since the mid 1970s is negligible.

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TABLE OF CONTENTS

LIST OF FIGURES

CHAPTER TEN

LIST OF TABLES

CHAPTER NINE

CHAPTER TEN

PART ONE

DEFINING THE PROBLEM

Part One establishes the boundaries of our enquiry and sets out in detail the character of New Zealand's unemployment as it is depicted in the official statistics.

CHAPTER 1

INTRODUCTION

New Zealand is a country almost unique in its post-World War Two experience with unemployment. Until the last quarter of 1977, the registered unemployment rate had not risen above one percent.[1] In the preceding twenty years it had averaged only 0.17 percent. However, a steady and rapid climb, which began in the mid-1970s, saw the unemployment rate rise to 3.8 percent by the end of 1981. The phenomenon of unemployment, which had been far from the minds of New Zealanders through the '50s, '60s and much of the '70s, had become, in the space of a few years, what the New Zealand Financial Review reported as "the public's prime concern".[2]

1. ESTABLISHING LIMITS

New Zealand's unemployment experience is also the prime concern of this thesis. A great deal has already been written on unemployment and much remains to be said. It would be quite impracticable to attempt to undertake research on such a topic, however, without first establishing boundaries to the enquiry. Our study of unemployment in New Zealand will be limited in three respects. First, we will impose a time constraint. The period 1960 to 1981 will be our focal point. This period was chosen for a number of reasons. First, the decade of the 1960s was the first post-war period that exhibited any substantial fluctuations in the level of unemployment. Second, the decade of the 1970s was the period in which the rapid and sustained rise in unemployment, leading to the current historically high levels, occured. Finally, 1981 is the year of the latest Census and therefore represents the year for which the most detailed information on unemployment is available.

The second limitation to be placed on our analysis concerns the type of data to be employed. It was decided, at the outset, that our enquiry be restricted to data collected by official bodies. Within the resources at our disposal, there was no opportunity to collect our own data, as desirable as that may have been. The cost of such data collection is well exemplified by the detailed research undertaken on unemployed women in Palmerston North by Shipley (1982). From the 750 households surveyed only 64 unemployed women were found. For our purposes, even if we had the same level of resources to undertake a similar survey, the resultant sample would be inadequate. Consequently this study only employs data from official sources - both published and unpublished.

The third limitation, concerns the choice of topics related to the issue of unemployment. The rapid rise in unemployment levels in nearly all Western economies has generated many volumes from concerned individuals on the nature, causes and consequences of the unemployment dilemma. The titles of some of these works include; How to Survive Unemployment, Through No Fault of Their Own, Out of Work, Out of Sight, The Workless State, and The Conscript Army. These titles give vent to the passions that can be aroused by our subject of unemployment. They also serve to suggest the variety of ways in which an analysis of the problem might be tackled. Our concern is, however, to approach the issue of unemployment from the perspective of the economist. Pigou (1913), in the introduction to his book on unemployment, wrote:

> It is thought by many that the attitude of economists in the face of obvious social evils is unduly contemplative; that conditions, which involve the misery of untold thousands and the withering of incalculable human promise, are for them no more than the theme for ingenious disquisitions, and the excuse for a number of scarcely comprehensible, formulae. Assuredly this is a mistaken view. The compelling motive that leads men to economic study is seldom a mere academic or scientific interest in the movements of the great wheel of wealth. It is rather the sense that, in the world of business and of labour, justice stands with biassed scales; that men, women and children stagger often into an abyss that might be fenced and guarded; that the lives of many are darker than they need be; that the wealth, on which western nations pride themselves, bears but a faded flower of welfare. In these things lives the impulse to economic investigation; and the removal, or at least the mitigation, of the evils they portray is the goal of the economist's search.

It is this tradition that our enquiry intends to follow. By implication, therefore, we are restricted to the use of the tools of the economist. Much of what has been said by non-economists on the subject of unemployment is important and of value but, by and large, will not enter into the current discussion. Unfortunately, even the narrowing of the bounds of our topic by choosing to follow the approach of the economist is insufficient to reduce the subject to manageable proportions. Further culling from the plethora of possible topics of interest to the economist is required.

2. THREE GUIDE-LINE QUESTIONS

To a large extent, the choice of what should be included in a study on unemployment might be considered arbitrary. However, in order to introduce some element of method into our choice, it was decided to pursue topics related to the following three questions. (a) Does New Zealand have an unemployment problem and what is its nature? (b) Is there a theoretical model which is capable of explaining New Zealand's observed unemployment pattern? (c) Is the theoretical model chosen supported by empirical tests in the New Zealand case?

Chapter 2 is devoted, almost exclusively, to answering the first question. The question itself needs to be asked because, even now, New Zealand's global unemployment rate is substantially less than that found in many other Western nations. The chapter focuses on the disaggregated unemployment data from New Zealand and compares this with similar data from seven other countries in an attempt to discover the particular problem areas associated with unemployment in New - Zealand. The choice of disaggregation resulted in a coverage of unemployment broken down by sex, age, duration, ethnicity, occupation, industry and region. In addition to fulfilling its stated objective, the research involved in this chapter is also able to provide a characterization of New Zealand's unemployment experience. It was considered crucial that any theory of unemployment, put forward to explain the phenomenon in New Zealand, should, at the very least, be able to account for the observed nature of unemployment at the disaggregated level.

3. A BRIEF REVIEW OF THE HISTORICAL DEVELOPMENT OF UNEMPLOYMENT THEORY

Attempts to explain unemployment in rigorous theoretical models have a long history. Perhaps the best known event in this history was the publication of Keynes' General Theory. Keynes chose to draw a distinction between "voluntary" unemployment, on the one hand and "involuntary" unemployment on the other. This distinction was the basis for his analysis of the causes of unemployment and for his formulations of the remedies. However the first use of the term "involuntary" unemployment occurs, according to Kahn (1976), in Pigou's book Unemployment to which we have previously referred. Pigou writes that "...unemployment clearly does not include all the idleness of wage earners, but only that part of it which is, from their point of view and, in their existing conditions at the time, involuntary". In a later volume Pigou (1933) wrote "... A man is only unemployed when he is both not employed and also desires to be employed ... The desire to be employed must be taken to mean desire to be employed at current rates of wages ...". Pigou, however, was considered by Keynes to have largely ignored his own definition of involuntary unemployment and to have written at length on the question of how much unemployment there will be"... when the conditions of full employment are satisfied" (Keynes 1967 p.275).

Keynes introduced his own definition of involuntary unemployment which was:

> Men are involuntary unemployed if, in the event of a small rise in the price of wage-goods relatively to the money-wage, both the aggregate supply of labour willing to work for the current money-wage and the aggregate demand for it at that wage would be greater than the existing volume of employment.
>
> (Keynes 1967 p.15)

The essence of this definition is that it is expressed in terms of demand and supply analysis and excludes the possibility of imperfections operating in the market. This omission was deliberate on Keynes' part as he wished to focus on the possibility of aggregate demand for goods and services being insufficient to attain full employment. It would have been inconvenient to include in his concept of involuntary unemployment any form of unemployment that resulted from a cause other than deficiency of demand.[3] Thus Keynes' real concern was with what has become known as demand-deficient or cyclical unemployment.

By the 1950s economists generally agreed that unemployment could be conceptually divided into three main categories: (1) frictional: unemployment that had been traditionally recognized as the unemployment prevailing at full employment; (2) cyclical: unemployment associated with inadequate aggregate demand of a Keynesian nature; and (3) structural: unemployment arising from the mismatch between unemployment and existing job vacancies. What they were unable to agree upon, however, was the relative contribution of each unemployment type to the total level of unemployment.

In the mid-1960s, this failure to agree on the relative importance of the various unemployment types in the overall unemployment situation, produced a significant debate over the issue of whether or not rising unemployment levels in the United States, from the late 1950s, had resulted from increases in structural or demand-deficient unemployment.[4] The weight of the evidence in the debate appeared to support the demand-deficient explanation (Brown 1983), however, no final conclusion had been reached when the works of Friedman (1968) and Phelps (1968) began to have a telling impact upon the direction that the theoretical and empirical endeavours concerned with the issue of unemployment were to take.

Friedman and Phelps challenged the accepted Keynesian position that if unemployment could be reduced by an expansion of aggregate demand then it was involuntary. They argued that there existed a natural rate of unemployment due to frictional and structural forces which could not be reduced in the long run through an expansion of demand without accelerating inflation. In this view, the reduction in unemployment below the natural rate achieved by an expansion of demand is purely a temporary phenomenon based on faulty expectations, because it is not sustained in the long run when workers adjust their expectations in the light of experience.

The effect of Friedman's and Phelps' works on many in the economics profession was to establish a definition of full employment as the rate coincident with a constant inflation. Thus, as Brown (1983) writes "...inflation, rather than the health of the labour market, became the yardstick for judging economic performance in the seventies." The co-existence of rising unemployment and spiralling inflation throughout much of the 1970s was seen as evidence in support of the propositions of Friedman and Phelps and led to the conclusion that the natural rate of unemployment had risen and was continuing to rise.

The ideas of Friedman and Phelps required a rigorous theoretical underpinning in order to explain why there was a short-run trade-off between unemployment and inflation, but no long-run trade-off. This was provided by the development of what has become known as the theory of job search.[5] Essentially the job-search model argues that a worker will compare the return from unemployment to the returns from alternative ways of spending time. On the basis of such a comparison he then decides whether or not to become unemployed. In this view of the world, unemployment is voluntary and the result of decisions taken on the supply side of the labour market.

Some search theorists accept that their theory is only capable of explaining that part of unemployment which would normally be termed frictional (e.g. Reder 1969). Others clearly believe that much of what previously would have been regarded as structural unemployment can also be explained in a search theoretic framework (see for example Barnes 1974). Although both groups of economists would agree that search theory cannot explain unemployment during the trough of the business cycle, their interpretation of the amount of unemployment that is consistent with the natural rate is such that they would argue that a great deal of the rise in unemployment in recent years is the result of increased search activity and not a reduction in demand. In the extreme case, economists such as Fisher (1976), deny the existence of demand-deficient unemployment and claim that all unemployment is the result of voluntary job-search.

4. FORMAT OF THE THESIS

Consequent upon the factors discussed in Section 3, it was decided to approach guide-line questions (b) and (c) solely in the context of job-search theory. This task is undertaken in Part 2 and Part 3 of the thesis.

Chapter 3, the first chapter of Part 2, reviews the theory of job-search and a simple diagramatic model is developed to incorporate the basic elements of search at the macro level. This model enables us to explain the short-run and long-run relationships between unemployment and inflation and, in addition, permits us to show that search theory can be used to explain the disaggregated breakdown of New Zealand's unemployment as described in Chapter 2. Chapter 3 also presents a review of the major criticisms of search so that, at the outset, we are aware of the theoretical weaknesses and the major alternatives. The alternatives, however, will not be pursued.

Possible tests of search theory are considered in Chapter 4. Two types of tests are discerned. First, there are tests of search as a viable explanation of the behaviour of individuals in the labour market. Second, and more important for our purposes, there are tests of search as an explanation for rises in the level of unemployment. The discussion in Chapter 3 allows us to immediately identify three tests of search. The first is a test of the assumption that the workers "asking" wage or "reservation" wage declines with the duration of his unemployment. If such a finding were made, it would be evidence of search-type behaviour in the labour market. The remaining two tests, derived from Chapter 3, are tests of search unemployment's contribution to increases in the level of unemployment. One test involves obtaining estimates of the various unemployment types in order to establish whether or not increased unemployment is associated with increases in structural or frictional unemployment, as predicted by search theory. The second test is to calculate estimates of the average duration of completed spells of unemployment to see if they concur with the implied (and at times explicit) assumption of search theorists that unemployment spells are typically of short duration.

Further tests of search are generated in Chapter 4 by extending the search model to incorporate an analysis of discouraged workers, the effect of unemployment benefits on both the level and duration of unemployment and the relationship between unemployment and vacancies. As a result, two further tests of search as a labour market phenomenon are proposed. The first, is to test the hypothesis that an increase in the number of "discouraged" workers will be directly related to a worsening in economic conditions. The second, is to test the prediction that higher levels of unemployment benefit will result in an extended duration of an individual's spell of unemployment. Related to this test, is the first of our two tests of search as an explanation for higher unemployment generated by the extensions to our theory in Chapter 4. This requires us to test the hypothesis that the unemployment rate is directly related to search subsidies of which unemployment benefit is perhaps the most important. Our final test of the search impact on unemployment is to estimate a relationship between unemployment and vacancies and to test for an outward shift in this relationship over time. Our theory leads us to conclude that a failure to find such a shift would be strong evidence against a rise in unemployment having been generated by increased search activity.

The final chapter of Part 2, Chapter 5, reviews the empirical literature relevant to the seven tests of search that we have identified. In this chapter, particular attention is paid to overseas attempts to establish a relationship between unemployment duration and the asking wage. This is because, in the New Zealand case, lack of suitable data prevents the issue from being examined. Although much of the research discussed in this chapter was not undertaken specifically as a test of search, the implications for search theory are apparent. In general, overseas research has produced considerable evidence in support of search activity as a viable labour market phenomenon and, not an inconsequential amount of evidence supporting the search theoretic hypothesis that increases in unemployment levels throughout the 1970s were, at least in part, the result of changed search activity.

Part 3 of the thesis applies six of the seven tests of search to data drawn from the New Zealand labour market. Chapter 6, the first chapter of Part 3, focuses on the problem of the discouraged worker. Because no official estimates of the number of discouraged workers are regularly provided in New Zealand,we are forced to calculate our own. Before this can be done, however, we must attempt to ascertain what the official unemployment data measure. Our enquiry leads us to conclude that unemployment in New Zealand is possibly underestimated because of measurement error. Unfortunately the nature of the data is such that this conclusion cannot be confirmed. Nevertheless, we attempt an adjustment of registered unemployment on the basis that Census unemployment more closely approximates true unemployment. Our adjusted data is then used to (a) test for a discouraged worker effect and (b) calculate a series for female discouraged workers. This information, in conjunction with the results of a 1981 survey of discouraged wokers, enables us to compare the New Zealand experience of discouraged workers with predictions generated by search theory.

Chapter 7 examines the concept of the duration of unemployment and notes that the concept of duration relevant to tests of search is the duration of a completed spell of unemployment. Because information on the duration of a completed spell of unemployment cannot be directly obtained from Department of Labour data, estimates are generated.

These estimates are compared with data from the Department of Social Welfare, where data on the duration of completed spells on unemployment benefit is available. In addition,Chapter 7 also examines the relatively new concept of experience weighted duration and the importance of multiple spells of unemployment as they affect conclusions that might be drawn from information on spell length alone.

The estimation of unemployment types is the subject of Chapter 8. The chapter uses registered unemployment and registered vacancy data to produce a series for each of demand-deficient unemployment, structural unemployment and frictional unemployment. Having calculated our estimates, we are then able to determine whether or not those categories of unemployment most closely associated with search, frictional unemployment and structural unemployment, have become more important, either absolutely or relatively, as unemployment has risen.

Registered unemployment and registered vacancy data are again utilized in our attempt to estimate a relationship between unemployment and vacancies in Chapter 9. This chapter also reports our tests for shifts in this relationship and our interpretation of the subsequent findings with respect to the theory of search.

The penultimate chapter, Chapter 10, reports our tests of the relationship between unemployment and unemployment benefits. In this chapter we consider the impact of changes in the level of benefit, relative to average income, on both the unemployment rate and the duration of a spell of unemployment for those eligible for benefits.

The major findings of our research are summarized in Chapter 11. Here, we bring together the results reported in previous chapters in order to assist us to draw a conclusion with respect to the relevance of search theory as an explanation of New Zealand's recent experience with unemployment. Also in this chapter, we present a number of policy proposals that arise from our findings and make some suggestions for future research.

NOTES

1. The registered unemployment rate is the ratio of registered unemployment to the estimated labour force expressed as a percentage.

2. See New Zealand Financial Review (1983, p.28).

3. In support of this statement readers are directed to the comments of Leijonhufvud (1963) who notes that Keynes definition of voluntary unemployment was extremely wide, that his own concern was entirely with the residual category of involuntary unemployment and that his policy recommendations and remarks refer specifically to the task of relieving involuntary unemployment.

4. See for example Gilpatrick (1965).

5. For a survey of the early work in this field see Lippman and McCall (1976a).

CHAPTER 2

SOME INTERNATIONAL COMPARISONS OF DISAGGREGATED UNEMPLOYMENT DATA[1]

1. INTRODUCTION

Unemployment rates in the industrialized capitalist countries increased substantially during the 1970s. New Zealand was no exception to this trend; in fact, given the relatively lower unemployment rates in New Zealand in the early 1970s, the increase in the rates in this country was far more spectacular than in many others. Nonetheless, New Zealand's total unemployment rate, however measured, is still below average for the OECD countries. But while this may give satisfaction to some, we cannot adequately compare the impact of unemployment in different societies without disaggregating total unemployment into its component rates. Unemployment is the result of complex interactions between such factors as working-age population, participation rates, and labour demand which in turn vary by industry, occupation, age, sex and ethnic group. The total unemployment in a nation is the total of the widely varying unemployment experienced by these population sub-groups. There is no reason to suppose that the differential impact of unemployment on these groups would be the same from one country to another and, it is even possible that countries with low global unemployment rates may have very high rates for certain sub-groups. In order to assess better New Zealand's unemployment experience it was decided to compare disaggregated unemployment rates with similar data (where it could be obtained) from seven other countries: Australia, Norway, the United Kingdom, the United States, Germany, the Netherlands and Israel.

The selection of such a set is inevitably fraught with difficulty because of the various criteria that one or another investigator may deem important. In selecting our list we have kept in mind three factors. First, the availability of suitable and reliable data to complete the coverage of the categories chosen for analyses. This proved a major consideration as data paucity severely limited our choice of countries. For example Ireland was excluded because eligibility rules for receipt of unemployment benefits meant that very few young unemployed enrolled; Denmark, Japan and Switzerland were excluded because no information was available on the duration of unemployment and Austria, Finland and France were excluded because of severe irreconcilable discontinuities in the unemployment data. Our second criteria was to choose countries which could be compared with New Zealand on the basis of certain socio-economic aspects. These included comparability of population, institutional arrangements, economic structure and educational, historical and cultural links. The last of these is, we believe, quite important. Countries with similar social structures are likely to adopt analogous attitudes toward unemployment, its definition, measurement and resolution and therefore, from the point of view of our study, enhance the probability of comparing like with like. Finally, we do not consider it unimportant to select countries in which New Zealanders have particular interest. The tendency is to compare New Zealand's economic performance with the major OECD countries. Consequently one aspect of this chapter is to highlight New Zealand's disaggregated unemployment experience with respect to those countries with which New Zealanders choose to compare themselves.

In general the difficulty of comparing unemployment rates accurately has tended to impede any review of unemployment at an international level. The results of a survey carried out by the OECD (1979) among twenty-three member countries indicates how divergent statistics on unemployment are. Although the New Zealand Department of Labour recently argued that "almost all countries have censuses" (Department of Labour 1979a) only twelve of the countries in the OECD study employed this method for gathering unemployment data. Of the countries we have chosen for our study only Australia, the UK, New Zealand and Germany publish unemployment statistics based on census data. Census data does not offer a good basis for international comparisons for a number of reasons. First, it is only under fortuitous circumstances that census dates between countries coincide. Second, censuses are undertaken at intervals ranging from five to ten years making comparisons of cyclical fluctuations in unemployment impossible. Finally the definition of unemployment used often differs between countries and within countries from one census to the next making consistency internationally impossible to obtain.

A large number of countries undertake labour force sample surveys but, again, there are considerable differences in the nature of this exercise from one country to the next. For example the period over which the data is collected ranges widely. In the case of countries such as Australia and the US, monthly surveys are made. The Netherlands, Germany and the UK, along with other EEC countries, have a biennial survey but do not publish an unemployment rate based on it. Norway undertakes a quarterly survey, while Israel's is produced on an annual basis. New Zealand, along with Switzerland, does not produce a survey of the labour force at all. Other difficulties with survey figures arise from the variations in the official definition of unemployed, inconsistencies in the criteria that must be met in each of the various countries in order to be classified as unemployed and the different techniques of data collection used in the actual survey.

Of the countries we have chosen for study all but two, the US and Israel, collect unemployment statistics on an administrative basis that counts all registered unemployed as opposed to only those in receipt of some form of unemployment benefit. Administrative data presents the best available data for comparing New Zealand's unemployment with that of the other countries selected, however, a number of difficulties do arise. For example, only Australia and Germany have the same age boundaries for inclusion in the count of unemployed as New Zealand. Other difficulties of interpretations arise from the varying incentive to register and from the job creation and manpower training subsidy schemes operating in the various countries which impact differently on population sub-groups. Nevertheless, because of the criteria used in selecting our seven countries for study, we believe that the problems outlined above will be minimized, and that we can still utilize the data to investigate the impact of unemployment at the disaggregate level.

The choice of Australia and Norway provides an opportunity to compare the registration method of collecting unemployment data with the more popular survey method. On the whole, Australian results from the alternative methods are similar - but not identical (Australian Industries Development Association, 1978). In Norway, on the other hand, registration data has, in the past, produced unemployment figures much lower than the survey count; although in recent years the difference has narrowed considerably the registration unemployment rate is still only about seventy-five percent of the survey rate. This compares with a ratio in excess of ninety percent in Australia. The lower coverage of Norway's registered unemployment figures is said to result from the failure of females to register - a problem that has also been evident in New Zealand. Comparison with Australia is also important because, although the Australian labour force is much larger than New Zealand's the economic structure is similar. Both countries have a highly efficient and well developed primary sector and a developing, if somewhat protected, secondary sector. This, in addition to their close proximity, suggests that fluctuations in the world economy are likely to have similar consequences for the nature of unemployment within the two countries.

In addition to collecting unemployment data on a registration basis, Norway was chosen because it has a population of similar size to that of New Zealand. Despite being restricted to survey data, Israel was also chosen because it had a similar population size and because of the importance of agriculture in that country's economy. As for Israel, the statistics for the USA are collected entirely by survey technique. However the nature of the survey, in each case, is similar to that used in Australia and therefore comparable. For current purposes the American data is particularly useful as it provides coverage of the racial distribution of unemployment and permits a revealing comparison on this issue with New Zealand census data.

Germany and the UK are included for two major reasons. First, they both collect unemployment data on the basis of registrations at unemployment offices as in New Zealand. Second, both are mature industrial countries with markedly different unemployment experiences. Examination of each, therefore, provides us with two different perspectives on the effects of an economic depression in a heavily industrialized work force. The final country for study, the

1. Standardized Unemployment Rates in Selected OECD Countries and Israel.[a,b]

	YEAR										
COUNTRY	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
United States	5.8	5.5	4.8	5.5	8.3	7.5	6.9	5.9	5.7	7.0	7.5
Japan	1.2	1.4	1.3	1.4	1.9	2.0	2.0	2.2	2.1	2.0	2.2
Germany	0.9*	0.8*	0.9*	1.6*	3.7*	3.7*	3.7*	3.5*	3.2*	3.1*	4.3*
France	2.6	2.7	2.6	2.8	4.1	4.4	4.7	5.2	5.9	6.3	7.6
United Kingdon	4.0*	4.2*	3.2*	3.1*	4.7*	6.1*	6.5*	6.4*	5.7*	7.3*	11.3*
Italy	5.3	6.3	6.2	5.3	5.8	6.6	7.0	7.1	7.5	7.4	8.3
Canada	6.1	6.2	5.5	5.3	6.9	7.1	8.0	8.3	7.4	7.5	7.5
Australia	1.9	2.6	2.3	2.6	4.8	4.7	5.6	6.2*	6.2	6.0	5.7
Austria	1.3	1.2	1.1	1.4	1.7	1.8	1.6	2.1	2.1	1.9	2.5
Belgium	2.2	2.7	2.8	3.1	5.1	6.6	7.5	8.1	8.4	9.0	10.9*
Finland	2.2	2.5	2.3	1.7	2.2	4.0	6.0	7.4	6.0	4.7	5.2
Netherlands	1.3*	2.2*	2.3*	2.8*	4.0*	4.3*	4.2*	4.2*	4.2*	4.9*	7.5*
Norway	1.5*	1.7	1.5	1.5	2.3	1.8	1.5	1.8	2.0	1.7	2.0
Spain	3.1*	3.1*	2.5*	2.6*	3.7*	4.7*	5.2*	6.9*	8.5*	11.2*	14.0*
Sweden	2.5	2.7	2.5	2.0	1.6	1.6	1.8	2.2	2.1	2.0	2.5
New Zealand[c]	0.3	0.5	0.2	0.1	0.4	0.4	0.7	1.8	2.0	2.2	3.6
Israel[d]	3.5	2.7	2.6	3.0	3.1	3.6	3.9	3.6	2.9	4.8	5.1
Average	2.7	2.9	2.6	2.7	3.8	4.2	4.5	4.9	4.8	5.2	6.3

[a] Per cent of total labour force

[b] Data for all countries, with the exception of New Zealand and Israel, have been adjusted, where possible, both to preserve comparability over time and to conform with the definitions drawn up by the International Labour Organization (ILO). Series adjusted by the OECD are marked by an asterisk (*). The data are averages of quarterly or monthly figures.

[c] Registration data.

[d] Labour force survey data.

Source: ILO (various); Central Bureau of Statistics (1982); OECD (1982a); Department of Statistics (various,a).

Netherlands, was chosen because unemployment data is collected on the basis of registrations at unemployment offices and because the Netherlands is a European country with an economic base similar to that of New Zealand.

The format of this chapter is as follows. Section 2 examines the breakdown of unemployment data by sex. This is followed in Section 3 by a consideration of unemployment by age group. A comparison of unemployment duration in our selected countries is the subject of Section 4. Section 5 looks briefly at the racial disadvantages in unemployment and compares, in particular, US survey data with data from the New Zealand Census. The occupational and industrial dimension of unemployment is the topic of Section 6. In Section 7 we examine the regional break-down of unemployment and in Section 8 we conclude.

Before proceding with our disaggregated analysis, however, we should first compare the relative performance of New Zealand and the seven countries at the aggregate level. The data for such a comparison is presented in Table 1. The table shows clearly how unemployment rates in the industrialised countries have risen since the early 1970 s. It will be seen that the UK and USA experienced above average unemployment rates throughout this period. Australia and the Netherlands have tended to have above average rates in recent years. Germany, Israel and Norway have all managed to stay below average. Norway has tended to have very low rates and its total level of unemployment has altered very little over the decade. New Zealand's experience is, of course, the most unusual with very low rates indeed until the mid-1970s with the rate increasing nine-fold between 1976 and 1981.

As we shall observe in later chapters part of the upsurge in unemployment in New Zealand has been attributed to a rising tendency for job seekers to register as unemployed. The same phenomenon is thought to have occured in Norway, where registration has been encouraged by the labour market authorities (OECD 1982b). However its impact on unemployment rates has been neglibible because of some unique advantages experienced by the Norwegian economy. Chief of these is the fact that Norway is the largest net energy exporter in the OECD area and therefore one of the few member countries which have been able to pursue an ambitious full-employment policy during the last decade. OECD estimates in 1977 suggested that in the absence of Norway's expansionary labour market measures, first introduced in 1975, unemployment would have been 40 percent higher. Indeed, the increased expenditure by local and central governments was estimated to account for as much as 70 percent of the increase in employment during this period (OECD 1977a).

2. Unemployment Rates by Sex

	COUNTRY																					
	Australia[a]		Australia[b]		Norway[a]		Norway[b]		UK[a]		USA[b]		New Zealand[a]		New Zealand[c]		Germany[a]		Netherlands[a]		Israel[b]	
YEAR	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
1971	1.5	1.6	1.3	3.1					4.6	1.5	5.3	6.9	0.3	0.2	1.14	1.33	0.7	1.1	1.7	1.3	3.1	4.2
1972	2.3	2.1	2.0	3.9	1.1	0.6	1.4	2.1	5.1	1.7	4.9	6.6	0.6	0.4	1.88	2.12	1.0	1.4	3.0	2.0	2.3	3.6
1973	1.7	1.8	1.6	3.6	0.8	0.6	1.0	2.4	3.6	1.2	4.1	6.0	0.2	0.2	1.40	1.85	1.0	1.5	2.9	2.5	2.4	3.2
1974	1.6	1.8	1.9	4.1	0.6	0.6	1.0	2.3	3.7	1.1	4.8	6.7	0.1	0.1	0.90	1.22	2.2	3.1	3.5	3.3	2.4	4.1
1975	5.1	5.3	3.8	7.0	1.1	1.1	1.9	2.9	5.5	2.1	7.9	9.3	0.4	0.4	1.49	1.99	4.3	5.4	5.0	5.0	2.5	4.4
1976	5.8	5.3	3.9	6.4	1.1	1.0	1.4	2.2	7.1	3.5	7.0	8.6	0.4	0.6	1.61	2.71	3.9	5.8	5.2	5.9	3.0	4.7
1977	7.0	5.8	4.6	7.5	0.9	0.9	1.0	2.2	7.4	4.4	6.2	8.2	0.5	0.8	1.45	2.56	3.7	6.0	4.6	6.6	2.9	5.1
1978	e	e	5.4	7.9	1.0	1.0	1.3	2.4	7.2	4.4	5.2	7.2	1.6	2.2	2.62	4.23	3.4	5.8	4.3[d]	7.5[d]	2.9	4.8
1979	e	e	5.2	8.2	1.4	1.1	1.6	2.4	6.7	4.3	5.1	6.8	1.8	2.4	2.82	4.38	2.9	5.2	4.1[d]	8.2[d]	2.4	3.8
1980	e	e	5.1	7.9	1.2	1.1	1.2	2.3	8.7	5.7	6.9	7.4	2.6	3.3	3.05	4.57	3.0	5.2	4.9[d]	8.9[d]	4.1	6.0
1981	e	e	4.8	7.4	1.5	2.0	1.4	2.8	13.6	8.0	7.4	7.9	3.4	4.2	3.55	5.53	4.6	6.9	8.2	11.4	4.3	6.3

[a] Registration data

[b] Labour Force Survey Data

[c] Unemployment rate calculated via method developed in Section 5.4 of Chapter 6. Unemployment figures are March estimates and the Labour force estimate used was the April figure.

[d] Beginning 1978 persons seeking work for 25 hours or more a week. Prior to 1978: 30 hours or more

[e] In April 1978 collection of statistics on registered unemployed persons was discontinued.

Source: Australian Bureau of Statistics (1975); Australian Bureau of Statistics (1976); Central Bureau of Statistics (1978); ILO (various); ILO (1982a); ILO (1982b); Department of Statistics (various a); and Table 3, Chapter 6.

The UK and USA, as net importers of energy, found maintaining employment very difficult during this period. This is no less true of Germany, however, here job creation schemes, vocational training and the introduction of short-term work contributed to the limitation of the rise in unemployment. Most important, however, was the outflow of foreign workers which is said to provide a buffer against unemployment in Germany (OECD 1978).

The rising trend in unemployment in the Netherlands is, it is argued, understated, because of the number of people absorbed by special employment and training who would otherwise be recorded as unemployed (OECD 1981a). However, the same criticism might be directed at most countries - including New Zealand. By and large, because such people are not without a job it seems proper to exclude them from the count of unemployed - even though they may often consider themselves as being unemployed.

2. THE SEX STRUCTURE OF UNEMPLOYMENT

Table 2 depicts the movement in unemployment rates for males and females, in the countries under study, from 1971 to 1981. For New Zealand, the official series for males and females move together through time and there appears to be little evidence of a substantial disparity between them. One noticeable feature, however, is the tendency for female unemployment rates to exceed male rates for the period after 1975. This may indicate that women become more prone to unemployment, or it could be that unemployed women become more inclined to register. The ineligibility of married women for the unemployment benefit has tended to reduce the incentive for them to register but the change in the Employment Service from an administrator of the "dole" to something approximating more closely an employment agency may have encouraged a greater number to do so and there is some evidence of this from the provisional 1981 Census results (Poot and Brosnan 1982).

Nontheless, the number unemployed is still understated by the registration data, and even the Census does not record "discouraged workers" among the unemployed. Several attempts have been made to measure "hidden unemployment" (Gallacher 1974, Walsh 1978, Braae and Gallacher 1983). In Chapter 6, we undertake our own adjustment of registration data to produce "census equivalent unemployment". The inclusion of that series into Table 2 changes the picture considerably. The female unemployment rate now lies well above that for males for all years throughout the 1970s suggesting that women's unemployment has been the relatively more severe (if unrecognized) problem throughout this period. (We will leave the discussion of the impact of discouraged workers until Chapter 6).

In each of the other countries of Table 2, unemployment in general has increased considerably throughout the 1970s and in all cases except Australia and the USA, the female rate has risen more rapidly than the male rate. Another way of looking at the increasing

3. Female Employment and Unemployment. (1981)

Country	Ratio of Female Employment to Total Employment (1) %	Ratio of Female Unemployment to Total Unemployment (2) %	(2) ÷ (1)
Australia	28.6	42.5	1.49
Norway	40.0	57.5	1.44
United Kingdom	40.1	37.0	0.92
USA	42.8	44.7	1.04
New Zealand	33.8	42.8	1.27
Germany	25.8	48.7	1.89
Netherlands	25.2	32.0	1.27
Israel	36.3	46.1	1.27

Source: Unpublished data, Central Bureau of Statistics, Norway; Unpublished data, Netherlands Central Bureau of Statistics; Australian Bureau of Statistics (various); Department of Employment (1982a); ILO (various); Department of Statistics (1982).

unemployment among women is to compare their share of unemployment with their share of employment. In the UK between 1970 and 1976, women's share of employment rose from 38 percent to 41 percent of employees in jobs; at the same time, female unemployment rose from 14 percent to 25 percent of total unemployment (Burghes 1977). By 1981 females represented 40.1 percent of employment but 37 percent of the total unemployed (Department of Employment 1982a). In New Zealand, Census figures show that, between 1971 and 1976, women's share of employment rose from 29.6 percent to 31.7 percent while their share of unemployment, although not increasing, remained at a level of about 45 percent. The Census data for 1981 shows that women's share of employment has risen to 33.8 percent but that their share in unemployment has fallen back to 42.8 percent.

The 1981 share of female unemployment is compared with the share of female employment, for all of the countries studied, in Table 3. Our previous evidence has suggested that female unemployment in New Zealand has been a relatively greater problem over the last decade than male unemployment. In this table we see that when women's share of employment is considered, the burden of unemployment has fallen more heavily on women in New Zealand than is the case in the UK and the USA. The Netherlands and Israel have performed as badly as New Zealand in this respect while Australia, Norway and Germany have performed marginally worse. One could speculate, however, that the New Zealand performance would have been considerably worse than that in other countries if the number of female hidden unemployed were taken into account.

In Australia, changes in the relative contribution of females to unemployment may result from changes in employment growth in specific industries. Mining, metal production and construction are predominantly male employers while the community service sector is an important employer of female labour (OECD 1982c). The growth of Australia's exports of mineral resources coupled with the Liberal-National Party Government's cuts in public expenditure may well have served to raise the female share in unemployment above the historical trend because of the resulting redistribution in the demand for labour. In Germany, the gap between the male and female unemployment rates has been maintained largely because of a continuing increase in female job-seekers looking for part-time jobs (OECD 1978). In New Zealand, part-time job hunters are excluded from the count of the registered unemployed. On the other hand, in the UK, the proportion of women unemployed has been increasing and would be much greater had it not been for various schemes, which have helped particularly ailing sectors employing a high proportion of female labour such as the textiles, clothing and footwear industries (OECD 1981b).

4. Youth and Total Unemployment by Sex

Country and Category	1976		1977		1978		1979		1980	
	M	F	M	F	M	F	M	F	M	F
Australia[b]										
Youth unemployment rate	13.7	17.7	16.6*	21.9*	16.1	16.8	14.4*	19.0*	14.5	18.6
Total unemployment rate	4.0	6.2	4.8*	7.5*	5.4	7.5	4.7*	7.4*	5.0	7.4
Youth unemployment as percentage of total unemployment	30.3	38.9	32.8	43.2	29.6	35.7	30.2	39.7	29.1	38.2
Youth labour force as percentage of total labour force	8.9	13.7	9.4*	14.9*	9.9	15.9	9.9*	15.5*	9.9	15.2
Norway[c]										
Youth unemployment rate	3.0	2.4	2.7	2.3	3.9	3.0	3.8	3.0	4.2	3.9
Total unemployment rate	1.0	1.0	0.8	0.9	1.4	1.1	1.2	1.0	1.3	1.2
Youth unemployment as percentage of total unemployment	16.3	18.5	18.2	19.9	14.7	18.0	16.0	18.9	17.5	21.0
Youth labour force as percentage of total labour force	5.4	7.3	5.4	7.2	5.3	6.9	5.1	6.4	5.3	6.6
UK[c]										
Youth unemployment rate	d	d	15.7*	15.0*	15.7*	15.1*	13.9*	13.1*	17.6*	16.2*
Total unemployment rate	7.1	3.5	6.7*	4.4*	6.8	4.6	6.3	4.4	7.2*	5.2*
Youth unemployment as percentage of total unemployment	d	d	17.8	39.8	17.9	37.7	17.5	34.3	19.0	34.7
Youth labour force as percentage of total labour force	d	d	7.6*	11.6*	7.7*	11.5*	7.9*	11.4*	7.8*	11.2*
USA[b]										
Youth unemployment rate	19.2	18.7	17.3	18.3	14.8	17.0	15.0	16.3	17.7[e]	
Total unemployment rate	7.0	8.6	6.3	8.2	5.0	7.1	4.9	6.8	7.1	
Youth unemployment as percentage of total unemployment	23.4	23.3	24.0	24.0	26.2	25.4	26.3	24.9	25.6	
Youth labour force as percentage of total labour force	8.6	10.8	8.7	10.7	8.9	10.7	8.6	10.4	9.2	
New Zealand[c]										
Youth unemployment rate	1.0	2.4	0.8*	2.1*	5.0*	8.1*	6.0*	8.9*	7.0*	10.0*
Total unemployment rate	0.3	0.6	0.2*	0.6*	1.7*	2.1*	1.6*	2.3*	2.0*	2.6*
Youth unemployment as percentage of total unemployment	36.8	68.9	39.4	69.9	39.8	67.8	38.3	65.8	35.3	64.1
Youth labour force as percentage of total labour force	10.0	18.5	9.9	17.9	10.0	17.5	10.0	17.0	10.0	16.6
Germany[c]										
Youth unemployment rate	3.2	5.6	3.2*	5.9*	2.7	5.4	1.7	4.0	2.4	4.7
Total unemployment rate	3.1	4.7	3.3*	5.2*	2.9	4.9	2.3	3.8	4.2	6.0
Youth unemployment as percentage of total unemployment	9.5	13.3	9.8	13.2	9.0	12.0	7.3	10.9	8.5	10.9
Youth labour force as percentage of total labour force	7.7	11.0	7.7*	10.8*	7.8	10.4	8.1	11.1	7.6	10.1
Netherlands[c]										
Youth unemployment rate	5.3*	4.6*	5.3	6.0	6.0*	8.1*	6.7	10.7	10.5*	13.8*
Total unemployment rate	4.3*	3.7*	4.0	4.0	3.7*	4.6*	3.6	5.0	4.3*	5.5*
Youth unemployment as percentage of total unemployment	7.5	22.4	7.2	22.1	7.6	22.4	7.5	23.2	8.3	23.2
Youth labour force as percentage of total labour force	6.1*	18.0*	5.4	14.8	4.7*	12.8*	4.1	11.0	3.5*	9.2*
Israel[b]										
Youth unemployment rate	10.1	9.5	10.9*	10.1*	10.3	10.1	8.3	7.7	13.4	13.1
Total unemployment rate	3.1	4.7	3.3*	5.2*	2.9	4.9	2.4	3.8	4.2	6.0
Youth unemployment as percentage of total unemployment	48.8	53.8	48.1	50.0	51.3	51.0	49.5	48.3	45.5	48.0
Youth labour force as percentage of total labour force	14.8	26.6	14.6*	25.7*	14.4*	25.0*	14.2	23.4	14.1	22.0

[a] Youth = under 20 (Under 21 for New Zealand and under 25 for Israel)
[b] Labour force survey data
[c] Registration data
[d] Not available
[e] Data for both sexes combined
* Labour force estimated from trends in official data

NOTE: Total unemployment rates differ from Table 2 because sources report information for different time period.

Source: ILO (various); Australian Bureau of Statistics (various); Central Statistical Office (various); United States Department of Labour (various); Office of Statistics

3. THE AGE STRUCTURE OF UNEMPLOYMENT

The age breakdown of unemployment, provided in Table 4, suggests that unemployment in New Zealand is largely confined to young workers. Clearly New Zealand is not alone in facing high and rising levels of youth unemployment. It can be seen that for each country there is a tendency for a wide gap to exist between the rate of youth unemployment and the rate of total unemployment. Demographic factors such as the changing age-distribution of the working population may account for part of this tendency, but it is far from a complete explanation.

During the period covered in Table 4, youth unemployment rates declined slightly in the US but continued rising in all other countries. By 1980, Australia and the UK were experiencing youth unemployment rates as high, or higher than the US and only Germany and Norway had youth unemployment rates below 10 percent. These recent developments marked a dramatic change from the years before 1976, during which the US youth unemployment rate was generally the highest amongst the countries compared.[2]

The relative performance with respect to youth unemployment is to some extent hidden if one focuses solely on the unemployment rates of the group concerned. For example youth unemployment rates have been lower in New Zealand than for any of the other countries, with the exceptions of Norway and Germany. This, perhaps is to be expected

5. Percentage Increase in the Labour Force of Selected Age - Sex Groups.

Country and Period	Men 25-44[a] Attributable to increase in population	Men 25-44[a] Attributable to change in participation	Men 25-44[a] Net Increase in labour force	Women 15-64[b] Attributable to increase in population	Women 15-64[b] Attributable to change in participation	Women 15-64[b] Net Increase in labour force	Total 15-24[c] Attributable to increase in population	Total 15-24[c] Attributable to change in participation	Total 15-24[c] Net Increase in labour force
Australia									
1971 - 75	10.5	1.5	12.1	8.2	1.7	10.0	8.9	0.5	9.4
1975 - 1980	9.9	-1.1	8.8	9.1	15.9	26.5	4.1	14.5	19.2
Norway									
1970 - 75	10.4	0.5	10.9	5.3	-	5.3	10.1[d]	-11.6[d]	-2.7[d]
1975 - 79	29.9	1.0	31.2	66.0	15.0	91.0	15.6[d]	-3.6[d]	11.4[d]
U.K.									
1971 - 75	6.2	-	6.2	0.4	1.6	2.0	-0.1	-2.8	-2.9
1975 -	e	e	e	e	e	e	e	e	e
U.S.A.									
1970 - 75	13.6	0.9	14.7	14.0	-9.0	3.8	24.5	8.7	35.3
1975 - 79	10.7	-0.2	10.5	0.9	37.0	38.3	-5.8	15.2	8.5
New Zealand									
1971 - 75	8.0	-0.1	7.9	7.8	1.6	9.7	12.2	-1.8	10.1
1975 - 81	14.1	-1.0	13.0	14.7	9.2	25.3	3.6	1.8	5.4
Germany									
1970 - 75	2.7	0.4	3.1	0.0	6.6	6.7	7.3	-6.3	0.5
1975 - 80	-3.9	-1.0	-4.9	2.4	2.4	4.9	11.6	-15.3	-5.5
Netherlands									
1971 - 75	13.3	0.5	13.8	5.5	-0.5	5.0	-1.0	-1.6	-2.6
1975 - 80	10.1	-2.4	7.4	7.4	17.0	25.6	7.6	-14.1	-7.5
Israel									
1970 - 75	27.2	3.8	32.1	-8.5	33.3	21.9	9.5	-14.4	-6.3
1975 - 80	20.5	-9.6	8.9	14.7	14.6	31.5	5.0	-4.2	0.6

[a] Norway 25 - 49
[b] Norway calculation based on all age groups in 1979
[c] Israel 14 - 24
[d] Estimated from data reported by ILO
[e] Data not published

NOTE: Figures in the first two columns of each group do not necessarily add to the figure in the third column of each group because of the combined effect of changes in population and participation rates on the labour force which has not been recorded here.

Source: ILO (various); Department of Statistics (1982); Australian Bureau of Statistics (various); Central Bureau of Statistics (1976).

given New Zealand's lower overall unemployment rate. More instructive is the proportion of total unemployed accounted for by the youth's contribution to the workforce. The youth unemployed generally account for a higher proportion of all unemployed (both in total and by sex) in New Zealand than for any of the other countries listed. In addition, although each country exhibits a higher proportion of both young males and females unemployed than the proportion each group represents in the workforce, the difference, particularly in the case of females, tends to be greater in New Zealand than in the other countries. For example, in 1980, female youth's contribution to unemployment in New Zealand was nearly four times their contribution to the workforce. The male youth contribution to unemployment was 3.5 times their contribution to the workforce. Only Norway, another country with low youth unemployment <u>rates</u>, comes close to this differential. Of the countries remaining, Germany, has by far the best performance. Youth's contribution to unemployment in Germany is only slightly above youth's contribution to the labour force.

A number of factors underlie international differences in youth unemployment rates (and also differences in the contribution of the sexes to unemployment). One of the most common explanations is couched in terms of changes in the labour force of the various groups concerned (Sorrentino 1981). Table 5 records changes in the labour force for three specific age-sex groups in each of the countries under study. The periods covered represent roughly the five year period prior to 1975 and the five year period after 1975. Also recorded are the estimated contributions to changes in the labour force made by changes in population and changes in participation. Changes in the population of a given working age are often cited as the cause of youth unemployment and changes in participation rates (amongst females) are often considered to be the most important contributing factor to female unemployment.

In general, increases in female participation rates have contributed more to increases in the number of women in the labour force than rises in the population. In addition much of the increase in the female labour force, in each country, has taken place after 1975. However, while New Zealand has exhibited the greatest increase in female unemployment over the period (on the basis of registered unemployment data) and while the divergence between the male and female unemployment rates (on the basis of "census equivalent" data) is as great as the other countries, the growth of the female labour force has been second lowest of the countries considered. Similarly, with respect to youth unemployment, New Zealand again has the most rapid increase in the unemployment rate but only the fourth highest increase in the labour force for this group in the second of the two periods. The Netherlands, which exhibits the biggest <u>decline</u> in youth labour force, has a male youth unemployment rate nearly twice that of New Zealand. Germany, on the other hand, has also experienced a large decline in the youth labour force, as a result of measures introduced by the Government (OECD 1977b), and this has almost certainly contributed to this country's extremely low levels of youth unemployment.[3]

The facts drawn out above are inconclusive. Clearly demographic factors and changing participation rates may have an impact on a particular group's unemployment but other factors are also important. These may include structural shifts in demand that cause a decline in the traditional "youth" industries, technological changes that eliminate the unskilled jobs normally taken by young workers, falling economy-wide growth rates and a narrowing differential between adult and youth wages.

4. UNEMPLOYMENT DURATION

Some economists dismiss short-term unemployment as a serious problem, arguing that it is "simply the manifestation of the efficient functioning of the allocative mechanism of the labour market: the healthy concomitant of the process of economic growth and change" (Newton 1975). This is all very well if you are not one of the unemployed but even if this stance were adopted, long-term unemployment with its serious social and psychological consequences cannot be dismissed in the same way; an apparent consequence of higher unemployment rates is that individual spells of unemployment are getting longer. Unfortunately, the only data available on duration

6. Share of Longer-term[a] Unemployment (Percentages)

Category	Australia 1976	1977	1978	1979	Norway 1976	1977	1978	1979	U.K. 1976	1977	1978	1979
Youths[b]	54.3[e]	f	54.9[e]	50.9[e]	7.7	5.3	5.7	6.2	29.7	31.1	31.7	29.3
Prime-age Workers[c]	30.4[e]	f	30.6[e]	35.9[e]	49.8	44.7	44.1	53.2	33.5	33.8	34.5	34.0
Older Workers[d]	15.3[e]	f	14.5[e]	12.1[e]	42.5	50.0	50.1	40.6	36.8	35.1	33.9	36.6
Females	44.4	44.8	42.7	45.5	39.0	42.2	45.6	38.5	18.3	23.6	26.5	27.5
Males	55.6	55.2	57.2	54.4	61.0	57.8	54.4	61.5	81.7	76.4	73.5	72.5
Unemployment Rate	4.8	5.7	6.3	6.2	1.8	1.5	1.8	2.0	5.1	5.5	5.5	5.5
Long-term Unemployment as a percentage of total unemployed	40.3	47.0	52.9	51.7	24.7	22.0	19.4	20.9	53.6	59.1	61.8	60.9

Category	USA 1976	1977	1978	1979	Germany 1976	1977	1978	1979	Netherlands 1976	1977	1978	1979
Youths[b]	34.0	34.4	36.4	35.2	19.7	22.9	19.8	17.5	31.5	31.2	33.6	35.4
Prime-age Workers[c]	38.1	39.1	38.3	40.6	44.9	45.1	43.8	41.4	51.8	51.2	50.0	49.3
Older Workers[d]	28.0	26.5	25.3	24.3	35.4	31.9	36.4	41.1	16.7	17.6	16.4	15.2
Females	39.6	41.4	41.9	39.7	51.2	53.9	55.7	58.2	20.6	25.4	30.9	34.6
Males	60.4	58.7	58.1	60.3	48.8	46.1	44.3	41.8	79.4	74.6	69.1	65.4
Unemployment Rate	7.5	6.9	5.9	5.7	4.1	4.0	3.8	3.3	4.6	4.5	4.5	4.6
Long-term Unemployment as a percentage of total unemployed	32.1	27.9	22.8	20.2	58.6	58.4	59.3	58.2	67.8	68.3	69.1	67.1

[a] Unemployment greater than three months
[b] Less than 25 years (Less than 20 in Norway)
[c] 25-45 years (Norway 20-49, Netherlands 24-49)
[d] Over 45 years (Norway and Netherlands over 49)
[e] Data are for total unemployment in the year
[f] Data not collected for Australia

Source: OECD (1980); Australian Bureau of Statistics (various).

of unemployment refer to the duration up to a specific date. The spells of unemployment recorded by these data are uncompleted since the persons concerned will presumably be unemployed beyond that date. There is no straight translation from these figures to the more illuminating ones of the duration of completed spells (see Chapter 7 for details). Nor does there even exist at present an agreed international definition of the duration of unemployment. Nontheless, the data on uncompleted spells (Table 6) shows that the proportion of people unemployed who are out of work for three months or longer (long-term unemployment) typically increases with the overall level of unemployment. An OECD report (Economic Outlook 1980a) argues that there may also be something of a ratchet effect in that, while duration falls along with unemployment, it does so to a lesser extent. That long-term unemployment is a problem for the countries currently under review is clearly evident in the table. It was estimated that long-term unemployment accounted, in mid-1979, for approximately 51.7 percent of the unemployed in Australia, 20.9 percent in Norway, 60.9 percent in the UK, 20.2 percent in the USA, 58.2 percent in Germany and 67.1 percent in the Netherlands.[4] New Zealand data are in Tables 7 and 8. From Table 7 we see that with 32.8 percent of unemployed counted as long-term, New Zealand was about average. However, Table 8 indicates that this share had risen from 15.9 percent which is the fastest for any of the coutries listed.

7. Share of Long-term Unemployment[a]: New Zealand April 1981 (Percentages)

	Male	Female	Total
Youths[b]	25.0	29.9	54.9
Prime-age Workers[c]	21.4	7.4	28.8
Older Workers[d]	12.1	4.2	16.3
Males			41.5
Females			58.5
Longer-term unemployed as a percent of total	19.2	13.6	32.8

[a] Unemployed greater than three months.

[b] 15-24 years.

[c] 25-39 years.

[d] Over 40 years.

Source: Department of Labour (1981a).

8. Share of Long-term Unemployment[a]: New Zealand 1976-1980 (December) (Percentages)

Year	Share
1976	15.9
1977	11.3
1978	30.9
1979	23.4
1980	26.1

[a] Unemployment greater than three months.

Source: Unpublished data, Department of Labour.

If we disaggregate further, we find that most typically older workers, once they become unemployed, are more inclined to be out-of-work for longer periods. Despite this, it turns out that, since young people experience the most unemployment, they do account for a large share of long-term unemployment - and, in Australia and New Zealand, over half the long-term unemployed are less than 25.

We might expect the statistics to underrepresent the degree of long-term unemployed among women since many married women who have been unemployed for long periods may abandon hope of finding work and drop-out of the pool of measured unemployed. When we look at the data, we do find that women are less inclined to be found among the long-term unemployed than in the total unemployed in the UK, USA and Norway, although not in Australia, Germany and the Netherlands. In New Zealand, women comprised 40.7 percent of the total unemployed at April 1981 and, as Table 7 shows, 41.5 percent of the long-term unemployed. The seriousness of long-term unemployment for women is heightened when we see in the table that most of this long-term female unemployment is accounted for by women aged less than 25. If, as we conjectured, many of the long-term unemployed older women become "discouraged workers" rather than remaining on the books as unemployed, the concentration of long-term unemployment among females may be much greater than the data indicate.

9. Unemployment by Age, Sex and Ethnicity: USA and New Zealand

Country and Category		Unemployment rate		Share of total unemployment (percent)		Share of total labour force (percent)	
		M	F	M	F	M	F
United States[a]							
White	16-19	13.5	14.4	10.1	9.4	4.5	4.0
	20-44	4.3	6.1	21.4	21.6	30.3	21.2
	45+	1.4	3.5	7.6	6.3	17.2	10.9
	Total	4.5	6.2	39.1	37.3	52.0	36.0
Black and Other							
	16-19	34.4	38.4	3.1	3.2	0.6	0.5
	20-44	10.4	12.7	6.7	7.8	3.9	3.7
	45+	2.8	5.3	1.6	1.3	1.9	1.5
	Total	10.9	13.1	11.3	12.3	6.3	5.7
New Zealand[b]							
Non-Polynesian							
	15-19	8.9	12.2	10.7	12.7	5.5	4.8
	20-44	2.8	3.4	21.9	13.9	35.4	18.4
	45+	1.9	1.6	7.3	2.7	17.9	7.5
	Total	3.1	4.3	39.9	29.2	58.8	30.7
Polynesian							
	15-19	29.6	42.6	7.1	7.4	1.1	0.8
	20-44	10.1	8.9	10.3	4.2	4.6	2.2
	45+	6.1	3.5	1.6	0.4	1.2	0.5
	Total	12.5	15.8	19.0	12.0	6.9	3.5

[a] 1978 Labour Force Survey Data

[b] 1981 Census Data (Preliminary)

Source: Department of Statistics (1982); Department of Commerce (various)

5. RACIAL DISADVANTAGE IN EMPLOYMENT

Burghes (1977) has noted that unemployment among racial minority groups is characterized by two outstanding features: their vulnerability in periods of rising and high unemployment and, at all levels of unemployment, the generally higher level of unemployment among the young and among women from racial minorities. Very few countries collect unemployment statistics by ethnic origin so that our study of this aspect on an international basis must, of necessity, be limited but fortunately for us, the country in which the racial disadvantage in unemployment is the most studied is the USA. Table 9 outlines the unemployment status of the USA civilian labour force for 1978. In each age and sex group the non-white unemployment rate exceeds the white unemployment rate; the total non-white unemployment rate, calculated at 11.9 percent, was well over double the white unemployment rate of 5.2 percent. The greatest discrepancy between the white and non-white unemployment rates is for youths aged 16-19. For males in this group, the non-white unemployment rate was 2.6 times greater than for whites in the same age bracket and for non-white teenage females, it was nearly 2.7 times greater. The disadvantage of being non-white in America is further highlighted by the fact that non-whites form only 12.1 percent of the workforce but account for 23.7 percent of the country's unemployment. Again young non-white women are the most disadvantaged; they comprise only 0.5 percent of the workforce but have 3.2 percent of the country's unemployment.

Statistics on unemployment by race in New Zealand are collected only at the time of the Census. The New Zealand data provided in Table 9 is based on information collected at the 1981 Census. The total Polynesian (Maori and Pacific Island Polynesian) unemployment rate, 13.6 percent, was nearly four times the non-Polynesian rate of 3.5 percent. The Polynesian population comprise 10.4 percent of the workforce but have 31 percent of the total unemployment. Polynesian women aged 15-19 have the highest unemployment rate of any group in either country and their share of unemployment in New zealand is over nine times their share of the New Zealand workforce.[5] On the basis of these data, it appears that non-whites are more greatly disadvantaged in New Zealand than in the USA.

There is also some evidence that racial disadvantage in New Zealand is more severe than in the UK. Preliminary results from the 1981 Labour Force Survey reported in Department of Employment (1982b) show that white unemployment in Great Britain was 9.2 percent compared with 16.7 percent for non-whites. In Great Britain non-whites represent 3.5 percent of the economically active but account for over 6.2 percent of the unemployed. Although bad, we have already noted that the situation is worse in New Zealand.

6. THE OCCUPATIONAL AND INDUSTRIAL DIMENSIONS OF UNEMPLOYMENT

The process of economic growth involves changes in technology which alter the output mix and, accordingly, the relative size of different industries and the demand for various occupational groups. If we add to this the cyclical and seasonal influences to which some industries and occupations are subject, it becomes apparent that an individual's probability of employment depends in no small measure upon the type of work performed and the industry in which it is performed. Burghes (1977) points out that, in the UK, the unskilled have always borne a disproportionate share of unemployment and quotes a Department of Employment study which found that in September of each of four selected years, 1959, 1963, 1968 and 1972, the main labouring occupations had consistently represented over 50 percent of total unemployment despite the change in total unemployment from just over 250,000 in 1959 to 650,000 in 1972. The 1971 General Household Survey in the UK indicated that 27 percent of the economically active population were classified as unskilled or semi-skilled manual workers; 42 percent of the unemployed in the same survey were in this category. At the other end of the scale, 44 percent of the economically active population were non-manual workers, this later group accounting for only 25 percent of the unemployed. Both skilled and supervisory workers had unemployment rates equal to their proportions of the economically active population. The substantial rise in

10. The Occupational Distribution of Unemployment (1980)

Occupational Group	Australia[a]		Norway[b]		USA[a]		New Zealand[b]		Israel[ac]	
	Percent of Unemployment in Group	Percent of Labour Force in Group	Percent of Unemployment in Group	Percent of Labour Force in Group	Percent of Unemployment in Group	Percent of Labour Force in Group	Percent of Unemployment in Group	Percent of Labour Force in Group	Percent of Unemployment in Group	Percent of Labour Force in Group
Professional, Technical and Related Workers	3.4	11.6	5.4	18.6	5.3	15.0	-	-	10.0	21.3
Administrative and Managerial Workers	1.4	3.4	0.5	4.9	3.6	10.5	-	-	1.1	3.6
Clerical and Related workers	6.9	17.1	6.1	10.7	13.5	17.8	9.9[d]	34.0[d]	17.9	17.8
Sales Workers	6.5	9.8	6.1	9.4	3.8	6.1	5.1	9.3	6.8	7.2
Service Workers	8.1	7.7	12.9	12.8	14.9	13.2	10.9	8.0	13.7	10.7
Agriculture, Animal Husbandry and Forestry Workers, Fishermen and Hunters	4.2	7.2	3.6	8.0	1.7	2.6	6.2	10.9	3.2	5.5
Production and Related Workers, Transport Equipment Operators and Labourers	29.7	33.6	48.6	33.2	45.8	32.0	46.2	33.9	43.7	29.7
Not Classifiable	21.0	5.2	16.8	0.7	-	0.8	6.2	3.1	3.7	1.7
First Job Seekers	18.8	4.4	-	1.7	11.4	2.0	15.4	0.8	-	2.5

[a] Labour Force Survey Data

[b] Registration Data

[c] 1979

[d] Including first two groups

Source: ILO (various); Department of Statistics (various a); Department of Statistics (1982).

unemployment since 1974 has not had the effect of reducing the percentage rate of unemployment for the unskilled even though other occupational groups have begun to experience higher levels of unemployment. General labourers still account for the largest proportion of registered unemployed and in December 1981 56.6 percent of the unemployed were found in manual occupations (Department of Employment 1982a).

When we look at the data for the other countries in 1980 (Table 10) it is clear that, in these as well, unemployment hits hardest amongst the less skilled and the least experienced.[6] In all cases, apart from Australia, workers in the occupations most closely associated with manufacturing (Production and Related Workers, Transport Equipment Operators and Labourers) account for a greater share of unemployment than of the workforce. In all of these countries, the group's share in total unemployment is approximately 1.4 times its share in the workforce. First-job seekers appear to fare even worse (except in Norway). In New Zealand first-job seekers' share in unemployment is 19.3 times their share in the workforce. This is by far the worst of the countries considered and no doubt reflects the fact that New zealand's unemployment problem is largely one of youth unemployment.

Perhaps even more illuminating of the disadvantaged position of the unemployed once out of a job is the number of job opportunities. The proxy for this is usually the unemployment/vacancy ratio.

11. Ratio of Registered Unemployment to Vacancies: New Zealand[a]

Classification	1970 Male	1970 Female	1975 Male	1975 Female	1978 Male	1978 Female	1981 Total
Non Manual[b]	0.2	0.1	1.9	3.0	10.8	13.1	20.6
Skilled Manual[c]	0.1	1.0	0.2	1.3	2.6	3.6	4.0
Semi-Skilled Manual[d]	1.7	4.6	6.7	8.9	14.3	17.5	9.2
Unskilled Manual[e]	1.8	0.1	10.1	4.0	28.6	22.1	22.8

Year and Sex

[a] June 1970-1978; December 1981.

[b] Non Manual = Professional, technical and related workers; Executive, Clerical and related workers; Shorthand-Typist/Typist/Office Machinist.

[c] Skilled Manual = Tradesmen

[d] Semi-Skilled Manual = Sales Workers; Farm Workers; Logging/Sawmilling Workers; Miners and Quarrymen; Seamen; Drivers/Cooks.

[e] Unskilled Manual = Storemen, Packers; Freezing Workers; Process Factory Workers; all Labourers.

Source: N.Z. Department of Labour, unpublished data; Department of Labour (1982a).

Burghes (1977, p.23) notes that in England, between 1959 and 1974 there was, at best, one vacancy for every four unemployed labourers. In September 1976, the ratio of unemployed "general labourers" to notified vacancies was 56 to 1. In these terms they were almost ten times worse off than all other occupational groups. By 1981 the picture had deteriorated greatly as the ratio stood at 341 to 1, (Department of Employment 1982b). Table 11 provides unemployment/ vacancy ratios in New Zealand for four skill classifications. Although these skill classifications are rather crude, it is clear from the table that the semi-skilled and unskilled of both sexes experience the greatest disadvantage in unemployment. It is interesting, however, that the ratio for the unskilled manual workers (male or female) never rises as high as the 341 to 1 reported in the UK although, for men, the unskilled manual labourers have been at least ten times worse off than the skilled manual workers - a figure similar to the one reported by Burghes. A recent change of importance in New Zealand, is the rise in the ratio of unemployment to vacancies for the non-manual group. This is due to a rise in the number of clerical staff looking for employment and the fall in the number of clerical jobs available.

If we were to turn our attention to the industrial structure of unemployment (Table 12), immediately apparent is the tendency in all countries considered for the construction industry to contribute more than proportionately to unemployment than to the workforce

12. The Industrial Distribution of Unemployment 1980.

Industrial Group	Australia[a] Percent of Unemployment in Group	Australia[a] Percent of Labour Force in Group	UK[b] Percent of Unemployment in Group	UK[b] Percent of Labour Force in Group
Agriculture	3.2	6.7	1.6	2.6
Mining and Quarrying	-	1.2	1.5	1.4
Manufacturing	16.8[f]	20.5[f]	26.6	29.4
Electricity Gas and Water	-	-	0.5	1.4
Construction	6.5	7.1	13.0	6.8
Wholesale and Retail	15.7[g]	18.4[g]	14.3	17.4
Transport and Storage	2.7	6.6	4.0	6.3
Finance	2.8	6.9	2.8	6.1
Community Services	11.4[h]	21.7[h]	13.7	28.6
Not Defined	21.6	6.5	14.9	-
First Job Seekers	19.4	4.4	7.1	-

Industrial Group	USA[a] Percent of Unemployment in Group	USA[a] Percent of Labour Force in Group	New Zealand[c] Percent of Unemployment in Group	New Zealand[c] Percent of Labour Force in Group
Agriculture	2.6	3.5	3.8	10.1
Mining and Quarrying	0.9	1.0	0.2	0.4
Manufacturing	26.4	22.5	11.6	24.0
Electricity Gas and Water	0.6	1.4	0.2	1.2
Construction	10.6	6.5	4.9	8.8
Wholesale and Retail	19.4	20.2	9.0	17.0
Transport and Storage	3.7	5.1	2.7	8.7
Finance	5.2	8.2	2.2	6.3
Community Services	19.4	30.9	9.7	20.7
Not Defined	-	-	55.9	2.7
First Job Seekers	11.4	0.8	-	-

Industrial Group	Germany[b] Percent of Unemployment in Group	Germany[b] Percent of Labour Force in Group	Israel[a] Percent of Unemployment in Group	Israel[a] Percent of Labour Force in Group
Agriculture	1.2	5.7	2.3	6.1
Mining and Quarrying	0.9	1.3	-	-
Manufacturing	27.8	34.1	26.3[i]	22.9[i]
Electricity Gas and Water	0.1	0.9	1.3	1.0
Construction	5.9	7.3	12.0	6.3
Wholesale and Retail	18.3	14.2	13.0	11.4
Transport and Storage	2.4	5.7	8.1	6.7
Finance	3.1	5.5	8.4	7.9
Community Services	17.4	22.5	27.3	34.4
Not Defined	15.7	0.6	1.3	0.8
First Job Seekers	7.2	0.2	-	2.5

[a] Labour Force Survey Data
[b] Registration Data
[c] 1976 Census Data
[d] Work Force = 1976
[e] Work Force = 1979
[f] Includes Electricity, Gas and Water
[g] Excludes Restaurants and Hotels
[h] Includes Restaurants and Hotels
[i] Includes Mining and Quarrying

Source: ILO (various); Department of Statistics (various); Department of Statistics (1976).

(except in Australia) and for tertiary sector classifications (e.g. finance and community services) to contribute relatively much less to unemployment than to the workforce.[7] Despite the difficulties of making comparisons between countries with different classification systems, it does not appear that the industrial breakdown of unemployment in New Zealand is vastly different to that being experienced in other countries. New Zealand's areas of concern, besides construction, are manufacturing and the wholesale and retail trade. The two last mentioned contributing particularly to female unemployment. Despite other dissimilarities, it is clear that certain industries and occupations are more prone to unemployment; wherever these are found they will inevitably be the major contributors to that country's unemployment. In the Netherlands, for example, the OECD reported that although the overall labour demand was clearly insufficient to absorb unemployment even in the absence of mismatches, better results could have been achieved if the historical trade-off between overall vacancies and unemployed still applied. The major problem being that the number of unfilled vacancies had been outrunning the number of unemployed in most occupational groupings of skilled industrial workers (OECD 1980b).

7. THE REGIONAL DIMENSION OF UNEMPLOYMENT

Behind New Zealand's national unemployment figures lie considerable regional differences. Thus at the 1981 Census when the national unemployment rate was 4.5 percent, Dunedin, Napier and Hastings had rates of just over 2.0 percent while the rate for Whangarei was 7.5 percent. The individual rates are themselves, of course, the outcome of the complex underlying patterns of change in factors such as participation rates, labour force and the process of job creation. When international comparisons are made, further complications arise relating to the differing definition of what comprises a region from one country to another. These problems not withstanding, some comment can be passed on the distribution of unemployment within New Zealand compared with the distribution of unemployment in other countries by examining the coefficient of variation across regions within the countries concerned.[8] The higher the value of the coefficient the greater the relative distribution of the unemployment measure in the country concerned. The coefficient of variation is calculated for all countries in our study except Israel (as the required data was not available) and the results are presented in Table 13.

13. Coefficient of Variation for Unemployment Rates in Regions

Country	Year	Regional Units	Coefficient of Variation %
Australia[a]	1976	States	13.8
	1981	"	15.8
Norway[b]	1979	Employment Office Region	47.8
United Kingdom[b]	1978	Standard Regions	31.0
	1981	"	24.2
USA[a]	1976		26.9
	1981		25.7
New Zealand[c]	1976	Employment Districts	40.7
	1981	"	34.7
Germany[b]	1976	Laender	18.1
	1981	"	22.6
Netherlands[b]	1976	Employment Districts	34.3
	1981	"	26.9

[a] Survey Data

[b] Registration Data

[c] Census Data

Source: Australian Bureau of Statistics (various); Department of Statistics (1976); Department of Statistics (1982); Central Statistical Office (various); Department of Employment (1982); Department of Commerce (various); Unpublished Data supplied by Statistisches Bundesamt, Germany; Unpublished Data supplied by Central Bureau of Statistics, Netherlands; OECD (1982b).

According to this measure, unemployment is relatively evenly distributed among the Australian states amd exceptionally unevenly distributed among New Zealand's Employment Districts and Norway's Employment Office Regions. The distribution of unemployment between the regions in the remaining countries lies somewhere between the two extremes. If it were true that the regional units and unemployment measurements chosen were compatible, the data would suggest that, in regional distribution, unemployment in New Zealand is generally less equitable than other countries considered. However it would be unwise to claim, without additional research, that the data is sufficiently compatible to allow this conclusion to be drawn.

In general, one would expect the coefficient of variation to decline as unemployment worsens. This is because during a nationwide recession all regions will be adversely affected. The data in Table 13 largely concurs with this prediction. Only in Australia and Germany has the coefficient increased, and both of these countries experienced very small increases in unemployment during the period. In the US and Norway, unemployment rates were also quite stable and in each case little or no change was experienced in the coefficient of variation.[9] The UK and the Netherlands, on the other hand, experienced large increases in unemployment and, as predicted, the coefficient of variation fell sharply. In New Zealand the coefficient also fell. However, given that

New Zealand had the greatest increase in unemployment over the period of any of the countries considered, it may have been expected that the decline in the coefficient of variation would have been greater. The fact that this was not the case lends additional support to our earlier conjecture that New Zealand is experiencing a less equitable distribution of unemployment than the other countries studied.

8. CONCLUSION

In this chapter we have looked at who and where are the unemployed. In particular we have seen how vulnerability to unemployment varies - striking particularly hard, in all countries, at those at the bottom of society. The less skilled form the highest proportion of the unemployed in most countries and New Zealand is no exception. This, in turn, means that those in the workforce who have not had access to education and training, the young, women and racial minorities, bear a disproportionate share of unemployment.

Although the global measure of unemployment for New Zealand suggests that this country has suffered less than most, the disaggregated unemployment data paint a quite different picture and the distribution of unemployment is often more inequitable than in the other countries used for comparison. The regional disparity appears greater than the other countries' data suggest. Futhermore, adult females and the young of both sexes bear a greater proportion of unemployment (when related to their share of the labour force) than in any of the other countries examined and more than half of long-term unemployment is borne in New Zealand by the young, especially young women. Racial disadvantage in employment, on the basis of the data that does exist, appears to be at least as severe in New Zealand as the USA and the UK and for young Maoris and other Polynesian women the situation is considerably worse.

Having determined that New Zealand does have an unemployment problem we turn, in the next chapter, to consider the theoretical explanation of unemployment. However, to be of relevance to the New Zealand situation, any proposed theory must be able to account for the disaggregated nature of unemployment as described in this chapter.

NOTES

1. Hicks and Brosnan (1982) is based on material presented in this chapter.

2. Data on youth unemployment was not available in a consistent and comparable form prior to 1976 for UK, Israel, and New Zealand. At the time of writing, 1981 data was unavailable. For an examination of youth unemployment prior to 1976 in some of the countries concerned see Sorrentino (1981).

3. Since official unemployment figures in Germany do not include school leavers searching for apprenticeships, actual youth unemployment will be greater than the official estimates. OECD (1978).

4. The Israeli Government does not produce data on the duration of unemployment.

5. If we were to take the Maori population separately we would find the Maori-Pakeha differentials to be even greater. See Poot and Brosnan (1982).

6. The UK, Germany and the Netherlands do not report data in a manner that can be readily incorporated into Table 10. However unpublished data received from Germany and the Netherlands supports the statement we have made.

7. Norway and the Netherlands were unable to provide data suitable for inclusion in Table 12.

8. The coefficient of variation (V) is used to compare the dispersion of two or more sets of data when the sets themselves are not equivalent. It provides a measure of relative dispersion and is given by the formula,

$$V = \frac{s}{\bar{X}}$$

where s is an estimate of the standard deviation and

$\bar{X}$ is the sample mean.

This measure has been used by a large number of economists investigating the spatial distribution of unemployment rates. See, for example, OECD (1982b), Burrows (1968), Bowers, Cheshire and Webb (1970) and Driehuis (1978). However Forer (1982) warns that the usefulness of the statistic rests crucially on the comparability of the regions chosen and the method by which the unemployment data has been collected.

9. Although no 1981 figure is quoted for Norway the OECD (1982b) report notes that the geographical dispersion of unemployment rates has shown no clear tendency to increase over time.

PART TWO

SEARCH THEORY AND UNEMPLOYMENT

Part Two outlines the simple search theoretic model demonstrating that unemployment resulting from voluntary search decisions could produce an unemployment pattern similar to that observed in New Zealand. The model is extended in order to identify possible tests of search and a survey of the literature pertinent to such tests is provided.

CHAPTER 3

SEARCH THEORY AS AN EXPLANATION OF UNEMPLOYMENT

1. INTRODUCTION

In the previous chapter we saw that New Zealand has a serious unemployment problem and that certain labour market groups are particularly badly affected. In this chapter we review what has become known as search theory, an important theoretical development of the last decade that purports to be able to explain much of the nature and cause of unemployment as it exists both in New Zealand and elsewhere. Other theories also make this claim, however it is the theory of job search that has commanded the attention of economists in recent years. Primarily this has been because the search theory of unemployment provides the micro-foundation for the short-run Phillips Curve, while at the same time being consistent with Friedman's long-run vertical Phillips Curve.

Our decision to focus primarily on search theory as an explanation of unemployment should not be regarded as an acceptance of the theory itself. Rather, it reflects the prominence of the theory in recent theoretical discussion. To many, even a casual glance at the evidence would indicate that there are some serious shortcomings inherent in the theory. For example, the search literature which predicts that unemployment is voluntary and the result of utility maximizing decisions on the part of workers, has been criticised on the grounds that the models in question strain reality by forcing all entry to unemployment through the mould of voluntary quit decisions with no real explanation for the real world phenomena of firings and layoffs. This criticism has resulted in the development of a number of additional theories, e.g. quasi-contract theory, the theory of layoffs and queue theory, all of which supplement rather than supplant search theory by introducing a greater degree of realism. Such theories, like search theory, are in the tradition of neoclassical (marginal) analysis. An alternative criticism has arisen from a group of economists who are making a conscious effort to break with this tradition. An increasing body of literature has developed in recent years around the concept of labour market segmentation and search theory has come under attack from this group. Segmented labour market theorists argue that the labour market is divided into (basically) two sectors, the primary (or good job) sector and the secondary (or bad job) sector. These writers have observed that the unemployed are concentrated in the secondary labour market and comprised of the disadvantaged groups identified in the previous chapter. Search by the unemployed in such markets is considered to be unproductive and the consequence of dissatisfaction rather than a rational quest for self-improvement.

The remainder of this chapter is constructed as follows. Section 2 reviews the models of the original proponents of the search theoretic approach. In this section a simple diagramatic model is developed which incorporates the basic elements of search at the macro level. Section 3 explains how search theory is able to provide a theoretical underpinning for the short-run Phillips Curve consistent with a long-run vertical trade-off. Search theory's contribution to the explanation of the pattern of disaggregated unemployment statistics is covered in Section 4. Section 5 presents the major criticisms of search, from both a neoclassical and institutionalist point of view, and Section 6 concludes.

2. SEARCH THEORY

2.1 Introduction

The basic premise of the search approach to unemployment is that, on the one hand, the unemployed individual actively seeks work while refraining from working at a job, and on the other, the labour-short employer actively seeks recruits while refraining from filling his existing vacancies. The development of this line of thought grew out of the work of economists in the early 1960's who began to view labour as a quasi-fixed factor of production and job search activity as a form of investment in human capital.[1] A quasi-fixed factor is defined as one whose total employment cost is partially variable and partially fixed. With respect to labour the fixed portion of employment expense refers to outlays by the employer on such items as recruitment and training costs. Once made, this expenditure becomes a sunk cost on which the employer will expect some return. Consequently during cyclical downturns an employer will be loath to dismiss workers in whom he has made a considerable investment but quite ready to dismiss workers in whom he has made little or no investment. Conversely, when attempting to fill vacancies, the employer will be prepared to take longer in filling a skilled vacancy than an unskilled vacancy because it pays the employer to invest in search for the worker who can most adequately fill the vacancy requiring the higher amount of skill.

Workers face the problem of how to acquire information on the wage rates, stability of employment, conditions of employment and other determinants of jobs for which they are applying. The worker is also faced with the problem of how to keep this information current. The decision to remain unemployed is based on the benefits and cost of searching for information on jobs. A worker will search for wage offers until the expected marginal return equals the marginal cost of search. The cost of unemployed search consists mainly of the wages paid by jobs he has turned down in deciding to continue looking for a job that will meet the minimum criteria that he has set. The benefit to search is the expected improvement in job offers over immediately available alternatives. Information about labour market alternatives is therefore a valuable asset that can be produced with input of one's own time (or purchased at a price).

It was these ideas that formed the basis of Friedman's (1968) and Phelps' (1968) challenge to the traditional Keynesian position that unemployment is involuntary whenever it can be reduced by raising the aggregate demand. They argued that there is a natural rate of unemployment due to frictional and structural forces. To quote Friedman -

> The natural rate of unemployment is the level that would be ground out by the Walrasian system of general equilibrium equations, provided there is imbedded in them the actual structural characteristics of the labour and commodity markets including market imperfections, stochastic variability in demands and supplies, the cost of gathering information about job vacancies and labour availabilities, the costs of mobility, and so on. (Friedman 1968 p.8)

This natural rate of unemployment is supposed not to be reducible in the long run by raising aggregate demand without an accelerating increase in the price level.[2] In this view the reduction in unemployment below the natural rate achieved by an expansion of demand is purely a temporary phenomenon based on faulty expectations, because it is not sustainable in the long run when workers adjust their expectations in the light of experience.

The role played by the concept of search in determining the level of the natural rate of unemployment was implicit in the writing of both writers.[3] Formal derivation of the role which search played in determining unemployment came only with the work of Reder (1969), McCall (1970), Phelps et. al (1970) and Gronau (1971).

2.2 Frictional Unemployment and the Theory of Search

In The General Theory Keynes was concerned with how to relate changes in the level of unemployment to changes in effective demand. However the question arises as to what level of the unemployment rate will be associated with a given level of demand for output. In particular what unemployment rate corresponds to a full employment level of output.

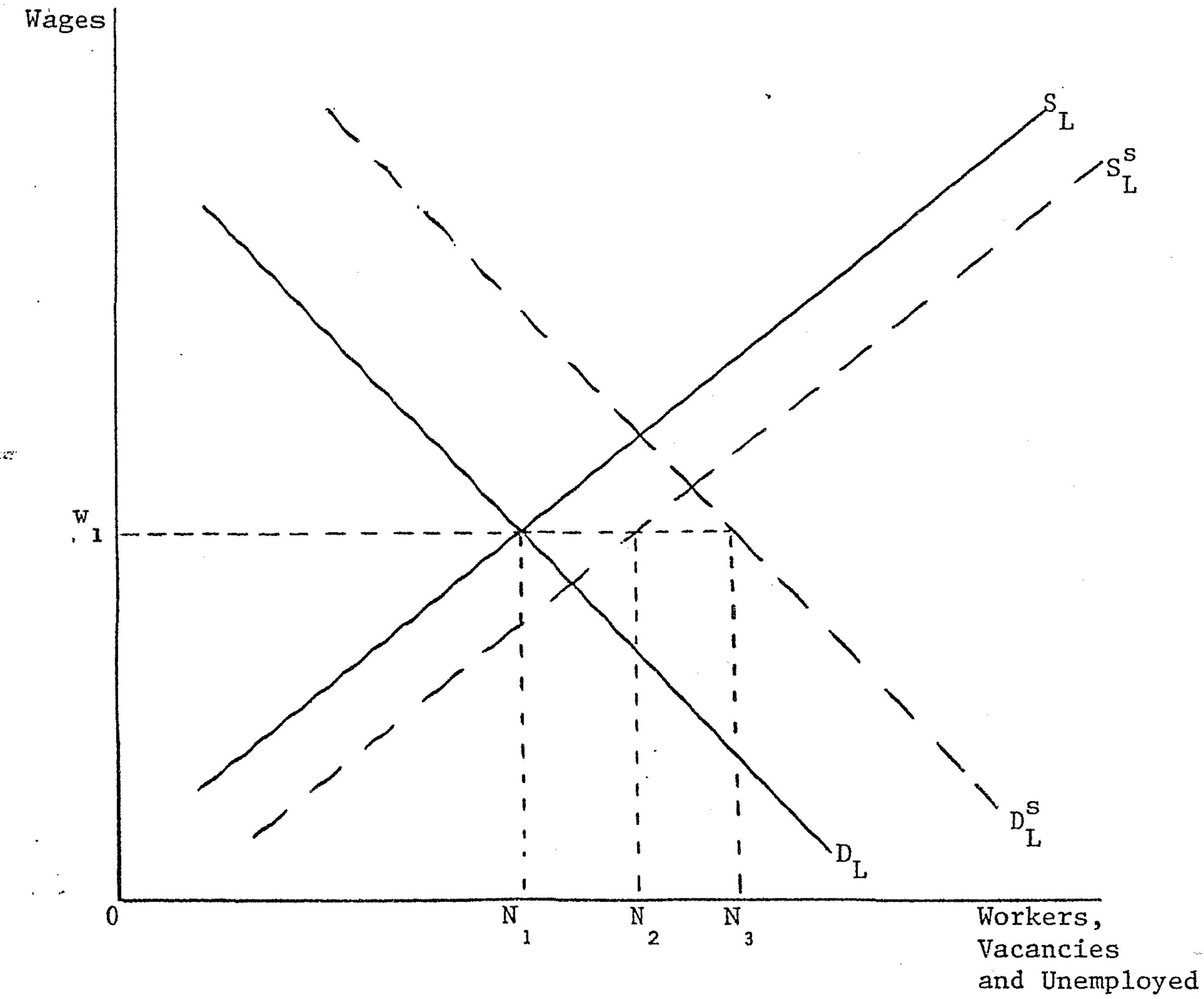
Reder (1969) addresses this question and expresses his analysis in terms of a neoclassical short-run model in which both workers and employers are maximizers of expected utility. A number of very restrictive assumptions characterize the model. For example, homogeneous wage rates and quality of labour are assumed to avoid the complications of a multi-market analysis. Reder's chief departure from the perfectly competitive case is the allowance made for the existence of search costs (to both employee and employer) arising from the assumption of imperfect information and the fact that the acquiring of information is not costless. If the worker knows the probability distribution of the utility levels associated with the job offered him after he becomes unemployed he would not accept the job, in the absence of waiting and searching cost, unless its associated utility were at least as great as the expected utility for all jobs. However, since waiting and searching costs do exist, he will accept some jobs even though their associated utility is less than the expected utility of all jobs. How far below the level of expected utility a job offer can fall before he will reject it depends upon the cost of waiting to the next "moment" when he can again consider a sample of alternative jobs. Reder terms the minimum utility a worker will require in order to accept a job at moment t_i, the job-acceptance level at t_i. The unemployed worker can influence the probability of him becoming employed in any period by altering his job-acceptance level. Thus a worker's choice of a job-acceptance level, given the job-utility distribution, implies choice of a mathematical expectation of the interval during which he will be unemployed. This Reder terms the expected-unemployment interval, I_e. Assuming uniqueness of the relation between the job-acceptance level and I_e, we may identify a worker's selection of a job-acceptance level as choice of a level I_e.

Assuming the job-acceptance level to be the same for all workers, it follows that I_e is also the same. In a labour market that is in repetitively stationary equilibrium, it can be shown, given a fixed labour turnover rate, that both the level of (frictional) unemployment and the unemployment rate are determined solely by I_e. Stationary equilibrium implies that

$$G_i = \alpha N, \qquad (2.1)$$

where N is the number of workers employed at t_i and α is the labour turnover rate such that $(0 \leq \alpha \leq 1)$. G_i therefore represents the number of employed workers newly placed into the pool of the unemployed.

FIGURE A. Reder's Search Theory Model



Thus

$$U_i = I_e G_i, \tag{2.2}$$

where U_i is the total number of workers unemployed at the moment t_i. Defining the unemployment percentage, $u_i = U_i/(N + U_i)$, substituting (2.1) and (2.2) into this expression and re-arranging terms we have

$$u_i = \alpha\, I_e/(\alpha\, I_e + 1) \tag{2.3}$$

In other words, given α, the unemployment percentage is determined, under stationary conditions, by I_e, the expected unemployment interval, and hence by the job acceptance level.

By an argument that is the precise analogue to the above, Reder demonstrates that

$$v_i = \beta J_e/(\beta J_e + 1) \tag{2.4}$$

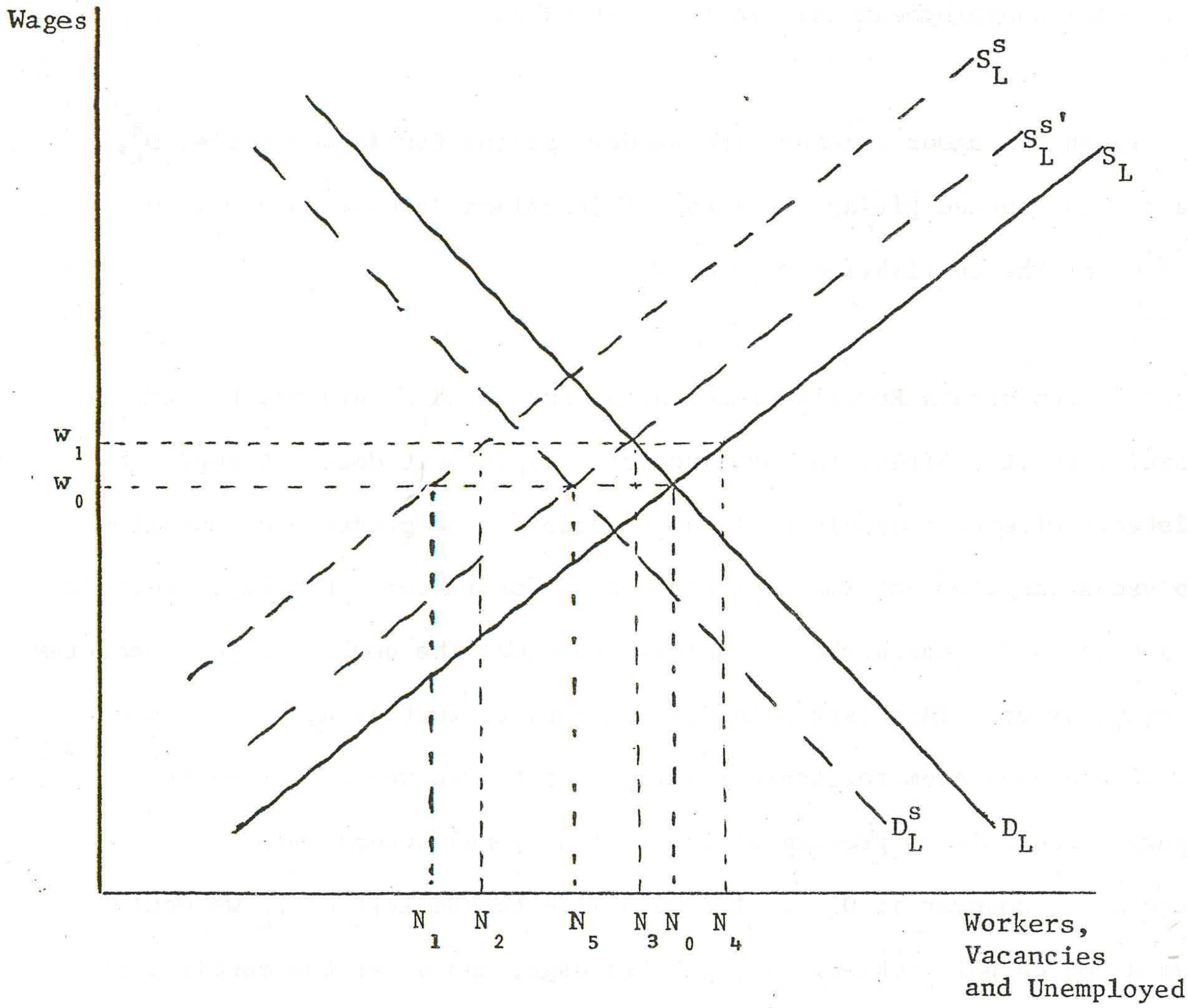
where $v_i = V_i/(N + V_i)$. V_i is the number of unfilled job vacancies; v_i is the job vacancy percentage and β is the fraction ($0 \leq \beta \leq 1$) of job vacancies newly placed into the unfilled category.

The implications of this analysis are more readily made apparent when it is expressed in diagramatic form. In Figure A the horizontal axis measures the number of workers, jobs, job offers, unfilled vacancies, unemployment, etc. The vertical axis measures the real wage rate. D_L and S_L "approximate" the conventional aggregate labour demand and supply curves. Equating D_L and S_L gives the equilibrium wage rate, w_1, and the (full) employment level, ON_1. However, in accordance with our previous analysis, there must, at this level of employment, be unemployment equal to $I_e(\alpha N)$ or $N_2 - N_1$ in the diagram. The curve S_L^s, which we shall call the shadow labour supply curve, is generated by adding to the equilibrium (full) employment level at each wage rate the amount of frictional unemployment existing at that wage.

By an analagous argument the shadow demand for labour curve, D_L^s, can be constructed giving an amount of frictional vacancies equal to $N_3 - N_1$ at the equilibrium wage of w_1.

Figure A represents Reder's presentation and three points may be made in relation to it. First, the presence of unemployment does not imply the existence of excess supply of labour. Second, the presence of unfilled job vacancies does not imply excess demand for labour. Finally, there is no necessity for the number unemployed to equal the number of job vacancies in equilibrium. This last point is contrary to what is normally assumed and indeed does seem to strain reality. As the curves are drawn in Figure A there is no problem as far as frictional unemployment is concerned. However if D_L^s cut the wage line to the left of S_L^s we would have a conceptual problem. If, at this wage, and under the conditions stated, all "frictions" were removed there would not be sufficient vacancies to absorb the unemployed. Can those who would miss out on gaining employment because of a lack of vacancies when all frictions are removed legitimately be referred to as frictionally unemployed? An analogous argument can be invoked to demonstrate the superficiality of

FIGURE B. An Alternative to Reder's Search Theory Model



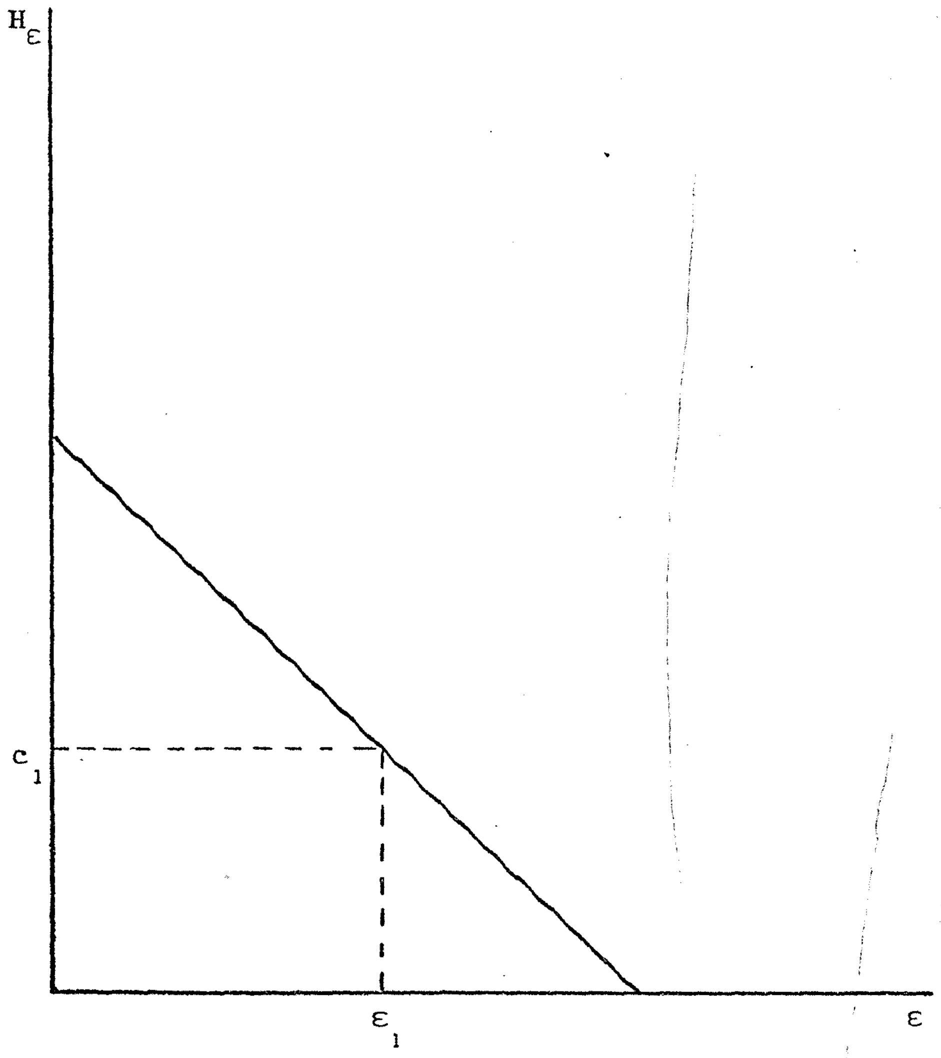
Reder's definition of frictional vacancies. As drawn, the diagram indicates that there would be insufficient workers to fill the existing vacancies if all frictions were removed.

It appears that Reder is attempting to define frictional unemployment as a purely supply phenomenon unrelated to the availability of suitable jobs which the frictionally unemployed could take. Similarly his concept of frictional vacancies focuses on the demand for workers and ignores their supply, In addition to the definitional problems outlined above, Reder's emphasis results in the theory predicting no change in the level of employment as frictions are removed. Since the removal of frictions represents an improvement in efficiency this should, in addition to reducing the recorded level of unemployment, lead to a rise in the overall level of employment. As the curves S_L and D_L remain fixed as frictions disappear the equilibrium level of employment remains stable at N_1.

In order to avoid the problems encountered with Reder's analysis we will assume in Figure B that S_L, given by employment plus unemployment, is the measured supply of labour curve and that D_L, equal to employment plus vacancies, is the measured demand for labour curve.[4] Under these conditions S_L will tell us, for any given wage rate, the number of workers that state they would be employed if demand was not a constraint and if frictions did not exist in the market. Similarly, D_L is a stated schedule of employment in the absence of frictions and supply constraints. However frictions do exist. We have already considered Reder's reasons for their existence and it is not necessary to expand upon these. In Figure B the presence of supply - side frictions is represented by the horizontal distance between S_L and S_L^s. S_L^s depicts the number of workers actually employed at each wage (as opposed to offering themselves for employment) if the demand for labour is not a constraint. Demand - side frictions are deflected in the horizontal distance between D_L and D_L^s where D_L^s represents the number of jobs filled (as opposed to the number of jobs offered) when supply conditions are not a constraint. The equilibrium market wage w_0 and employment level N_0 is now given by the intersection of S_L and D_L. This modification has three important outcomes. First, frictional unemployment, or more correctly non-demand-deficient unemployment, can be unambiguously defined.[5] In equilibrium non-demand-deficient unemployment is given by the distance $N_1 - N_0$ in Figure B. If the real wage were above the equilibrium wage, eg. at w_1, non-demand-deficient unemployment would be given by the distance $N_2 - N_3$ while $N_3 - N_4$ would represent demand-deficient unemployment. For situations in which the market wage is below the equilibrium wage all unemployment will be non-demand-deficient. Second, if frictions were reduced unemployment would fall and employment would rise. If supply-side frictions were reduced, by, for example, workers reducing their job-acceptance levels, S_L^s would move to $S_L^{s'}$ and employment at the equilibrium wage, W_0, would rise from N_1 to N_5. Finally, reductions in supply side frictions, beyond those that shift S_L^s to $S_L^{s'}$, will no longer result in a reduction of non-demand-deficient unemployment (and therefore an increase in employment) unless they are matched by reductions in frictions originating on the demand side. This third point is of major importance. Although under stationary conditions the job-acceptance level will be a major determinant of the distance between S_L^s and S_L, a reduction in the job-acceptance level, and hence a shift to the right of S_L^s, need no longer produce a reduction in the level of non-demand-deficient unemployment. Whether or not it does will depend on both the position and movement of D_L^s. Thus Reder's argument that it is the job acceptance level alone that determines the amount of frictional unemployment can now only be sustained if we assume no demand-side frictions, i.e. that $D_L = D_L^s$.

We have spent some time considering Reder's theory and the problems associated with it. This, however, has been of value because Reder was the first to provide a detailed analysis of the search process and the factors bearing upon an individual's decision to accept or reject a job offer. Our critique of Reder has also highlighted the need to consider frictions existing on both the supply and demand side of the market. Reder, in common with most search theorists, ignores the demand side restrictions when considering frictional (or search) unemployment. This leads to an overemphasis on the choice of the job-acceptance level as the main determinant of the level of frictional unemployment. A final problem with Reder's presentation of search theory is that the object of search is expressed in terms of the nebulous concept of job utility. This makes empirical verification of his work impossible.

FIGURE C. McCall's Search Theory Model



2.3 The Concept of the Acceptance Wage and Job Search

A major advance on Reder's theory, in that it provided for greater realism, was the shift in focus to the search activity of an individual worker who had become unemployed (McCall 1970). This avoided the problem of a multi-market analysis and also had the advantage of allowing the wage rate to be incorporated into the model as one of the major attributes to be considered by the worker when deciding if he should accept or reject a given job offer.

In the simplest version of McCall's model of job search the searcher is assumed to know both the distribution of wages for his particular skills and the cost of generating a job offer. Job offers are independent random selections from the distribution of wages. These offers occur periodically and are either accepted or rejected. The optimal policy for the job searcher is to reject all offers below a single critical number and to accept any offer above this critical number. The critical value, ε, of a job offer is thus chosen to equate the marginal cost of waiting with its expected marginal return. In Figure C the value, H_ε, on the vertical axis represents the equality between the marginal cost and the marginal return. The critical value of the job offer, ε, is the variable on the horixontal axis. As would be expected, and as McCall proves formally, ε and H_ε are inversely related. This in turn implies that, if other things are equal, as c, the marginal cost of search increases, the length of search decreases. Similarly, small values of c are associated with larger values of ε

and longer periods of search. In essence, this finding is the same as that of Reder. In terms of the diagram, the costs of search are largely determined by factors outside the influence of the worker. If the costs of search are equal to c_1, the individual will continue to seek employment until he receives an offer exceeding the corresponding value of ε_1. The time until such an offer is forthcoming is a period of frictional unemployment. Thus the expected length of frictional unemployment is an increasing function of ε.

2.4 More than Frictional Unemployment

The early search literature heralded the establishment of an "economics of disequilibrium" which was to include writings on the subjects of wage, price, job and production decisions under incomplete information. The volume compiled by Phelps *et al*. (1970) is regarded as the seminal work in the field but a complete review of its content would be misplaced here. Instead we will focus only on those papers, and portions of papers, that are directly relevant to the concept of search unemployment.

Alchian (1970) is the first to specifically link search unemployment with fluctuations in aggregate demand. He argues than an employee will not necessarily accept a pay cut to retain a job, even though some current wage income is better than none. An employee correctly and sensibly believes he can, with some search and evaluation of alternatives, get approximately his old wage at some other job. A decrease in general demand causes an increase in unemployment because more people will accept unemployment to engage in search, and each unemployed person will have to look longer. Wage earning opportunities will diminish in the sense that lower wages are available elsewhere. People use time to learn that the failure to find other equally good job options as quickly as they thought they would reflects diminished alternatives in general, not unlucky search. If the decrease in aggregate demand is a continuing affair, unemployment will persist at the higher level during the continuing decrease in demand, which must be continually discovered. The opposite also applies, an increase of aggregate demand will reduce search unemployment by causing some searchers to mistake a general rise of money wage rates for the discovery of a high, relative, money-wage offer; high enough that its acceptance is preferred to search for a higher one. As we shall see, this phenomena is important in explaining the Phillips Curve trade-off. Of immediate relevance, however, is that Alchian appears to extend the coverage of search unemployment to all measured unemployment thereby denying the existence of demand-deficient unemployment of a Keynesian type.[6] The policy implications of this are quite clear. If unemployment is voluntary no social disutility attaches to it as it merely reflects the optimum off the job search which utility maximizing workers voluntarily undertake in an economy which is implicitly assumed to be always at full employment. Phelps (1970a p.17), in his introduction to the volume draws out the policy implications of the Alchian contribution when he writes as follows:

> It would be as senselessly puritanical to wipe out unemployment as it would be to raise taxes in a depression. Today's unemployment is an investment in a better allocation of any given quantity of employed persons tomorrow; its opportunity cost, like any other investment, is present consumption.

Many of the other writers in the volume clearly support the contention that involuntary unemployment is unimportant. The model constructed by Lucas and Rapping (1970) virtually ignores the question of a deficiency in aggregate demand while nowhere in the volume is there a serious analysis of structural or demand-deficient unemployment. Phelps (1970b), Holt (1970a) and Mortensen (1970a) for example, were all largely concerned with demonstrating that demand management policies would not be effective in lowering the "natural" rate of unemployment in the long-run? This led Hines (1976, p.70), in his critique of the "new" micro-economics to conclude that:

> For these authors then, the economics of employment has come full-circle; Keynesian demand-deficient unemployment is out. We are as it were in a time machine, back in the world of the economic theorists of the 1920s and 1930s After all Hutt, Hicks, _et al_. all held the view that unemployment was voluntary. What we therefore have in this book is old but bad wine, albiet in elegant new bottles.

2.5 Unemployment Duration and the Acceptance Wage

An important factor in determining the path of the adjustment toward full employment is the impact of continued unemployment on the acceptance wage. Mortenson (1970a and 1970b) formulated his model on the assumption that the acceptance wage is independent of the length of time already spent searching for a job. This however overlooked the possibility that the asking wage will change through time as the unemployed worker adjusts his expectation of the wage rates that are likely to be available to him.

Both Alchian (1970) and Holt (1970a and 1970b) allowed for variations in the asking wage over time. Alchian accepted that if aggregate demand is held at a new lower level, workers will eventually realise that what they are seeking is unrealistic and make the appropriate adjustment. Holt (1970a) on the other hand, believing the wage aspirations of the individual to be set relative to the wages being received by others, allowed for a gradual adjustment of an individuals acceptance wage over the period of his unemployment if there had been a general movement in all wages during that time.

In his second paper, Holt (1970b) argued that he would expect the wage acceptance level of the worker to decrease with increasing duration of unemployment. He attributed this to three factors.
(a) His Baysian estimate of the probability distribution of his personal opportunities becomes gradually less diffuse as he obtains more knowledge from his search, and the upper tail of his subjective

distribution is pulled down toward the mean. (b) His search proceeds from more promising areas of search to successively less promising ones whose average wage is lower. (c) His psychic and financial costs of search, per period of time, increase as he depletes his financial and emotional resources and the range of his search is extended.

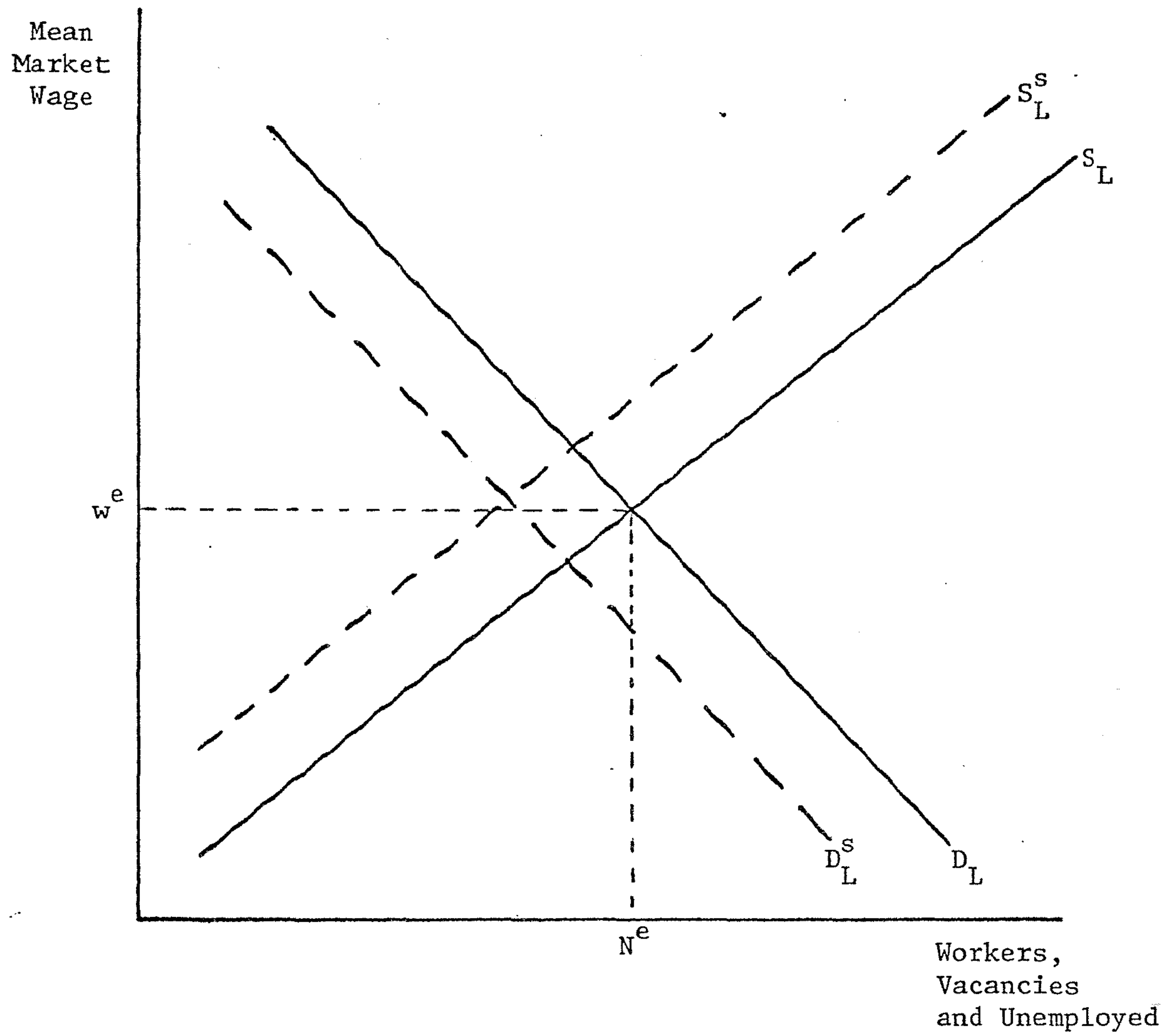
Gronau (1971) also considered the question of the wage acceptance level changing over time and argues that such changes could be attributed to two factors (a) changes that occur as part of the optimum search strategy, and (b) changes that result from a modification of the optimum strategy. Ignoring (b) he demonstrated, with respect to (a), that the asking wage would decline because of the finite time period with which the searcher was confronted. The job seeker's time horizon depends on the time he expects to stay on his next job. A job seeker embarking on search may expect to stay on his next job until a specified date or, alternatively, for a specified length of time. With respect to the first assumption, any prolongation of search will cut directly into the time spent on the next job. With respect to the second assumption, the length of search does not affect the duration of employment on the next job, but, given the finite life span, will necessarily affect the time spent on some subsequent jobs. In either case, the expected gains from search are reduced by the prolongation of search and consequently results in a lowering of the acceptance wage. Gronau recognized three additional factors that would result in a reduction of the acceptance wage: (a) The job seeker's chances of obtaining a new job depend, to a large extent, on the job-offer stream. The job seeker's demands decrease, therefore, with the reduction in the rate of arrival of jobs. (b) The higher the personal rate of discount, the lower the present value of any possible gains to be reaped by search, and, hence, the greater the urgency of getting a job fast. (c) The greater the renumeration for seniority and on-the-job training, the greater the foregone earnings associated with continuing search, and, hence, the greater the worker's tendency to accept lower wage offers at any point of time.

2.6 A Diagramatic Representation of Search

We have seen in the previous section that the search theoretic argument permits unemployed workers to adjust their reservation wages, rather than withdraw from the labour force, when they discover that their initial expectations were unrealistic. By an analogous argument, we could also conceive that employers making unrealistic offers would alter the wage rather than withdraw the job offer. In constructing a simple macro model of job search we will make use of this hypothesised flexibility.

In section 2.2 we presented and then modified Reder's diagramatic representation of the search theory model. One of the assumptions of this model was the existence of a homogeneous wage rate. Jobs differed only in terms of the non-wage utility they offered to workers. We concluded that this assumption was somewhat restrictive and introduced the work of a number of economists whose search models were expressed in terms of a distribution of wages in the market. However

FIGURE D. A Macro Representation of the Search Model



we do not wish to discard the diagramatic representation of search as depicted in Figure B and will therefore endeavour in the following to incorporate into this model the important concept of a probability distribution of wage rates.

Assume, in Figure D, that the horizontal axis is as before, units representing workers, vacancies and unemployed, and that the vertical axis represents the mean market wage about which actual market wages are distributed. Labour supply and demand curves, related to mean wage rates, can be drawn in as S_L and D_L. Such a procedure is not unusual and is generally implied whenever macro supply and demand curves are constructed. S_L tells us how many workers are attracted into the market by a given mean wage. D_L tells us how many workers employers wish to employ at a given mean wage.[8] For equilibrium to be attained (at a mean market wage of w^e and employment of N^e) three conditions must be met. First, the distribution of wage offers about the mean market wage must exactly equal the distribution of reservation wages. Second, there must be perfect knowledge of each distribution on both sides of the market, and third employers and employees can be appropriately matched instantaneously.

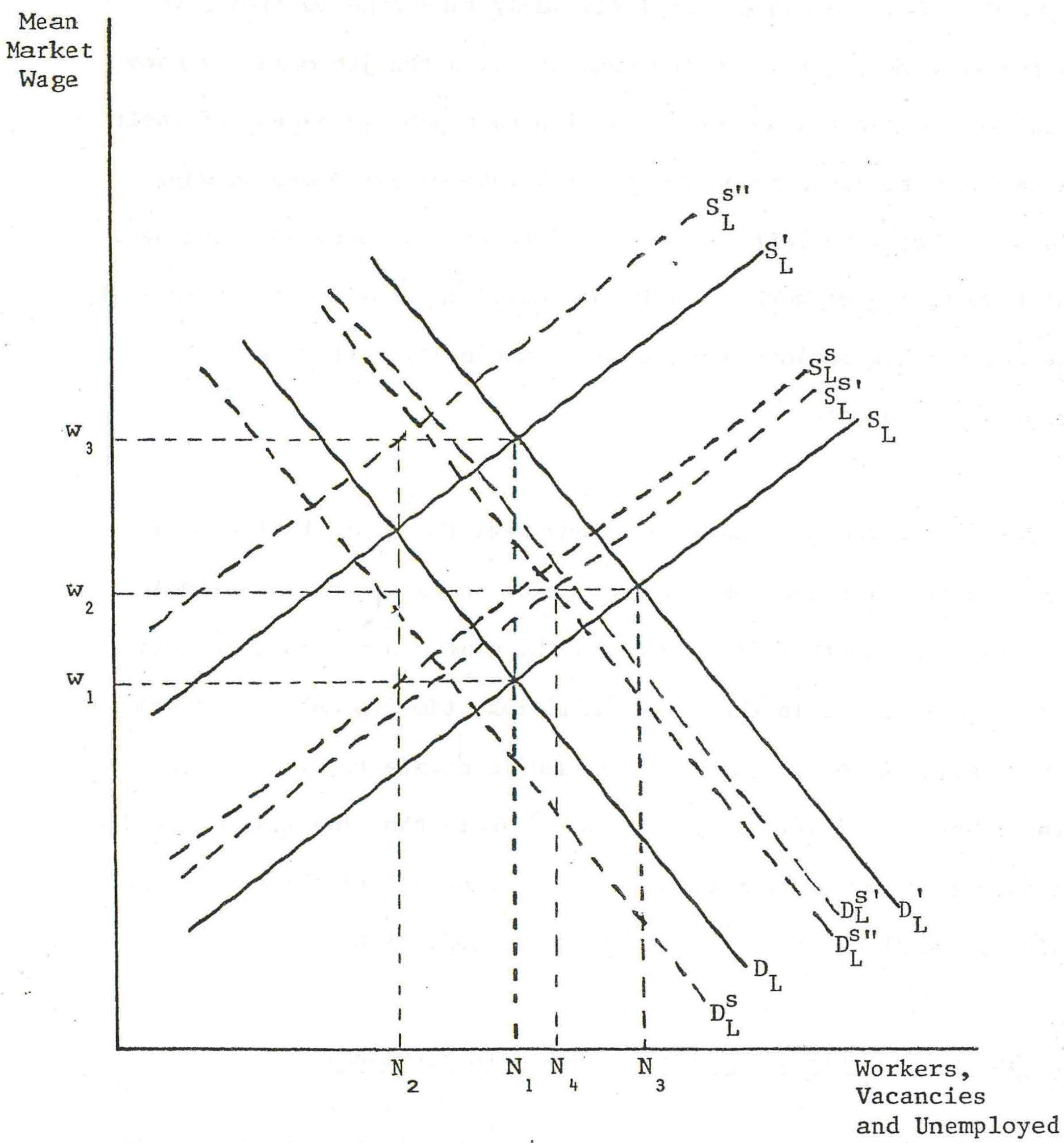
The fact that these conditions are not met enables us to reconstruct the curves S_L^s and D_L^s with a meaning analogous to their previous interpretation. In the first instance, we assume that the distribution of the wage offers matches the distribution of the reservation wages and that these distributions are known. S_L^s will then lie to the left of S_L because individuals will take time to search out a job offer equal to or greater than their reservation wage. D_L^s will lie to the left of D_L because employers will similarly take time to find a worker prepared to work at or below the wage at which the job offer is made. In addition, because some workers will accept jobs in excess of their reservation wage and some employees will take on employees at wages below what they were initially prepared to offer, there will not be a complete matching of workers with jobs until the reservation prices of those workers and employers whose plans are being frustrated are appropriately adjusted.

We may now discard the assumptions that the distribution of job offers and the distribution of reservation wages, found at any mean market wage, are both fully known and the same. Under these circumstances participants in the market will take time to collect information on the distribution relevant to them and to change their asking price in the light of the information gained.[9] Both the time taken to collect data and the delay in responding to it provide additional reasons for drawing S_L^s to the left of S_L and D_L^s to the left of D_L.

3. THE PHILLIPS CURVE AND THE NATURAL RATE HYPOTHESIS

A number of the exponents of search theory as an explanation of unemployment have constructed their models in a manner which enables them to establish a "long run" natural rate of unemployment while at the same time permitting a temporary trade-off between inflation and

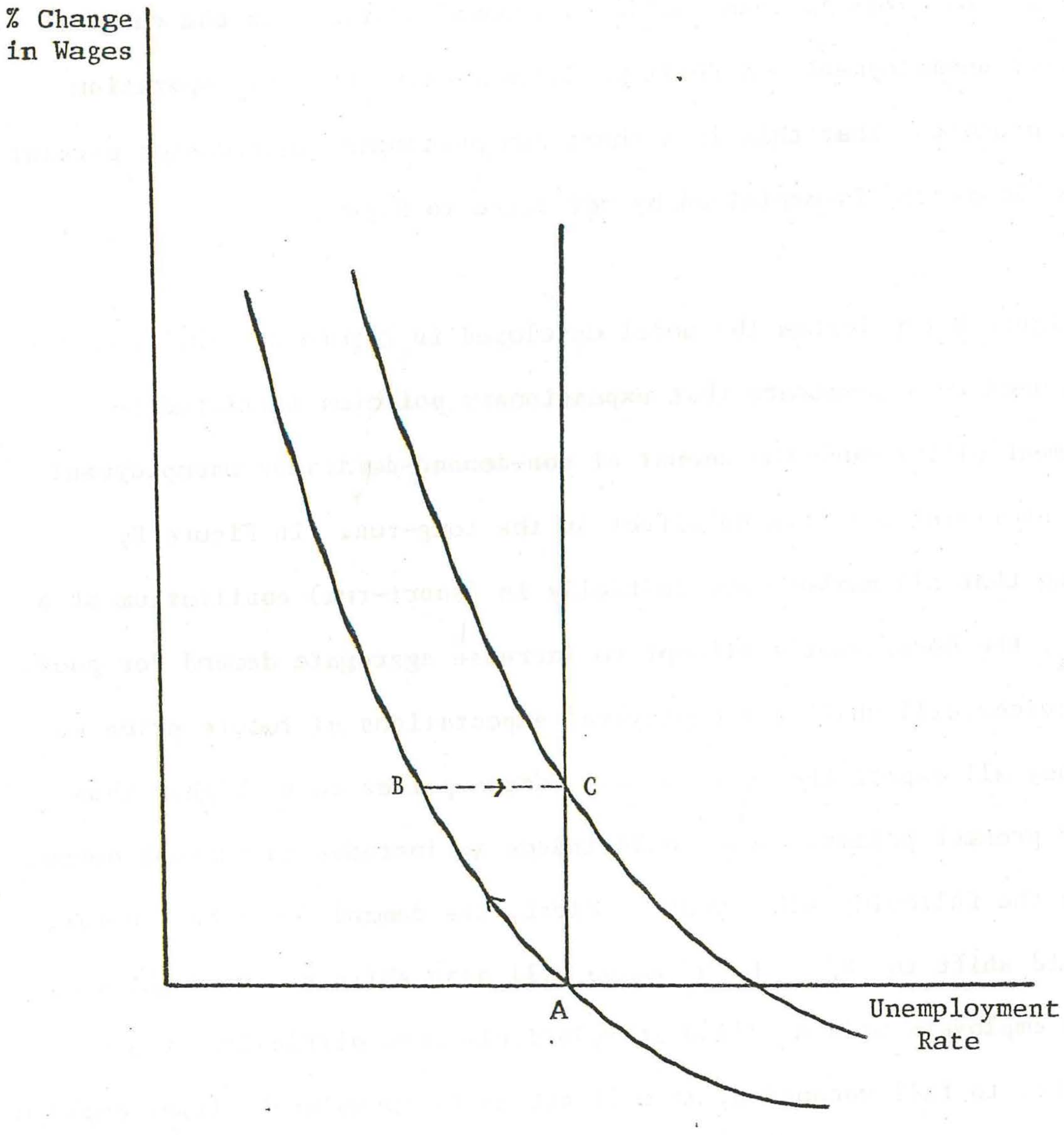
FIGURE E. A Search Theoretic Explanation of the Natural Rate Hypothesis



unemployment.[10] In the "short-run", if there is a general increase in demand, a firm will lower the skill requirements attached to vacancies and attempt to raise its wage offer relative to all others in the market in order to attract labour at a more rapid rate. Thus a wage inflation will be associated with a general lowering of minimum skill requirements. This in turn implies a general decrease in the duration of search unemployment. A Phillips Curve results from the operation of the process. That this is a short run phenomenon that cannot persist in the "long-run" is explained by reference to Figure E.

Figure E replicates the model developed in Figure D. This model can be used to demonstrate that expansionary policies initiated by government will reduce the amount of non-demand-deficient unemployment in the short-run but have no effect in the long-run. In Figure E, assuming that all markets are initially in (short-run) equilibrium at a wage w_1, the Government's attempt to increase aggregate demand for goods and services will shift the employers' expectations of future price so that they all expect the level of all future prices to be higher than that of present prices. This would induce an increase in current output through the following adjustments. First, the demand for labour curve, D_L, would shift to D_L'. The D_L^S curve will also shift to the right but, because employers will now find it relatively more difficult, at each wage rate, to fill vacancies, it will not shift by as much. (i.e. employers now expect vacancies to take longer to fill consequently D_L^S will lie farther from D_L' than D_L^S did from D_L.

FIGURE F. Derivation of the Vertical Phillip's Curve



A new mean wage of w_2 will be established in the market at equilibrium and workers, now that wages in general have risen, will not need to search as long as previously was the case before finding a job that is acceptable to them. Consequently S_L^s will move closer to S_L (to $S_L^{s'}$ for example). In the new, short-run, equilibrium non-demand-deficient unemployment will probably be less than before. In our example it falls from $N_2 - N_1$ to $N_4 - N_3$.

The new equilibrium will persist only if we assume that the workers supply curve reflects worker expectation of constant prices. If workers also came to expect price increases, which is reasonable, the supply curve will shift from S_L to S_L'. Since workers now realize that real wages in general have not increased they will find that they have to search as long as was originally required to obtain a given real wage. This will be reflected by a movement of $S_L^{s'}$ to $S_L^{s''}$. At the new equilibrium wage of w_3 the level of non-demand-deficient unemployment will again be $N_2 - N_1$ as it was when the equilibrium wage was w_1.[12]

In the terms of the Phillips Curve the interplay of these forces can be seen in Figure F. Commencing at point A an increase in aggregate demand causes fewer workers to quit in order to embark on search and encourages those in the process of search to accept jobs. The economy thus moves along the Phillips Curve towards B. With the passage of time, however, labour realizes that in fact its real wage has fallen. This will cause more people to quit their jobs and join the ranks of the frictionally unemployed to search for jobs with better real wages, and they stay there longer because jobs with higher real wages are not easy to find. Thus unemployment returns to its original level and the long-run Phillips Curve is vertical.

4. SEARCH AND DISAGGREGATED UNEMPLOYMENT STATISTICS

4.1 Introduction

In Chapter 2 we compared New Zealand's unemployment with unemployment in a selection of other countries. The chapter analysed unemployment in terms of its disaggregated nature. The general conclusion was that although New Zealand's global rates were comparatively low, specific areas exhibited problems as bad, if not worse than, those encountered elsewhere. In the countries examined the less skilled suffered the worst. In addition, the rural dweller, the young, women and non-whites were hit particularly hard as unemployment rose. In this section we attempt to show how search theorists would explain the distribution of unemployment.

4.2 The Geographical Dimension of Unemployment

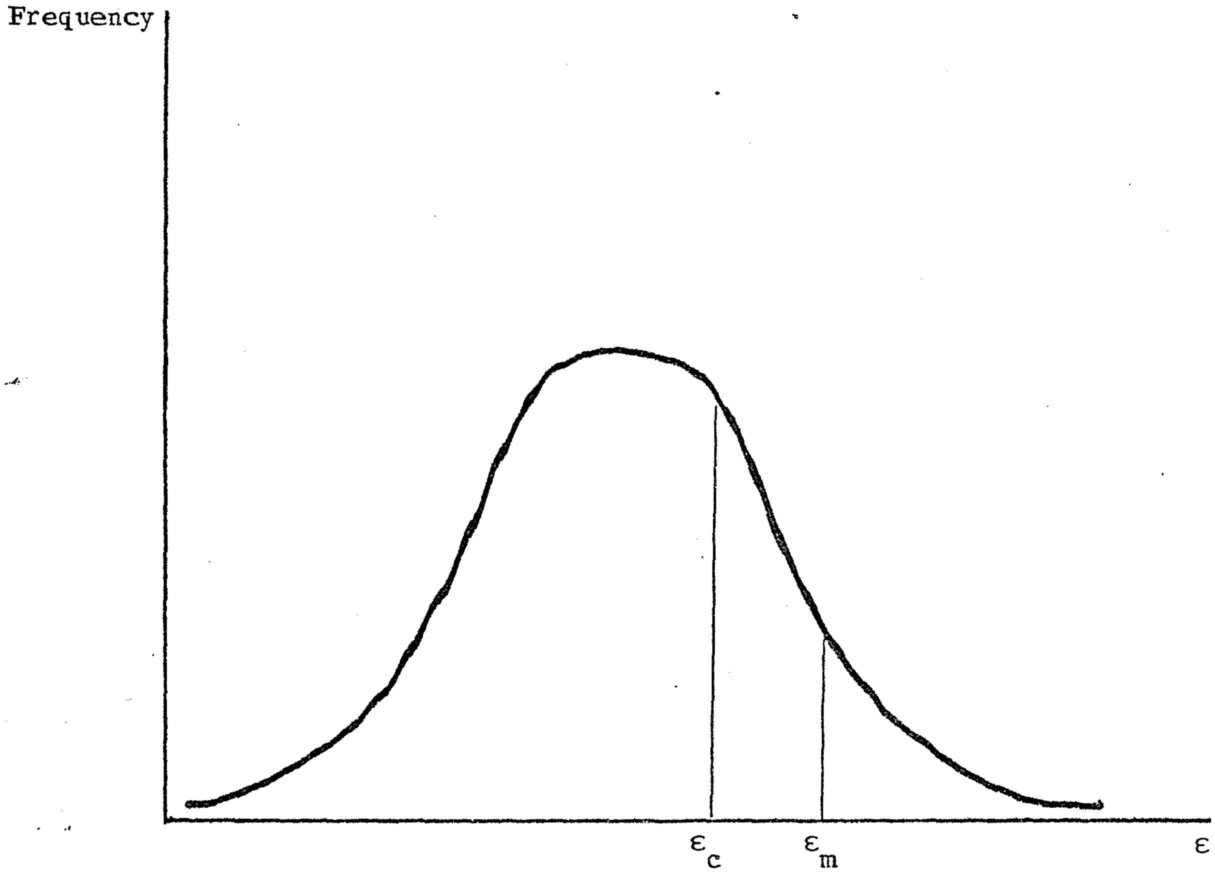
Reder's (1969) analysis highlighted the importance of the non-pecuniary aspects of jobs in determining the outcome of the search process. He argues that the greater the degree of "fussiness" of workers the longer will be the period of job search. In practice, one is likely to find a high degree of fussiness where the costs of movement from one location to another and the geographical dispersion of job offers are both very high. Where the total costs are high, it will require an unusually attractive job opportunity to induce a worker to move. This may be interpreted to mean that the percentage of job offers, in an economy, that the worker would accept varies inversely with his cost of moving.

In the terminology of other search theorists locational preference may cause a worker to set a high reservation wage - one which is sufficient to compensate for both the monetary and psychic costs of moving.

4.3 The Occupational and Industrial Dimensions of Unemployment

Although the main focus of this chapter is on the concept of search by unemployed workers we have seen that the search model can easily be adapted to describe employers' behaviour in trying to fill vacancies.[13] As of any given moment there is a loss from leaving a job unfilled. This will be reflected in the value of foregone output and/or the higher cost of producing a given output with the job unfilled. This loss increases with the premium attached to promptness of delivery of the output associated with the jobs and/or the extra costs of producing the output with alternative arrangements. If the cost of an unfilled vacancy is high the employer will want to reduce his search time. This will be the case for occupations that are highly skilled and industries that are characterized by high and advanced technology and rigid technological requirements. For such employers search time is costly and they therefore adopt policies to avoid prolonged periods of search.

FIGURE G. The Reduction of Acceptable Job Offers Resulting from Minimum Wages



In other industries and occupations the costs are not nearly as high and employers would prefer to search for workers rather than initiate costly recruitment procedures such as pre-hiring which would involve the payment of wages before the labour was actually required.

The outcome of such a search behaviour will be that D_L^S will lie closer to D_L for employers requiring highly skilled labour than for employers requiring less skilled labour. In the absence of supply constraints this will mean that unemployment of a non-demand-deficient type will be greater in the latter set of industries

4.4 A Search Theoretic Explanation of Age, Sex and Ethnic Differences in Unemployment

Search theory also appears to provide an explanation of the relatively high unemployment rates experienced by the young, women and ethnic minorities. The explanation is couched in terms of the existence of legal and/or customary minimum wage rates that affect hourly earnings at the bottom of the community wage hierarchy, but not those on better paying jobs. The argument is presented most succinctly by McCall (1970). Consider an individual who is unemployed and faces a distribution of job offers as given in Figure G. He is following an optimal policy and waiting until an offer exceeds the critical wage offer ε_c. If the minimum wage, ε_m, is less than ε_c, it will have no influence on his behaviour. If, however, ε_m exceeds ε_c, offers between ε_c and ε_m, which the individual previously would have accepted, are now excluded to him by the minimum wage. Consequently the expected period of unemployment is increased.

In the absence of minimum wage legislation we can still expect unemployment to be concentrated amongst new entrants and persons whose work-force attachment is weak. Such workers will be confronted with a distribution of job offers which has fewer offers in the upper section of the wage distribution than is the case for "permanent" work force members. The nature of this distribution reflects the lower value placed on such workers by prospective employers because of their inexperience and/or their unstable work record. At any given acceptance wage, therefore, the number of jobs offering at least the acceptance wage will be greater for "permanent" work-force members than for the rest and consequently the time spent in unemployed search will be less. It might reasonably be expected that a "permanent" work-force member would set a higher acceptance wage than a new entrant or a "temporary". The greater the difference in the respective acceptance wages the less the difference in unemployment experience. Conversely, the narrower the reservation wage differential the greater the expected difference in unemployment experience. Thus, the narrowing in the youth-adult wage differential and the advent of equal pay legislation may, in a search theoretic context, explain the concentration of unemployment amongst youth, women and, to some extent, ethnic minorities.

In addition to the foregoing, search by younger workers can be expected to be longer than for adult workers because (a) they expect to benefit from their search for a longer period of time, (b) their search costs are generally lower and (c) their search procedure is less efficient.

5. CRITICISMS OF, AND SUPPLEMENTS TO, THE SEARCH THEORETIC EXPLANATION OF UNEMPLOYMENT

5.1 Introduction

Search theory appears to provide an acceptable explanation of some of the activities of the unemployed once they have lost their job. However it is unable to explain why individuals become unemployed in the first place except to argue that all unemployment represents voluntary quits of a utility maximizing nature. A cursory glance at the evidence should be sufficient to establish that it is impossible to squeeze all unemployment into this mould. In particular, search theory provides no explanation for layoffs - either temporary or long-term. It is this fact that has in recent years led to the development of complementary theories to explain the phenomenon of layoffs. These theories include the theory of queues, the theory of temporary layoffs and implicit contract theory. While they arose as a response to observations on unemployment that could not successfully be handled by search theory, the authors of each approach did not see their work as supplanting search as an explanation of voluntary unemployment. In addition, their work continued the development of a micro-economic explanation of unemployment in the neoclassical tradition.

A less orthodox approach to the study of the unemployment problem is that of the dual or, more generally, segmented labour market theorists.[14] Dual labour market theorists object to the dismisal of demand-deficient unemployment as being unimportant and challenge the hypothesis that unemployment and wage determination are inexorably linked.

5.2 Queue Theory and Unemployment

Archibald (1977) argued that search theory fails to explain involuntary unemployment and layoffs because it ignores the step in which workers place applications with prospective employers. The optimal strategy for a firm is for it to hold a store of readily available labour in the form of a queue of applicants. Ignoring the application step precludes analyzing this behaviour. The demand for a queue of applications is derived from its value as a buffer against possible shortages of output. The size of the queue depends upon the relationship between the expected costs of output shortages and the expected costs of maintaining the queue. Applications, to join a firm's queue, will only be made if the acceptance wage of the employee equals the wage offered by an individual firm. The firm will set its wage at a level which equates new applications with offers made to replace quits and retirements - thus maintaining the size of the queue. The pool of unemployed is composed of unemployed searchers who are on firms' queues of applicants. These are not workers who have quit to search for a higher wage, but workers who have, by placing applications, announced their desire to supply more labour at the current wage than is being demanded. Clearly, this type of unemployment is involuntary.

An individual firm could not expect wage cuts which it initiated to be followed by other firms. The firm which cut wages would be faced with an increased quit rate and a decreasing rate of offers accepted. It could not, therefore, maintain a sufficient labour force without increasing its wage. Thus a firm faced with what it feels is a temporary or firm specific decrease in demand would respond with a layoff as opposed to a wage cut. The pool of unemployed would comprise of those who had been laid off and new entrants. Thus the model predicts that young people and other new entrants would make up a large precentage of total unemployment. These groups would tend to suffer longer unemployment than others as people who had been laid off will be recalled by firms before others on the firms queue. Such workers may also have placed themselves in advanced positions on the queues of other firms prior to the time they were laid off.

This theory, unfortunately, appears to misinterpret the concept of vacancies. Vacancies are, in terms of the theory, synonomous with job offers. In reality, however, unfilled vacancies are invitations for applications. Indeed, except for persons who are laid off, it is doubtful that queues will develop in the absence of vacancies within a firm. Search theory suggests that an unemployed searcher much first find a vacancy and then consider whether or not the job will meet his requirements. If a worker can find no vacancies he is likely to become a discouraged worker rather than make futile applications for jobs. Archibald does not allow for this effect. Similarly, it seems unlikely that new entrants will place applications with firms for which they are unable to observe vacancies. The longer-term unemployment that Archibald argues that these groups suffer cannot be explained by the theory he presents. It would seem reasonable to conclude that

Archibald's queue theory, while offering a useful explanation of the behaviour of those laid off temporarily, fails to explain the concept of permanent layoff and the response of workers who enter unemployment as a result.

An alternative theory of job queues and layoffs is offered by Weiss (1980). Weiss argues that the firm is not interested in choosing the minimum wage at which its demand for labour is satisfied but rather, in choosing the wage which minimizes its cost per efficiency-unit of labour. Thus it is not the cost of "workers" which concerns the firm but the cost of labour inputs. Because wages affect the quality of persons applying for jobs, the wage which minimizes each firm's cost per efficiency-unit of labour may result in an excess supply of workers to all firms. In this theory the queue does not result from any firm's attempt to establish a pool of workers as a buffer against demand fluctuations but rather because of vacancies with wages above the acceptance wage of more workers than required being announced. When the firm faces a fall in demand it must decide whether to reduce wages (which will lead to quits) or layoff workers. The theory assumes that there are quality differences among the firm's workers which are unperceived by the firm but which are correlated with the alternative income those workers would receive elsewhere in the economy. If the firm cut its wages, its best workers would quit. To avoid the adverse selection ramifications of a wage cut, firms may instead arbitrarily lay off workers.[15]

The response of firms in recession, indicated by this theory, seems plausible, however, the choice of workers when hiring, is not adequately explained. If quality differences amongst individual workers in a particular group cannot be perceived when it comes to laying-off workers (after they have been employed for some time and management has had the opportunity of observing them at work), an even greater difficulty exists when it comes to hiring initially. If firms cannot be sure that they have chosen the best workers offering themselves at the going wage initially, they will be less inclined to want to retain them when demand falls. In any case, if the differences in quality are not perceived, the workers laid off may include the best workers so that the purpose of layoffs - ensuring the best workers do not quit following wage reductions - will be defeated. If the firm can perceive differences in quality, the neoclassical argument would suggest that such workers are paid according to their ability and value to the firm. The relationship of this theory with search theory must also be questioned. Search theory argues that unfilled vacancies exist because firms take time to "sift through" the workers applying for positions in order to obtain the best. Queue theory, on the other hand is based on the unrealistic premise that employers are unable to ascertain the quality of workers both before they are taken on and after they have been employed.

5.3 The Theory of Temporary Layoffs

Feldstein (1975a), despite the lack of published data on temporary layoffs, presents data showing the lack of job search among laid-off workers and their high probability of recall and concludes that temporary layoffs are very important in the unemployment count, particularly during recessions, and argues that search theory may have gone astray in failing to account for temporary layoffs. Bradshaw and Scholl (1976) dispute Feldstein's interpretation of the data. They note that Feldstein's primary data source, the Current Population Survey, is not designed to obtain job-search information from persons on layoff. Moreover, evidence from other sources [16] indicate that a greater proportion of those on layoff than suggested by Feldstein search for work.

Feldstein (1976) and Baily (1977a), each established a theory of temporary layoffs. Both see layoffs as the outcome of arrangements between employers and employees which have been mutally agreed to. In effect each paper is attempting to show the importance of unemployment insurance in raising unemployment as both suggest that layoffs are higher the higher the income available to workers when they are out of work. Although the analysis is quite rigorous it is dependent on institutional arrangements that are peculiar to the USA hence, they will not be persued here.

Later papers by Hall (1979) and Clark and Summers (1979) concurred with the findings of Bradshaw and Scholl that temporary layoffs were unimportant and that the pressing problem was to explain why it is that relatively few people are out of work part of the time. None of the adjuncts to search theory, including the theory of implicit contracts, to which we now turn, are able to do this well. Indeed, the overiding impression that one gets on reading the search and related literature is that unemployment spells are expected to be of short duration.

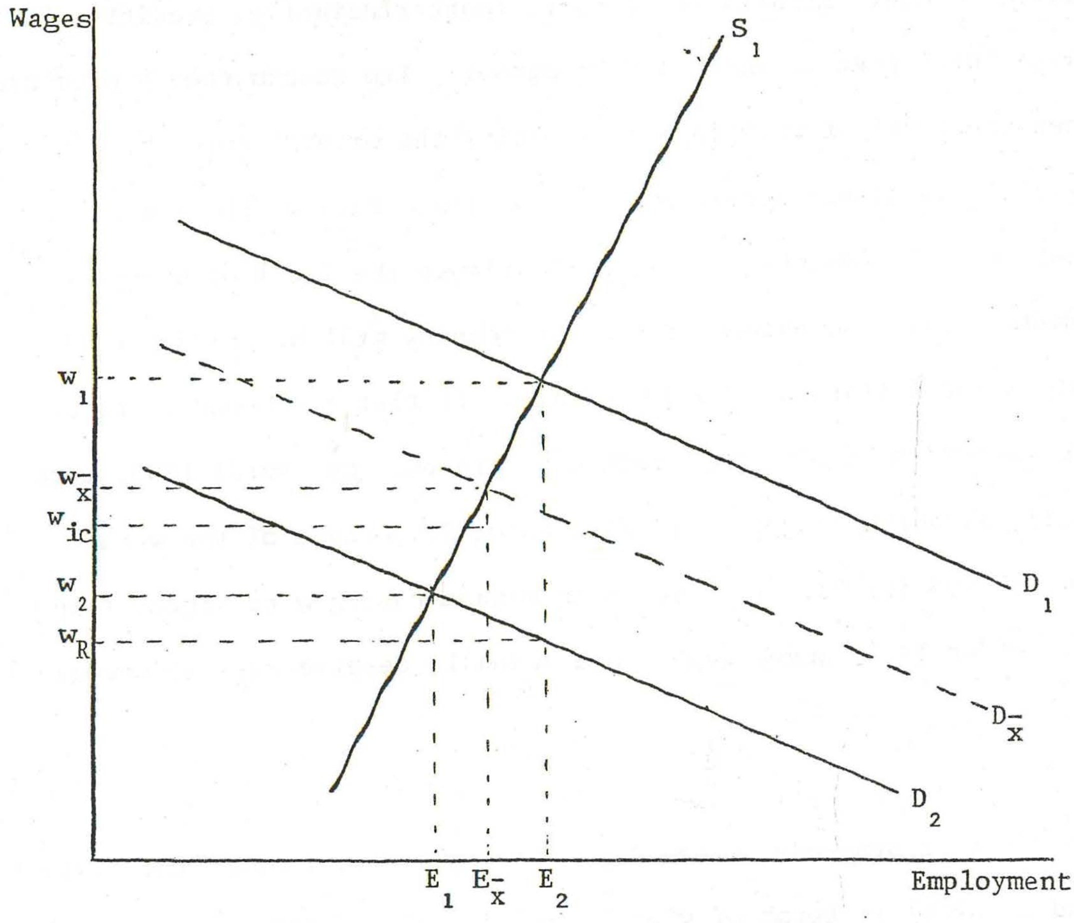
5.4 Quasi-Contract Theory

One of the first to object to search theory was Donald Gordon (1974). He noted a number of difficulties associated with the search model. The first concerned a logical difficulty with respect to the incompatibility between the decisions of prospective employees and the decisions of employers. An employee can make an intelligent decision to accept or reject a job only if he has some idea, not only of the current wage, but of the future wage and of the likelihood of continued employment at that wage. Most search models assume a constant wage for an indefinite period of employment. Such stability is contradictory because it is inconsistent with the presumed behaviour of the employer. This latter is assumed to adjust more or less continually along the dynamic supply function which itself will be continually reformulated as he receives new data.

The remaining objections were based on empirical difficulties and were considered by Gordon to be more important. First, as others have noted, the theory does not provide for layoffs. Second, the theory predicts an increase in quits during recessions which is the opposite of what happens in reality. Third, the theory implies that all employers are always willing to hire in any job classification at any stage of the business cycle. Finally the theory, counterfactually, predicts a Phillips Curve that is vertical throughout. The search theory predicts that when the level of unemployment is below the natural rate the economy will experience accelerating inflation. Because the theory is symmetrical it predicts that in periods when the level of unemployment remains above the natural rate, the economy will be characterized by accelerating deflation. Gordon pointed out that the broad facts of economic history make this implausible. In the US until 1933, money wages fell, although sluggishly. With about 24 percent of the work force unemployed in 1933, real wages in manufacturing were higher than in 1929. After 1933, money wages rose annually despite massive unemployment.

Gordon then proceeds to develop a theory of involuntary unemployment (and layoffs) in terms of what he calls a quasi-contract model. This model is based on two postulates. First, both the owners of human capital and non-human capital are subject to risk. The owners of non-human capital can reduce the amount of risk by the use of long-term contracts and diversifications. Neither of these options are open to

FIGURE H. A Theory of Implicit Contracts



the owners of human capital. Second, there exists quasi-contracts. Quasi-contracts are defined as existing when an individual or firm can induce another individual or firm to act to a large degree as if the former were legally constrained to act in that manner.

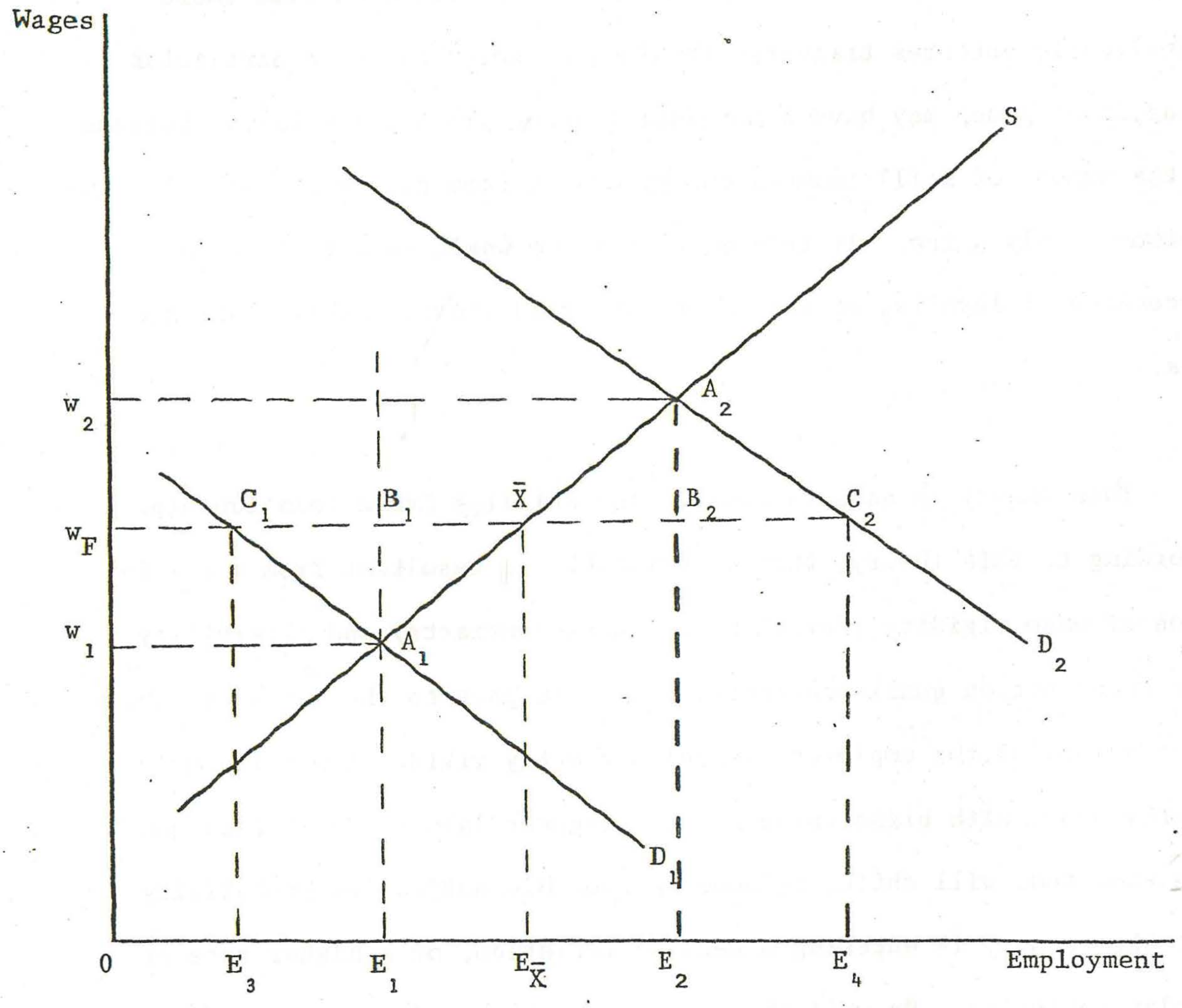
Given these two postulates, mutual gain is available to employer and employee from exchange. Employees, who can reduce their risk in no other way, will, to some extent, prefer a lower expected wage with a smaller variance to a more uncertain income. In the interest of getting cheaper labour, employers can enter into implicit long-term quasi-contracts with their employees by guaranteeing them some reasonable security.

In Figure H demand for labour fluctuates between D_1 and D_2 with an expected value of $D_{\bar{X}}$. Employers are assumed to be indifferent between the fluctuating wage (w_1 to w_2) and employment (E_1 to E_2) and a constant wage ($w_{\bar{X}}$) and employment ($E_{\bar{X}}$). Employees on the other hand, because they are risk averse, will be prepared to accept a lower wage than $w_{\bar{X}}$ (eg. w_{ic}) in return for an employment level of $E_{\bar{X}}$. When demand in the product market is such that the demand for labour is $D_{\bar{X}}$ only those on the implicit contract will be employed. For demand above this level (eg. at D_1) additional, casual labour will be employed at the higher wage necessary to call forth such workers. When demand falls (eg. to D_2) all casual labourers will be laid off. This is because the reduction in wage necessary to maintain them in employment is from w_1 to w_R.

To increase the realism of this model Gordon argues that there will be, within the firm, different risk-sharing quasi-contracts with different employees. Thus groups of employees will have different degrees of security. If the firm were to experience a continuing decline in demand, or a given decline in demand were to continue for a long enough period, the continuing misfortunes would cause each class of employees to lose their security successively. Yet each time these undesireable outcomes triggered the loss of security for a particular group, that group may have a marginal revenue product far below (because of the number of still tenured employees) its contract wage and below its minimum supply price. If this were true, we would expect to see a succession of layoffs, of the nature analysed above, rather than wage cuts.

This theory is able to explain the Phillips Curve relationship. According to this theory, that relationship is resultant from a combination of wage rigidity (for those on quasi-contracts) and flexibility (for those not on quasi-contracts). With respect to the long-run, the expectations of the employer are not perfectly rigid. A particularly lengthy boom, with higher prices and a tighter labour market than had been expected, will shift, to some degree, his subjective probability that the economy is entering a secular inflation, or a higher rate of secular inflation. He will then change the terms of his quasi-contract by an appropriate amount, i.e., what may be called his personal Phillips Curve will have shifted upward (for wealth maximizing reasons).

FIGURE I. An Alternative Theory of Implicit Contracts



The shift of the Phillips Curve predicted by this model is much slower than that predicted by search theory in which the employer adapts to the current market situation to optimize his welfare. In the contract model, the employer adapts to the current market situation only to the extent that this conclusion affects his long-term prediction of future wages and prices. He does not adjust optimally to meet the current situation.

The implicit (or quasi) contract approach has been advocated by other authors, in particular Baily (1974) and Azariadis (1975) and (1976). However it has not been without its critics. R.J. Gordon (1976) argues that the basic assumption that employees are more risk averse than employers, which underlies the analysis of Donald Gordon, Azariadis and Baily, is neither necessary nor sufficient to explain why firms react to a decline in product demand by laying off workers rather than by reducing their wages. It is not sufficient because it fails to explain wage rigidity and layoffs when the fall in demand for labour is less than the size of the unsecured (or least secured) group. It is unnecessary because it can be shown that employers will prefer contracts offering fixed wages even in the absence of risk averse employees. In Figure I demand for labour fluctuates between D_1 and D_2. Given that both employers and employees are risk neutral, employers will be indifferent between contract $\bar{X}$, with fixed wage (w_F) and fixed employment ($E_{\bar{X}}$), contract B, with fixed wage (w_F) and variable employment ($E_1 - E_2$) and contract A, with a variable wage ($w_1 - w_2$) and variable employment ($E_1 - E_2$). This is because expected profits will be the same in all three situations. However under contract B (and $\bar{X}$) the firm will not be operating on the demand curve for labour. In periods of low demand the firm is forced to employ workers on which a loss is made. During periods of high demand the firm is unable to employ workers on which profits can be made. Thus it can be shown that the firm would prefer a contract such as C (a fixed wage, w_F, and employment that varies between E_3 and E_4) to contract B (and $\bar{X}$) and, by implication to A.

Further criticisms of contract theory come from Polemarchakis (1979) and Akerlof and Miyazaki (1980). Polemarchakis claims that the implicit contract model offers no new theory of unemployment because it predicts unemployment only when the value of the marginal product of labour falls below the value of leisure. The standard neoclassical model of spot auctions also predicts unemployment in such circumstances. Akerlof and Miyazaki argue in their paper that if workers can implicitly make contracts with the firm, they can also readily insure against employment variations (ie. layoffs) and, as a result, implicit contracts even with sticky wages will lead to full employment, in most instances rather than to unemployment.

5.5 The Dualist Critique of Search Theory

Piore (1979b) argues that search theory starts from two observations: first at any given time there is a relatively wide dispersion of wage rates paid for essentially the same type of work, and second, workers possess relatively little information about the alternatives available.

While it is true that there exists a rather wide and persistent disparity among wages offered for essentially the same work, Dunlop (1957) has shown that many of the higher wage jobs are not available to unemployed workers. In addition while many workers do have poor job information, most of these workers are in what the dual labour market theorists term the primary sector of the labour market. Workers in this sector, professionals, highly skilled craftsmen etc., do not need to be unemployed to search for work. Indeed Mattila (1974) has shown that 50 to 60 percent of all workers line up their new jobs before quitting and leaving their old jobs. Piore (1979b) reports that workers would prefer to search while employed. Search while unemployed incurs costs in the form of foregone income, reduced bargaining power, premature acceptance of jobs and suspicion from employers who doubt the quality of unemployed job candidates. Piore also notes that primary workers describe the experience of unemployment as psychologically debilitating in ways that impinge upon search activity.[17] Finally, from the dualist point of view, unemployment is associated primarily with work in the secondary sector, where there is much less wage dispersion, where there is so much mobility among jobs that workers can obtain information about relative wages either from their own experience or by asking fellow employees and thus do not need to search, and where jobs are of such short duration that it generally would not pay to 'invest' in a search for information.

In presenting their explanation of unemployment Doeringer and Piore (1971) argue that the labour market is divided into a primary and a secondary market. Jobs in the primary market possess several of the following characteristics: high wages, good working conditions, employment stability, chances of advancement, equity and due process in the administration of work rules. Jobs in the secondary market in contrast tend to have low wages and fringe benefits, poor working conditions, high labour turnover, little chance of advancement, and often arbitrary and capricious supervision. Central to the dualist thesis is the notion that entry into and confinement of disadvantaged workers within the secondary sector is not attributable to differences in skills, motivation, or demand for labour but to the power of institutional forces such as discrimination by employers and unions. The primary sector consists of a series of internal markets, ie. a set of structured employment relationships within a firm, embodying a set of rules, formal (as in unionized firms) or informal, that govern each job and their interrelationships. The process of entry into these "primary" internal markets appears to operate like an employment queue. Acceptable workers are ranked in relation to their potential productivity and advanced along the queue until employer needs are met. In the secondary labour market the forces promoting internal labour markets appear to be weaker than is the case for primary employment.

Given such a scenerio the causes of unemployment differ quite markedly from the explanation provided by search theorists. During boom periods the dualists argue that there are more than enough jobs in the secondary market to provide employment for those who are unemployed. However, these are "bad" jobs characterized by the low wages and a lack of career structure. The inferior nature of secondary market management prevents them from taking advantage of boom conditions to upgrade their capital equipment, increasing productivity and placing their firm on a more secure footing. In addition the relatively poorer access of secondary market employers to sources of capital and technical assistance reinforces their inability to acquire the scale and power that would enable them to pay higher wages. Hence economic growth results in an expansion of the number of secondary jobs but not an improvement in their quality. Thus the dualists argue that frictional unemployment is a result of high turnover in the secondary sector resulting from a lack of incentive for workers or employers to maintain stable employment relationships. This explanation is quite different to that provided by search theorists. The search model argues that periods of unemployment are spent searching for a better job. Instead, individuals in the secondary market seem to move from one bad job to another. Harrison and Sum (1979) indicate that this problem cannot be overcome by the movement of secondary sector workers into the primary sector. While economic growth may result in shortages in the primary labour market, mobility of secondary workers is restricted because of technical, "paper", or ascriptive requirements for admission to the primary labour market - for example, specific skill, educational credential, or race and sex entry screens.

In order to explain demand-deficient unemployment the dualists fall back on the writings of Keynes.

> The level of unemployment is determined by the aggregate demand. Demand, in turn, can be regulated by the government through monetary and fiscal policy. The techniques for doing so have been clear since the publications of Keynes' General Theory in the 1930s. (Piore 1979b p.9)

Piore considers that it is an important requirement for any theory of unemployment to explain why it is that, at any aggregate level, unemployment is concentrated among certain demographic groups. i.e. racial minorities, youths and women. In the light of our examination of the characteristics of the dual labour market an explanation of this phenomenon is not difficult. The groups that are reported as suffering the highest unemployment rates are the same groups as we expect to find in secondary jobs. Secondary jobs tend to be found in marginal firms. Jobs which are especially sensitive to economic flux and uncertainty are going to be a particularly important source of layoffs. Hence, during economic downturns unemployment in specific groups rises because these groups are employed in the most vulnerable industries.

The marked rise in unemployment in recent years has resulted, in dualist terms, from what Cornwall (1981) calls bumping down of workers into secondary jobs. This has followed from what Piore (1979a) sees as a disproportionate "tilt" in economic expansion toward the secondary sector caused by employers in the 1960s and 1970s attempting to meet economic expansions through temporary arrangements which are easily reversed. They responded to an expansion in demand with greater utilization of existing equipment, retaining facilities that in other circumstances would have been scrapped. Consequently labour productivity fell and many workers were pushed down into secondary status. The explanation for this response lies in the uncertainty that existed throughout the period in the minds of businessmen, first because of the Vietnam War and secondly because of the energy crisis triggered by the OPEC oil embargo.

The major policy proposal of the dualists calls on government to create more good jobs, in either the public or the private sphere. They feel that they have shown that whatever the rate of unemployment may be, the burden is not shared equally by all demographic groups and that layoffs and firings are associated primarily with the secondary labour market. As a result, non-whites, women and others who are overrepresented in the secondary labour market experience a disproportionate amount of unemployment as well. Thus public policy to eliminate the poorest jobs and to create enough good jobs to allow for the upward mobility of women and blacks without displacing workers in better jobs is clearly required. Piore (1979b) notes that both equal employment and education and training must be conceived in terms of a broader framework which takes account of available job opportunities. Retraining etc. is not going to be effective unless there are enough "good" jobs to promote the upward mobility of the disadvantaged groups without displacing prime-age working males.

The dualists suggest that the Government impose on the secondary sector the characteristics of the primary sector by such methods as increasing the coverage and extent of minimum wage laws, encouraging unionization, and expanding social leglisation to modify the forces of, for example, racial discrimination.[18] In addition Piore (1979b) argues that should a scarcity of good jobs arise we could delay the entrance of white males into the labour force by expanded education and training or promoting early retirement in certain sectors by adjustments in the social security system.

The writings of the dualists have been criticised as not providing an overall theory of the labour market and as being taxonomic rather than rigorous.[19] With respect to unemployment Wachter (1974) argues that the dualist model is compatible with neoclassical theory and that they merely emphasize different parameters than a more orthodox model of structural unemployment. i.e. the older view emphasizes the excess supply of low-skilled workers, whereas the dual model stresses the adequacy of demand for secondary workers. In attempting to defend orthodoxy, Cain (1976) asks if human capital models are able to provide explanations for the level of wages received, why should these models not apply to fringe benefits and employment stability, which are also components of job renumeration? The stated purpose of the rhetorical question is not to dismiss the attention given to unemployment and job instability among dual labour market economists, but rather to question whether a prima facie case for the failure of neoclassical economic models should rest on the existence of job instability among a significant portion of low-skilled workers and low paying jobs.

6. CONCLUSION

In this chapter the main focus of our attention has been the theory of search which has been developed in recent years as both an explanation of unemployment and an underpinning for the Phillips Curve that allows for a long-run vertical trade-off. In the extreme view, search is proposed as the sole cause of unemployment. Others, while accepting much of the search literature, note that there are some aspects of unemployment that cannot be successfully handled in a search framework. These writers have contributed theories of their own. Such "complements" to search are usually expressed in a neoclassical form and do not, as a rule, wander far from the basic tenet of search theorists that unemployment is a voluntary state. In stark contrast to each of the foregoing approaches is the development of the segmented labour market theory which accepts both the Keynesian analysis of, and prescription for, demand-deficient unemployment.

Although it would be instructive to analyse all of the unemployment theories canvassed in greater detail, considerations of time and space do not permit. Thus, although the other theories are important, we will restrict ourselves, in this thesis, to issues raised by the search literature. In the chapter to follow we will extend our analysis of search by considering its application to certain unemployment related problems. In so doing we will endeavour to develop hypotheses that are testable in the New Zealand context.

NOTES

1. For a seminal treatment of search as investment see Stigler (1962). The original treatment of labour as a quasi-fixed factor is attributed to Oi (1962).

2. Friedman did allow for changes in the natural rate in the long run. These, he argued, would result from changes in the structural characteristics of the market.

3. Note that neither writer considered unemployment due to search the sole determinant of the natural rate of unemployment.

4. We use the terms measured supply curve and measured demand curve because in reality the actual curves are not observable. For various reasons (to be taken up in later chapters) employers may overstate or understate the true level of vacancies. Similarly, employees may overstate or understate their availability for work. For the time being we will take the counter-factual position that such mistatement does not occur and that therefore the measured demand and supply curves are equated with the actual supply and demand curves.

5. Structural unemployment can be considered an extreme form of frictional unemployment. However, as we distinguish between them in a later chapter, it will serve our purpose better if we now refer to structural plus frictional unemployment as non-demand-deficient unemployment.

6. This denial is explicit in the work of Fisher (1976 p.53) who writes: "I would maintain that involuntary unemployment as a phenomenon still lacks confirmation, and the success of implied policy correctives is not clearly shown."

7. This is in sharp contrast with the work of Reder (1969) considered in section 2.2 Reder makes it very clear that what he is providing is a theory of frictional unemployment at full employment.

8. We are continuing to assume that measured demand and measured supply are equal to actual demand and actual supply.

9. In line with the reasoning of the search theorists covered in section 2.5 we continue to assume that if an employee finds it necessary to lower his reservation wage, or an employer to raise his wage offer, they will not withdraw from the market once having been attracted into it by a given mean market wage. If sufficient time was available at the existing mean market wage to allow all the necessary adjustments to be made the market would eventually be cleared.

10. Reder (1969) and Mortensen (1970b) have been particularly important in contributing to this aspect of the theory.

11. Whether or not an absolute reduction in unemployment occurs depends upon how far to the right D_L^s moved. However we can be sure that the unemployment rate will decline as the rise in the labour force generated by the higher wage will have ensured this.

12. At the new equilibrium wage of W_3 the employers will find that the search necessary to obtain an acceptable worker will be as long as the period of search at the original wage of w_1. Thus $D_L^{s'}$ will move to $D_L^{s''}$.

13. Both Reder (1969) and Gronau (1971) consider this issue in some detail.

14. In this section we will be concerned primarily with the dual labour market theory as developed by Piore (1975), Doeringer and Piore (1971), Harrison (1972) and Bluestone (1970). Alternative approaches do exist, for example Thurow (1972) and (1975) develops what has been termed a "job competition" theory which is closer to the orthodox position than the dual labour market theory. On the other hand a more radical approach has been taken by, amongst others, Wachtel (1972), Edwards _et al_. (1975), Bowles and Gintis (1975) and Franklin and Resnick (1973).

15. In addition to explaining job queues and lay offs, the model presented can account for the different unemployment rates and lay off probabilities of observationally distinct groups in the population.

16. Amongst the evidence cited was Sheppard and Belitsky (1966).

17. "What the workers actually report, however, is that the experience of unemployment is at first so psychologically shattering that they are unable to leave the house, let alone look for work. This suggests that unemployment, at least of the kind experienced in the 1930's, cannot be modeled as the outcome of a rational, deliberative process. Indeed, it is destructive of the capacity to make the very kind of calculations that conventional models assure explains its existence. A truly powerful theory of unemployment would explain why it tends to have this effect". Piore (1979b)

18. Doeringer and Piore (1971) and Watcher (1974) outline some of these proposals.

19. See for example Wachter (1974) and Cain (1976).

CHAPTER 4

APPLICATIONS AND POSSIBLE TESTS OF THE SEARCH THEORETIC APPROACH

1. INTRODUCTION

The purpose of this chapter is to present some of the important empirical implications of the job search theory outlined in Chapter 3 and to assess the extent to which these implications can be used as a test of the relevance of the theory itself. At the outset, a clear distinction should be made between, on the one hand, tests of search as a viable behavioural characteristic of labour market participants and, on the other, tests of search as an explanation of the level, or changes in levels, of unemployment experienced in an economy. In the first instance, individuals may react to certain labour market conditions in a manner similar to that proffered by search theory. However this, in turn, does not necessarily mean that their actions will result in unemployment or a rise in the level of unemployment. Although both types of tests are important we will primarily be concerned with the latter.

Based on the analysis of search theory presented in the previous chapter, three tests can be immediately proposed. First, we may test the prediction of search theory that the asking wage will decline with the increasing duration of unemployment. Second, we may estimate the contribution made to total unemployment by various unemployment types in order to test the search theoretic contention that unemployment is primarily voluntary. Finally, an examination of the data on the duration of unemployment will enable us to test the implication of search theorists that the majority of the unemployed experience isolated spells of short duration.

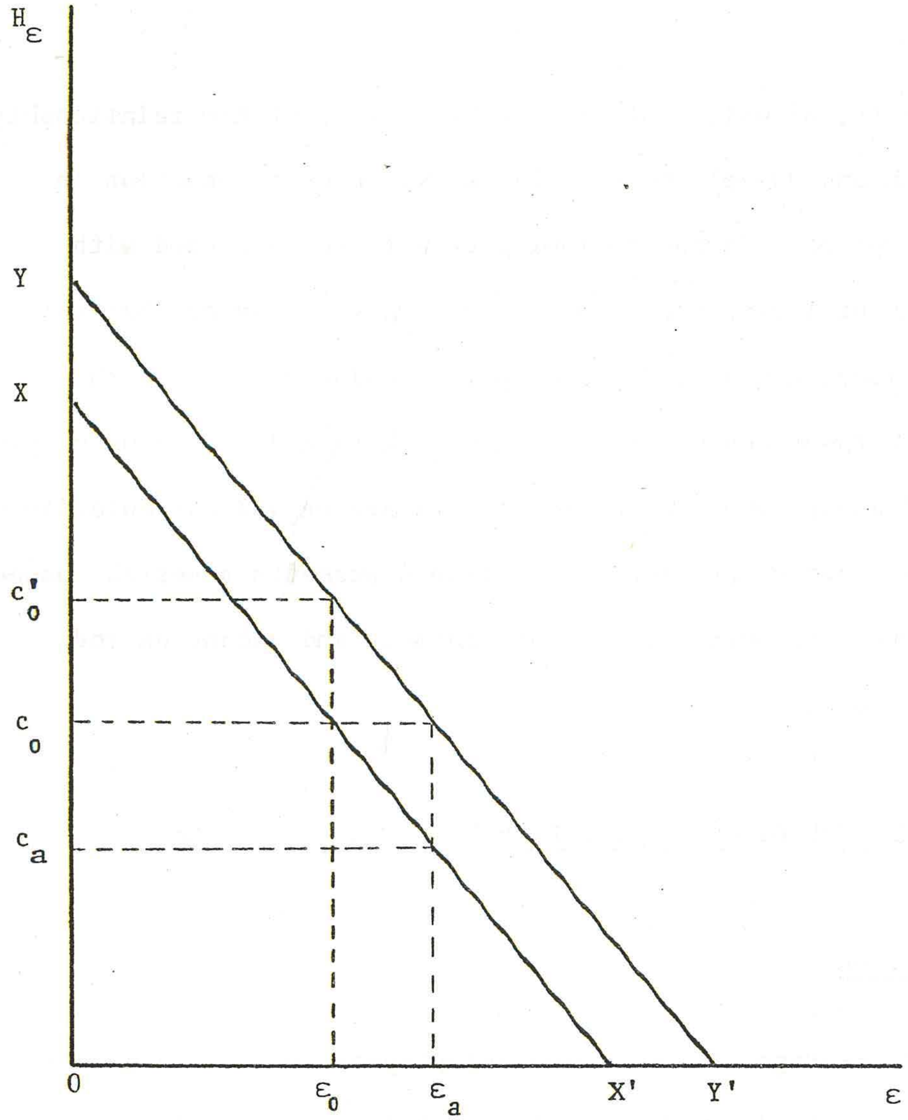
These tests, of which the last two are tests of the relationship between search and unemployment, will receive closer attention in subsequent chapters. In the following we will be concerned with developing and utilizing the theory of search in a manner that will produce additional tests of the concept. Section 2 analyzes the relationship between search, discouraged workers and hidden unemployment. The effect of unemployment benefits on both search and the duration of search is the topic of Section 3. Section 4 presents a search based model of the relationship between unemployment and vacancies and Section 5 concludes.

2. SEARCH AND THE DISCOURAGED WORKER

2.1 Introduction

The poor coverage of registered unemployment statistics, when compared with census data, is notorious. This is especially true for women - a fact commented on in Chapter 2. It is argued that, because married women will generally not qualify for unemployment benefit, they lack the incentive to register and their unemployed state will thus be "hidden". This will also be true of other groups who do not qualify

FIGURE A. McCall's Analysis of the Discouraged Worker Problem



for the benefit - married men whose wives are currently working for example. Some of those who fail to register will not undertake alternative search for work because they feel that it is futile and thus leave the workforce as "discouraged" workers. Search models are able to account for this activity.

2.2 Frictional Unemployment and the Discouraged Worker Phenomenon

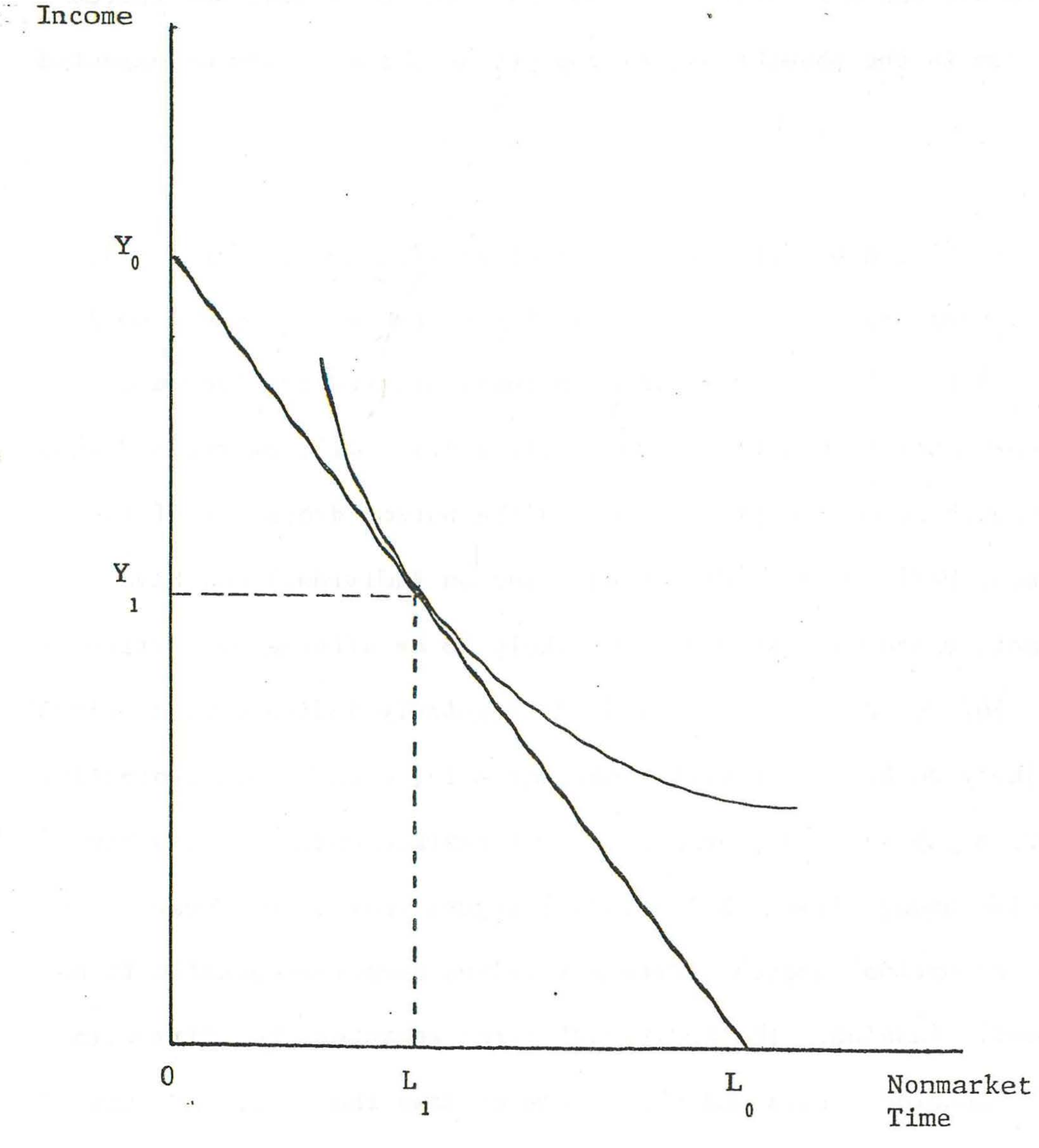
As Lippman and McCall (1976b) point out, the elementary search model is a convenient device for distinguishing the discouraged workers from the frictionally unemployed. The optimal search policy when people with unattractive employment opportunities are confronted with relatively high information costs may be to choose not to search, these are called discouraged workers. The frictionally unemployed are those who are looking for jobs, but have not yet obtained a satisfactory job offer.

The decision, by workers, to drop out is based on the relation between the cost of search and the wage distribution appropriate to their skill level. In terms of McCall's (1970) analysis an individual whose expected returns from remaining unemployed are ε_0 in Figure A and who is confronted with search costs in excess of c_0 will decide that not searching at all is his best strategy.

Previously we assumed that an individual would have no motivation to drop out of the labour force once they had made the initial decision to look for work. For such an assumption to be maintained two conditions must hold. First, there is no limit on the amount of time the individual would search for employment and, secondly, the individual has no prior information to differentiate among prospective employers. If either of these assumptions is relaxed, we find that the individual may indeed drop out, even in the absence of any changes in search costs or expected wages.

If a person sets a limit on the amount of time search for a job, then as time goes on, the chances of finding suitable employment decline. As a result, the individual will tend to lower his reservation wage. As search costs remain positive, eventually a point will be reached when continued search becomes unprofitable and the person drops out of the market. (see McElhattan 1980) In addition an individual may have some information about wages that are likely to be offered by particular employers. For instance, help-wanted ads regularly indicate which firms are most likely to have vacancies. Consequently, even before contacting an employer, a job searcher may possess information which permits him to distinguish among firms. Salap (1973) argues that under these conditions, an optimal search strategy involves sampling specific firms in a systematic fashion. The individual first searches the firm with the highest expected return and then moves on down the list. As this process continues the reservation wage will drop and when search costs exceed expected gains from additional search the person will drop out of the market as a discouraged worker.

FIGURE B. A Simple Model of Utility Maximization



A more detailed analysis of the theory explaining both the discouraged worker and the added worker effects, is possible from the extension of the conventional neoclassical model. Such an extension, focusing on the utility maximizing behaviour of the individual and drawing a clear distinction between discouraged workers and the hidden unemployed, has the advantage of being applicable to forms of unemployment other than frictional and enables us to consider the impact of policies designed to keep workers in the work force by reducing the cost of search to the individual.

2.3 The Neoclassical Extension

The foundation of the neoclassical theory of the discouraged worker is a simple extension of the formal theory of individual behaviour in the labour market. Workers are assumed to attempt to maximize their utility subject to the constraints imposed by the maximum amount of nonmarket time available and the market wage. Such a utility function is depicted by the indifference map of Figure B in which L_0 represents the maximum amount of nomarket time available to an individual in the time period and Y_0 the maximum income that could be attained at the existing wage rate. An individual who is able to obtain $L_0 - L_1$ hours of employment would be maximizing his utility subject to the constraints imposed on him.

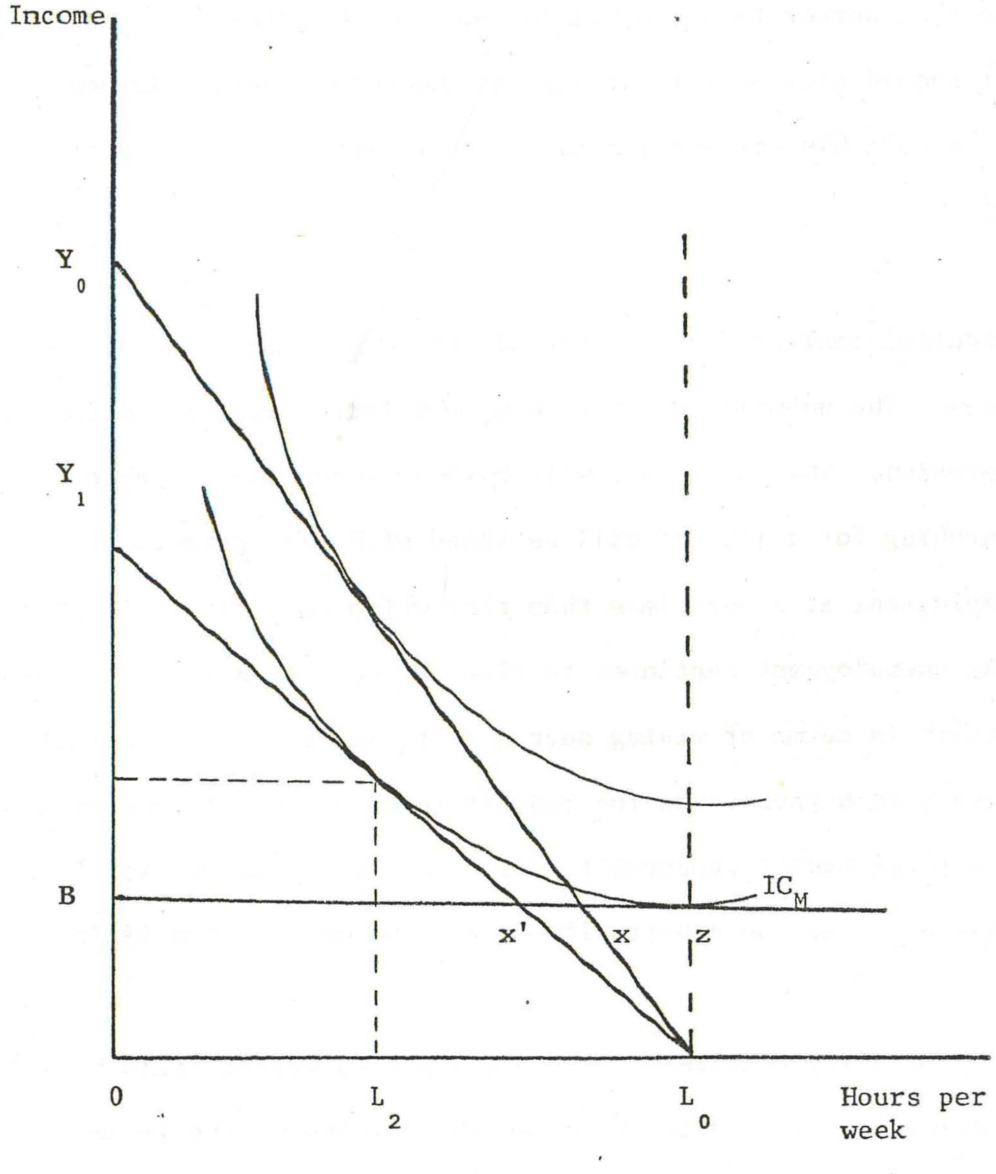
It has been argued[1] that an increase in the level of general unemployment would result in the opportunity constraint $L_0 Y_0$ rotating downward for the employed workers. This argument is based on the assumption that, as a first approximation, the rise in unemployment is equivalent to a fall in real wages, (i.e. to a fall in the opportunity cost of nonmarket time). Given that the substitution effect outweighs any negative income effect the individual will offer less labour and hence is regarded as a discouraged worker. This analysis is misleading in two respects. First, for an employed worker the movement in the real wage will be in the opposite direction to that stated. Second, reduction in hours worked does not provide an explanation of the discouraged worker effect which causes the worker to leave the workforce completely.

An employed worker will be aware that during a period of rising unemployment the difficulty of changing jobs will be increased. If he is contemplating a change in employment he must consider two factors: the costs to be incurred when job search is undertaken and the likliehood of obtaining a new job offering at least the acceptance wage that he has set. As employment opportunities decline, the cost of job search will rise and the potential wage fall.[2] Consequently, the real value of the existing wage will be greater than its monetary value. How much greater is determined by the costs (in terms of search costs and reduction in potential wages) with which the worker would be faced if he were to try and change jobs or if he lost his present employment. The opportunity constraint of the employed individual will therefore rotate upward as unemployment increases (i.e. the opportunity cost of nonmarket time rises rather than falls). While it is possible that the employed worker may now wish to offer less hours of labour in order to maximize his utility it is certain that he will not join the ranks of the discouraged unemployed so long as he retains his job. The explanation for this will become obvious as we consider the response of the unemployed worker to a general increase in unemployment. In addition, it should also be evident that an unemployed worker is now less likely to quit his current job to go in search of a job offering higher wages.

The potential real wage of the unemployed worker falls as unemployment increases. The unemployed worker has no existing wage producing a built-in premium. The unemployed will have to incur considerable costs in searching for a job and will be faced with the prospect of accepting employment at a wage less than that which normally could be acquired. As unemployment continues to rise the cost of being unemployed also rises (both in terms of rising search costs and falling potential wages). Faced with higher costs the benefit to be derived from finding a job falls and the budget constraint facing the unemployed worker rotates downward, (i.e. the opportunity cost of nonmarket time falls).

As the opportunity constraint of the unemployed worker falls he may offer more or less labour depending on the outcome of the income and substitution effects. He is, however, unlikely to reduce his labour supply to zero and thus any fall in the labour supply that does occur

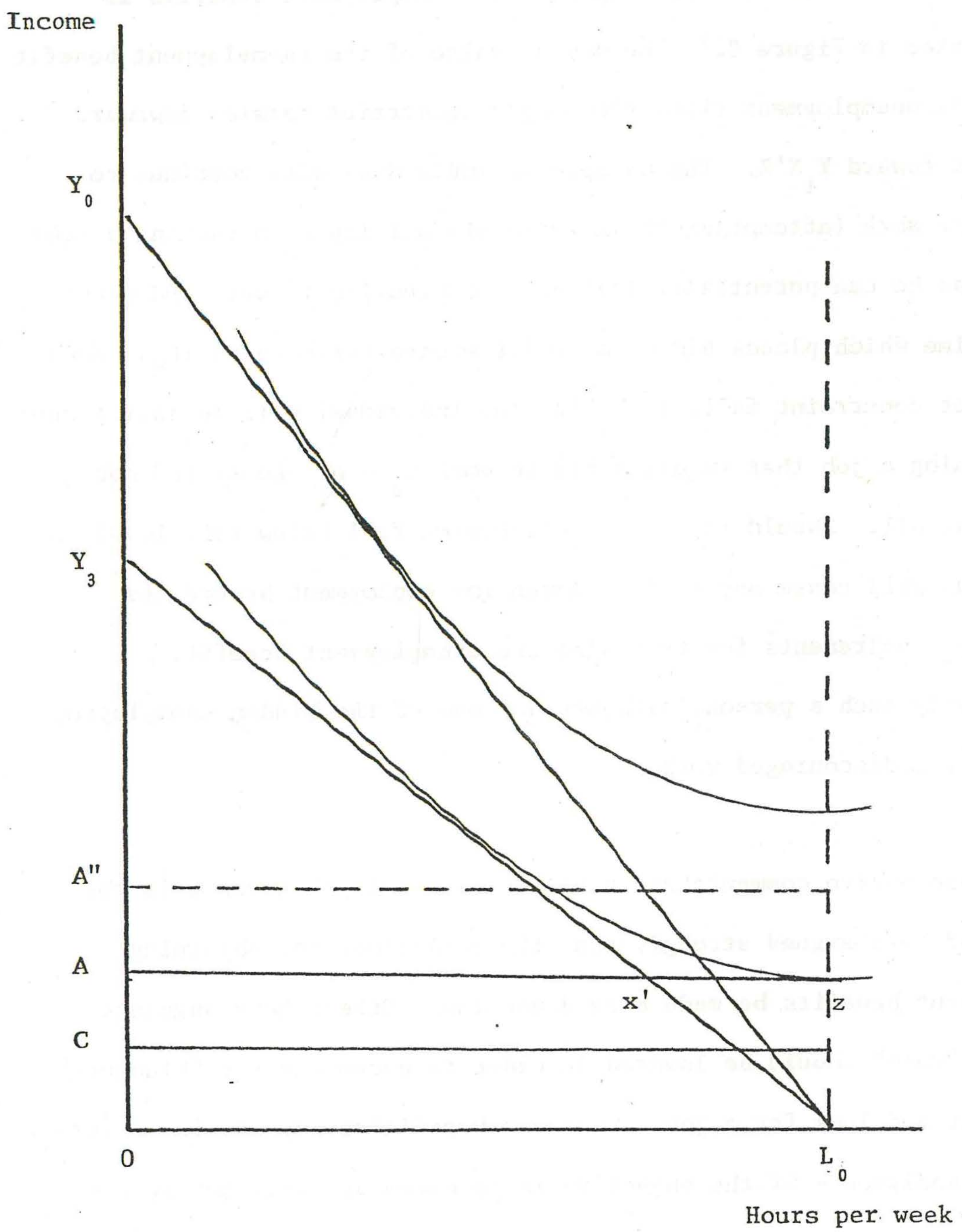
FIGURE C. Discouraged Worker Effect When Unemployment Benefit is Available.



is not likely to explain the discouraged worker effect. The discouraged worker effect can best be analysed if consideration is given to non-market income. Two forms of nonmarket income may be distinguished; unemployment benefits and private nonmarket transfer income.[3] The case of an individual who is eligible for unemployment benefits is demonstrated in Figure C.[4] The weekly value of the unemployment benefit is OB. As unemployment rises the budget constraint rotates downward from Y_0XZ toward $Y_1X'Z$. The unemployed individual will continue to search for work (attempting to maximize his utility by obtaining a job) so long as he can potentially achieve a combination of work and non-market time which places him on an indifference curve above IC_M. When the budget constraint falls to $Y_1X'Z$ the individual will be indifferent to obtaining a job that requires him to work $L_0 - L_2$ hours and not working at all. Should the budget constraint fall below this level the individual will cease any active search for employment beyond the statutory requirements for retaining the unemployment benefit. Consequently such a person, although not one of the hidden unemployed, has become a discouraged worker.

(Conservative commentators have observed this phenomenon in the market and have argued strongly that the conditions for obtaining unemployment benefits be made more demanding. Others have suggested that the "dole" should be lowered in order to encourage the "bludgers" to get out and look for a job. While such policies are not inconsistent with the analyses - if the objective is to encourage real job search - they do seem to be rather short-sighted. An alternative would be

FIGURE D. Discouraged Worker Effect When Nonmarket Income is Available



the introduction of cost effective measures designed to create employment. Such policies would reverse the movement in the budget constraint and have the dual effect of increasing both search effort and the likelihood of search being successful.)

With regard to hidden unemployment, the individual in receipt of unemployment benefits is not a problem as he must be registered as unemployed. However, this is not so with respect to the unemployed worker who is not eligible for unemployment benefit. Figure D depicts the situation of the unemployed worker who is eligible for unemployment benefits as unemployment rises. OA represents the amount of private nonmarket transfer income. When the budget constraint falls below $Y_3X'Z$, by analogy with the foregoing analysis, the worker will cease job search and leave the workforce. Prior to his departure from the work-force the unemployed worker would have been actively engaged in job search in an attempt to maximize his utility. If part of the search strategy had included registration at an unemployment office (despite the worker being ineligible for unemployment benefit) the worker will be recorded as unemployed. If the job search did not include registration, no record of the individual's unemployment will be available. Under these circumstances the worker is part of the hidden unemployed despite the fact that he is not yet discouraged. This finding, and the analogous point made in the previous paragraph, warns us that the terms hidden unemployed and discouraged workers are not synonomous and care should be taken that they are not interchanged haphazardly. The non-registered but non-discouraged unemployed worker will usually be recorded in census data or estimated by survey data as key questions are included in these exercises which are designed to distinguish between those who are currently in the work-force and those who are not.

Once the individual's budget constraint has fallen below $Y_3X'Z$ bringing job search activity to an end, no method of data collection commonly employed will record the individual as unemployed. If the worker had previously registered as unemployed his registration will soon lapse and although still unemployed the worker will not be included in the count. Likewise the job search criteria of census and survey enquiries will no longer be met leading to the individual being classified as not in the work-force. Hence, it is this category of worker which represents the discouraged worker and who presumably makes up the bulk of the hidden unemployed. A further factor may be noted at this stage. Under the usual assumption that indifference curves do not intersect an individual will be more easily discouraged from searching for a job if his nonmarket income is higher rather than low. In Figure D an individual would become discouraged by a drop in the budget constraint less than the fall from Y_0L_0 to Y_3L_0 if his nonmarket income were OA" rather than OA.

FIGURE E. Discouraged Worker Effect When the Time - Search Cost is made Explicit

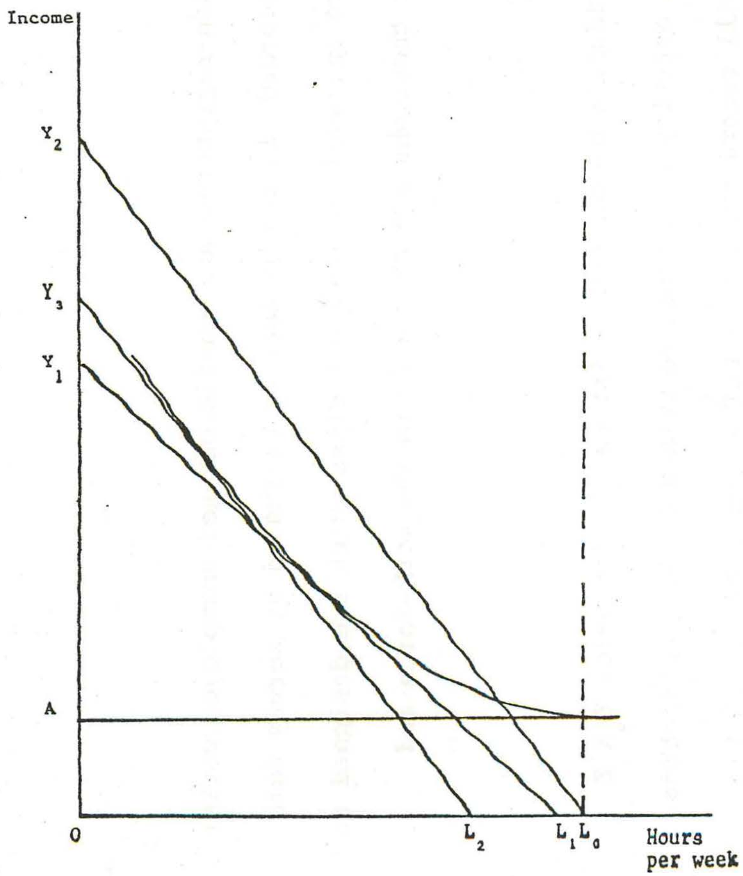
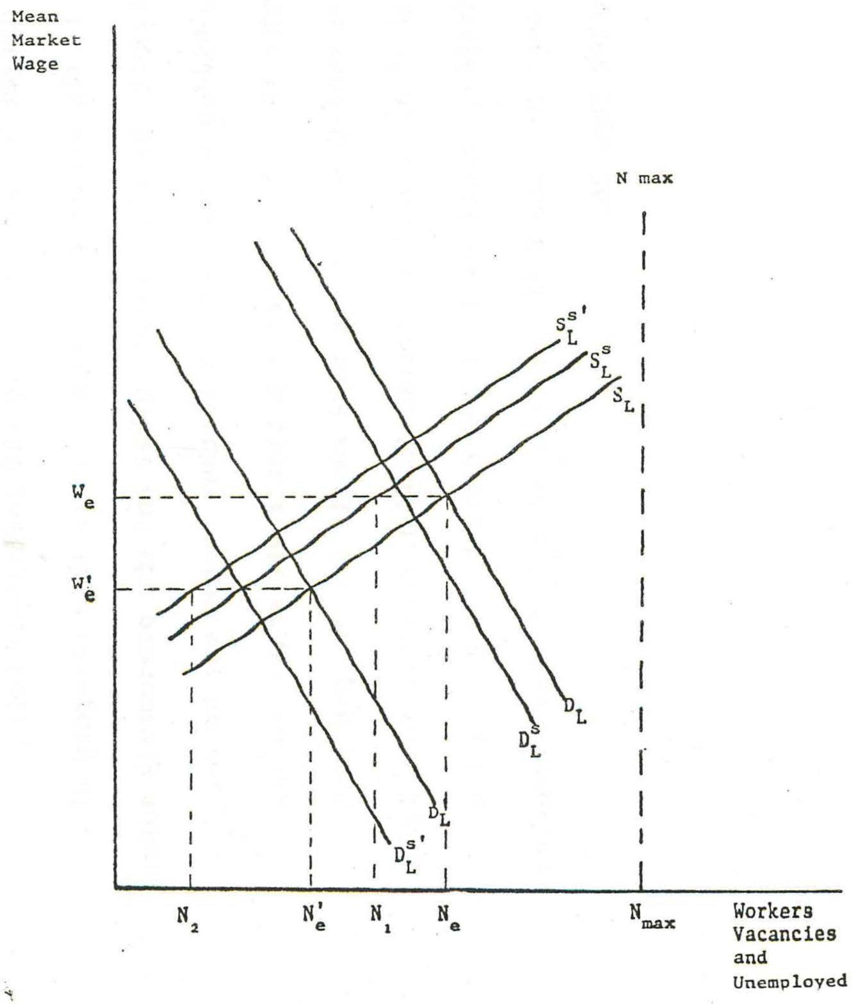


FIGURE F. Discouraged Workers and Unemployment

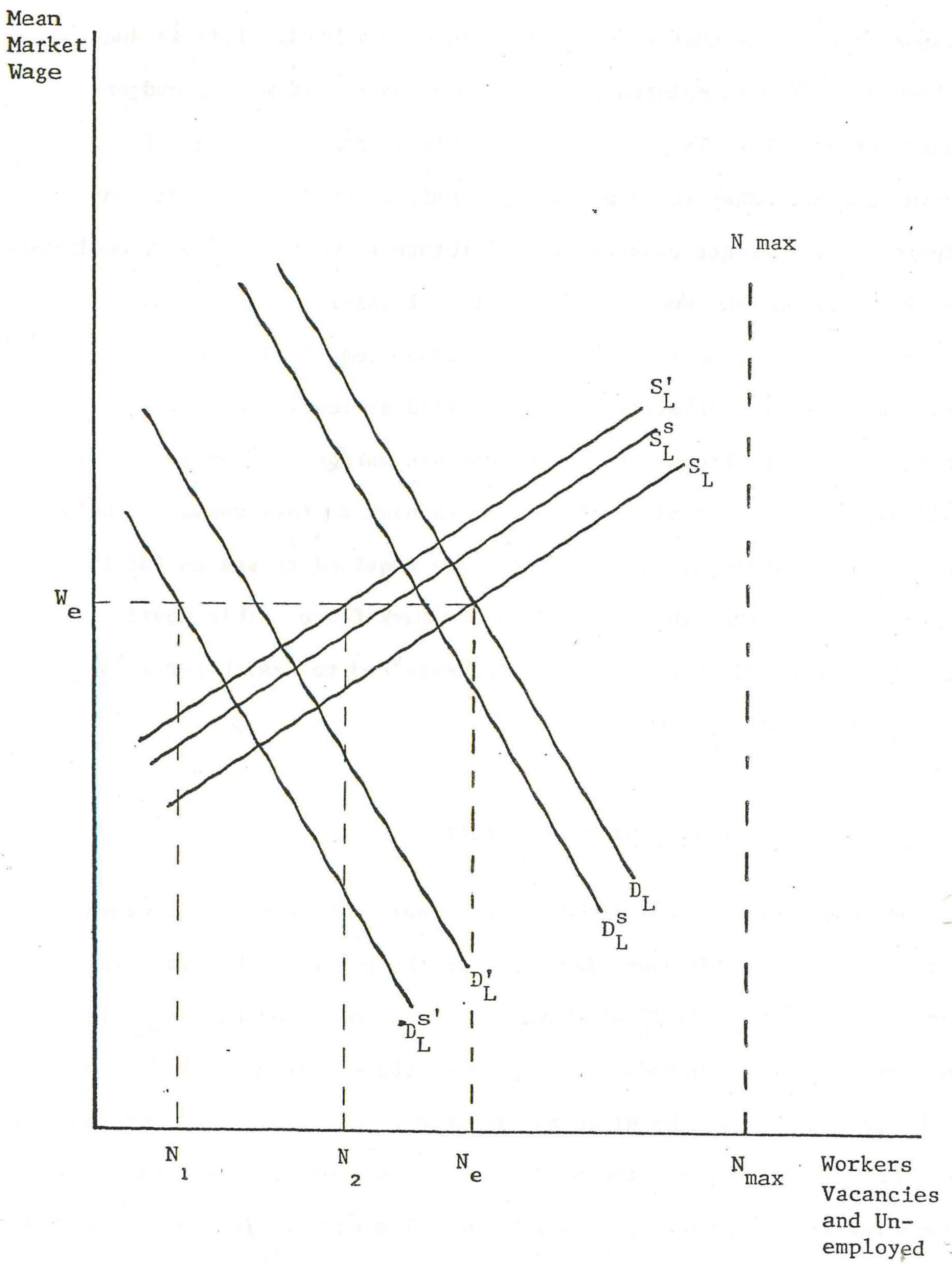


In the foregoing we have assumed that all of the changes in the cost of job search are reflected by the rotation of the budget constraint. However, it is possible to modify the analysis so that changes in the time cost of searching are highlighted. This is done in Figure E. The unemployed worker is now confronted with a budget constraint of Y_1L_1. The distance L_0L_1 represents the amount of search time necessary to obtain the job offer. As labour conditions deteriorate the budget constraint will rotate down as previously analysed. Now, in addition, the budget constraint will shift to the left along the horizontal axis to indicate the increased search time required. This reinforces the likelihood of an individual leaving the work force during a recession because he has become discouraged. Even if workers could obtain a job offering a real wage as high as they commanded before they became unemployed, the length of time required to search for it may be such that they choose to leave the work force. This would occur in Figure E if the length of time required to search for a job offering a wage of L_0Y_2 was L_0L_2.

2.4 Discouraged Workers and Unemployment

Our discussion of the discouraged worker concept can be couched in terms of the search model developed in the previous chapter. In Figure F S_L, S_L^s D_L and D_L^s all have their previous meaning. N_{max} is a new curve we will introduce to represent the potential work force. At the extreme it will be given by all able bodied persons of working age. McCalls' interpretation of discouraged workers can be depicted commencing with the model in equilibrium. The equilibrium wage rate is W_e.

FIGURE G. Discouraged Workers and Demand-Deficient Unemployment



Demand for, and supply of, labour is N_e. As previously explained frictional unemployment is given by $N_1 - N_e$. $N_e - N_{max}$ represents the number of potential workers that are not in the work force because of a dearth of attractive opportunities - they are, therefore, discouraged workers in McCalls' terms.

Worsening economic conditions will shift D_L and D_L^S to the left - to D_L' and $D_L^{S'}$ for example. Poorer job opportunities will mean that search at any given wage will take longer, therefore S_L^S will move to $S_L^{S'}$. The net result will be a lower wage, of W_e', higher frictional unemployment, of $N_2 N_e'$, and a larger number of discouraged workers, $N_e' - N_{max}$.

If the mean market wage is unable to be lowered, demand-deficient unemployment will be generated. This is shown in Figure G. The wage is fixed at W_e. The shift to the left of D_L and D_L^S will create an unemployment level of $N_1 N_e$ initially. If workers now become discouraged about the availability of jobs at existing wages they may well reduce their supply, shifting S_L leftward to S_L'. Two interpretations of discouraged worker are now possible. First, we may argue, as for the flexible wage case, that the distance between S_L' and N_{max} at the existing wage, i.e. $N_2 - N_{max}$ represents discouraged workers. Such a definition is perhaps too broad. More reasonable would be a definition of discouraged worker that related "normal" labour supply to existing labour supply. Thus we may define the number of discouraged workers as given by the distance $N_2 - N_e$.

Our discussion of the discouraged worker concept highlights the distinction we made in Section 1 between search as a labour market reaction in its own right and search as an explanation for unemployment. Above, we considered a situation in which unemployment was generated as a result of insufficient demand. The response to this unemployment was that predicted by the search model, i.e. an increase in the number of discouraged workers. Thus, a test of the concept of search, but not of search's impact on unemployment, involves assessing if in practice the number of discouraged workers rise as employment conditions deteriorate.

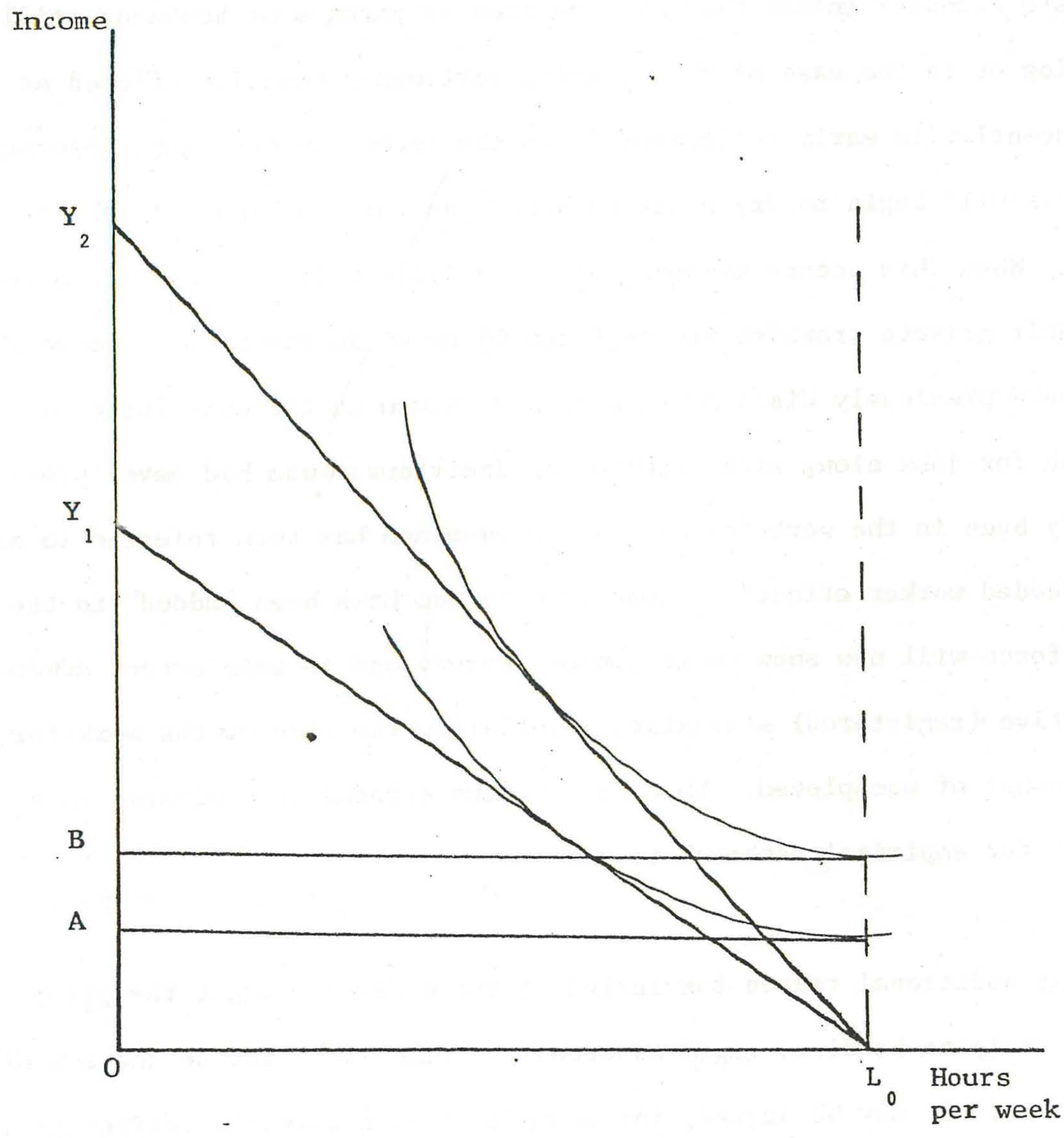
Unfortunately such a test may be difficult to perform. Many of the statistical techniques that have been developed to estimate the amount of hidden unemployment are unable to discern the number of discouraged workers and, as we have already observed, these terms are not synonymous.

2.5 Who Are the Discouraged Workers?

There are a number of things which we may say, a priori, about the characteristics of the group classified as discouraged workers. For example the group is unlikely to be compromised of a high proportion of prime age males who have well developed vocational skills. This type of worker is generally a member of the primary work-force. Because their skill and experience is valued by employers they tend to be the last layed off in an economic downturn. Even when they do find themselves unemployed they will generally be eligible for unemployment benefits and hence register as unemployed with the employment service. It is the members of the "secondary" work-force that are most likely to be discouraged. In the early phases of a recession the young, elderly and unskilled of both sexes and females in general will tend to withdraw from the work-force and make do with their private transfer income. Private transfer income will be generated by parents or husbands still working or in the case of the elderly, retirement benefits offered as an incentive to early retirement.[5] As the recession continues however sources will begin to dry up as husbands and parents also lose their jobs. When this occurs a number of individuals will experience a drop in their private transfer income (from OA to OC in Figure D). Workers who were previously discouraged will now return to the work-force in search for jobs along with a number of individuals who had never previously been in the work-force. This phenomenon has been referred to as the "added worker effect". Those workers who have been "added" to the work-force will now show up in census, survey and to some extent administrative (registered) statistics - inflating the size of the work-force and the number of unemployed. Which of the two effects predominates is a matter for empirical research to resolve.

An additional reason for including the elderly amongst the group most likely to be discouraged concerns the time limit set on the amount of search. It may be argued, for example, that a person's retirement age sets an effective upper limit on the search horizon, so that senior workers are more likely to drop out of the labour market than younger people (see Pissarides 1976).

FIGURE H. Unemployment Benefits as a Solution to the Discouraged Worker Problem



2.6 Reducing the Number of Discouraged Workers

Reducing the number of discouraged workers is a policy to which some search theorists have turned their attention. McCall (1970) argues that there are two effective methods of reducing the number of discouraged workers, reducing the costs of search and upgrading the skills of the individual. In terms of Figure A if the individual, whose return from remaining unemployed is ε_0, has his search costs reduced from an amount larger than c_0 to c_a, he would begin seeking employment. This could involve a lowering of information costs through some form of government financed program or the payment of a subsidy for undertaking search activity. With respect to the latter solution the temptation is to suggest increasing unemployment benefits. In the light of our analysis the effect of this is however ambiguous. While unemployment benefits may be regarded by some as a search subsidy, causing the real wage constraint to rotate upward, they will also represent an alternative income to market income, wages, and if pushed high enough may be viewed as a profitable alternative to finding employment. These two opposing effects are best illustrated with respect to the unemployed individual, already discouraged, but whom is not currently eligible for unemployment benefits. Such an individual is represented in Figure H. Given his existing nonmarket income and the extent to which his potential real wage has declined, this person maximizes his satisfaction by not searching. If he now became eligible for the unemployment benefit two things would happen. First, the budget constraint with which he is faced would rotate upward to the extent that unemployment benefit reduces the cost of search. If it rose to $Y_2 L_0$ then, in the absence of other considerations, the individual would resume search. However receipt of the unemployment benefit also raises the individual's net market income. In the case considered, should the rise be above OB, then the individual would remain a discouraged worker, although, since registration is a requirement for benefit receipt, he would no longer be one of the "hidden" unemployed. We will return to the disincentive effects of unemployment benefits in the next section of this chapter.

The second solution presented for lowering the number of discouraged workers involves a training program to upgrade the skills of the individuals who have dropped out. If the training program is successful, it will shift the individuals wage distribution to the right. That is, the training enhanced skills of the individual will, command on average a higher wage than his pre-training skills. In Figure A this can be represented by a shift of XX' to YY'. If we assume that the returns from unemployment remain fixed at ε_0, the individual will now drop out only if $c > c'_0$. However again, the outcome of embarking on policy measures of this nature are uncertain. If an individual's skill level has been augumented it does not seem reasonable to assume that his return from remaining unemployed, ε_0, will remain constant. The unemployed worker may now expect to obtain jobs offering considerably greater returns than previously was the case and may therefore set his acceptance level accordingly. In terms of Figure A, if the acceptance level is now set above ε_a the individual will remain a discouraged worker.

2.7 Discouraged Worker and Tests of Search

Our analysis of the discouraged worker, in a search theoretic framework, makes three predictions which can be utilized in tests of the concept of search. First, the theory predicts that the number of discouraged workers will rise as economic conditions deteriorate. Second, specific groups within the labour force are expected to contribute unproportionately to those identified as discouraged workers. Finally the number of discouraged workers is expected to be inversely related to movements in the costs of search and the level of education and training of the work force.

3. UNEMPLOYMENT BENEFITS AND THEIR IMPACT ON SEARCH ACTIVITY

3.1 Introduction

Popular attitudes to unemployment and unemployment benefits in all countries are influenced greatly by the widespread belief that benefits act as a serious disincentive to work. The response of economists to this issue has been varied. On the one hand search theorists argue that the introduction of, or a rise in, unemployment benefits will cause workers to set a higher reservation wage which implies a longer expected period of frictional unemployment.[6] On the other hand some economists argue that it is not an extension of search that results but rather an increased consumption of leisure.[7] In the first case, increased time spent in search may be socially productive if it results in a better match of workers with jobs than would otherwise have occured. However, such public benefits are reduced to the extent that the extended search is undertaken less intensively. In the second case, the extra time spent unemployed is socially unproductive and amounts to subsidized leisure.

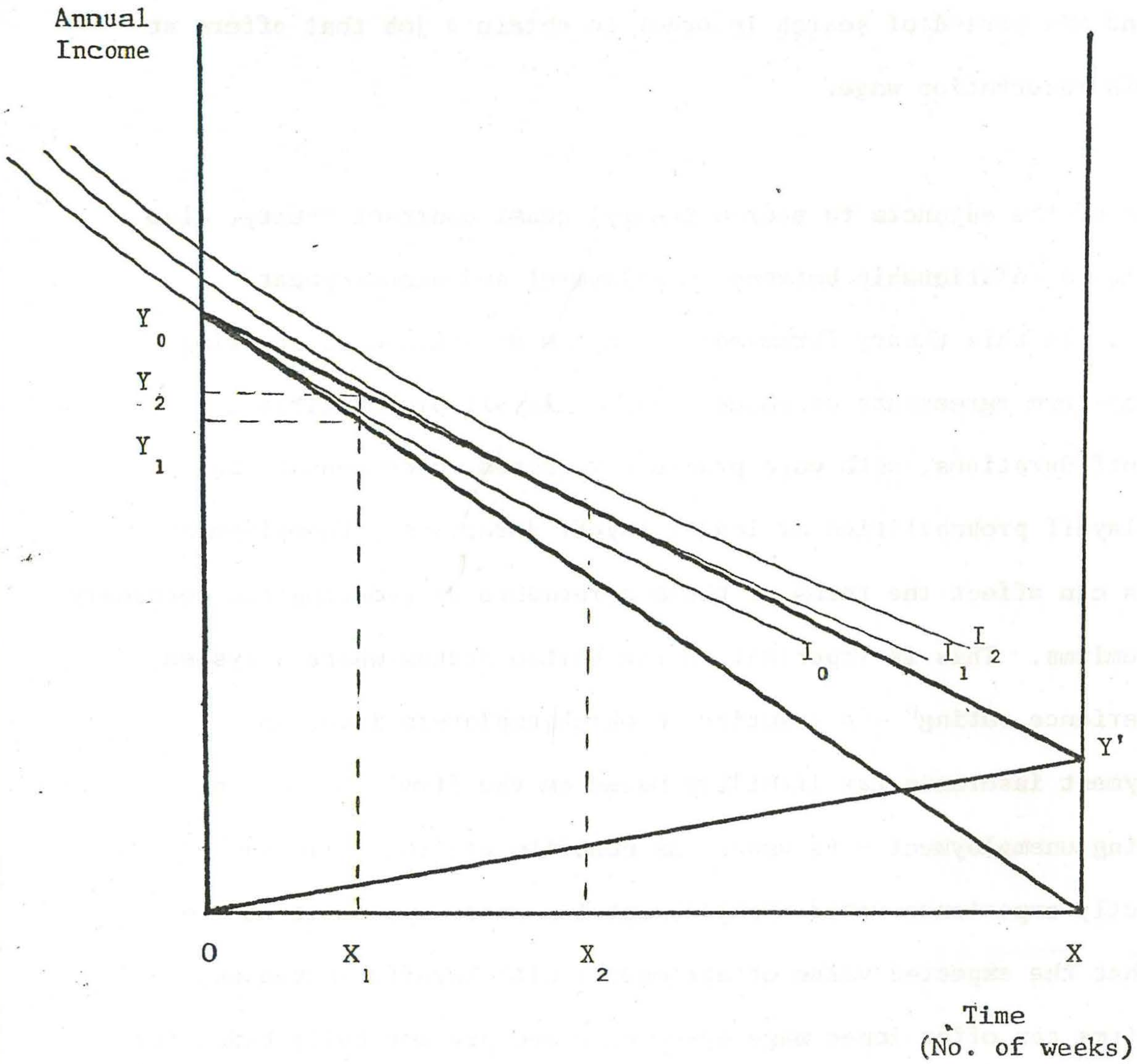
3.2 Unemployment Benefits and Search

In the simple search model, the impact of unemployment benefit depends on the way it influences the reservation wage. As Atkinson (1981) has pointed out, it is quite conceivable that the reservation wage is independent of the benefit level because employment may be preferred to unemployment and no financial advantage to working may therefore be necessary to induce acceptance of a job offer. If the reservation wage is not affected by the level of benefits, then that is the end of the matter. However if the reservation wage is an increasing function of the benefit level then a rise in benefits consequently means that an unemployed worker is more likely to refuse a job offer or to look less intensively for a job.

If all unemployment is voluntary this response will result in an increase in unemployment. If, however, we admit the possibility of demand-deficient unemployment then, as we have previously noted and as Atkinson (1981) points out in the current context, whether this supply side change causes an increase in unemployment depends on the conditions of demand. If demand is low, the individual may not receive any job offer at all, in which case the rise in his reservation wage is irrelevant. However, if demand is not a constraint on employment, the rise in the reservation wage may well cause a worker to quit his job or extend his period of search in order to obtain a job that offers at least his reservation wage.

One of the adjuncts to search theory, quasi-contract theory, also postulates a relationship between unemployment and unemployment benefits. In this theory firms and employees are viewed as entering into long-term agreements on wages, hours, layoff probabilities, and layoff durations, with wage premiums required to compensate for higher layoff probabilities or longer layoff durations. Unemployment benefits can affect the terms of these agreements by reducing the necessary wage premiums. This is important in the United States where a system of "experience rating" - a practice in which employers incur an unemployment insurance tax liability based on the firm's history of generating unemployment - is used. As benefits are raised in an imperfectly experience-rated unemployment insurance system it can be shown that the expected value of agreements with layoffs increases, since firms can offer lower wage agreements and are not fully taxed for the benefits paid. In addition the higher benefit allows the firm to substitute longer duration layoffs for a higher level of short duration layoffs. Thus higher levels and longer durations of unemployment are predicted by this theory.

FIGURE I. Unemployment Benefits and the Labour/Leisure Choice: The Simple Model (Annual Horizon)



One of the significant aspects of this theory is that it represents an attempt to give attention to the response of firms to changes in the level of unemployment benefits. However it is based on a concept, that of experiencing-rating, which is unique to the United States. The relevance of the theory to other countries, and to New Zealand in particular, is minimal and consequently we will not pursue further the issues raised.[8]

3.3 Unemployment Benefits and the Labour/Leisure Choice

The basic model of the effects of introducing unemployment benefits on the choice between work and leisure of an average worker (in the sense of the mean characteristics of the total labour force) is summarised in Figure I. The model assumes a relatively sophisticated market for labour in which workers base their decision on a consideration of the consequences of various actions available to them over a given time period (e.g. one year). The model is similar to that developed by Grubel *et al*. (1975) although substantially different institutional arrangements for the support of the unemployed in New Zealand necessitate some modification of the original analysis. Unemployment benefit is typically paid on a weekly basis in New Zealand hence the number of weeks per period (one year) are measured along the horizontal axis and income per period (annual income) along the vertical. The traditional leisure-income trade-off is XY_0, the slope of which is determined by the individual's wage rate. Our average worker is assumed to have a potential income of OY_0 if employed for the entire year. (N.B. statutory and annual holidays and weekends are included in this concept so that paid leisure time - a result of being employed - is accounted for). $0 \rightarrow X$ therefore refers to unpaid leisure. In the New Zealand context no minimum working period is required to establish rights to unemployment compensation and there is no maximum duration of benefit. It is convenient, therefore, to choose as our initial starting point a number of weeks that is equivalent to being fully employed for the year. Thus our average worker's preferences reflected by the indifference map $1_0 - 1_2$ causes him to choose OY_0 income and no days of unpaid leisure in initial equilibrium before the availability of unemployment compensation. I_0 is therefore tangent to Y_0X.

We can now consider the effects of the government introducing an unemployment compensation scheme which, as in New Zealand, is financed out of general government revenue. (Because this particular method of financing is assumed, we need not be concerned with shifts in the XY locus resulting from "unemployment tax" imposed to meet the costs of the benefit scheme.) For expositional ease the following four assumptions are introduced initially. First, the worker can obtain benefits immediately upon becoming unemployed and whether he quits voluntarily, has himself dismissed through alleged misconduct or is involuntarily unemployed. (For New Zealand this assumption is not valid. An unemployment benefit is not payable in respect of the first fourteen days of any period of unemployment, except in special circumstances.

The commission may also postpone, for a period not exceeding six weeks, the commencement of the benefit if the applicant (a) has voluntarily become unemployed without good and sufficient reason, or (b) has lost his employment by reason of any alleged misconduct as a worker). Second, the worker does not have to engage in and document job-search activities to receive benefits. (This assumption is also contrary to the facts as the benefit recipient must report to the local office of the employment service at stated intervals and must be prepared to take employment in jobs to which he is referred by the Department of Labour. A further requirement is that the Department of Labour, in order to check on job search activity, sends unemployment beneficiaries a letter every four weeks. Employers, without vacancies, approached by the unemployed worker, are asked to sign the letter as evidence of contact by the workers. Penalties, which include loss of benefit for four weeks or more, may be imposed for lack of activity on the part of the unemployed or when it is considered that insufficient effort has been made to approach firms with suitable jobs). Third, job search costs are assumed zero. Finally the worker can obtain employment at his previous wage the instant he wants it. (Clearly this assumption cannot be justified especially during periods of high unemployment however it is an assumption that is common to most search theory models.) Under these assumptions the introduction of the unemployment benefit scheme changes the worker's leisure-income opportunity locus from the original XY_0 to $Y'Y_0$ in Figure I. A number of analytically important features of the unemployment compensation plan are reflected in the diagram. First, there is no restriction on the number of weeks the unemployed may be in receipt of benefit. Thus if the worker is unemployed for the full fifty-two weeks he will receive an income of XY' from the benefit. (This income may be interpreted to mean benefit plus allowable part-time earnings during the period of unemployment. The relevance and treatment of such earnings will be considered presently.) As the number of weeks of unemployment falls so does income from the benefit. If no unemployment is experienced in the year no benefit income will be obtained. An income opportunity locus from unemployment benefit is therefore given by Y'O. At any combination of employment and unemployment the income of the individual will be given by the addition of benefit income and employment income as indicated by the locus Y_0Y'. Second the slope of the line Y_0Y' relative to that of XY_0 measures the ratio of compensation benefits to income from employment per time period. Finally, without the benefit plan OX_1 leisure costs $Y_0 - Y_1$ income. With the plan it costs only $Y_0 - Y_2$.

In this simple model it follows that, if leisure is a normal good, the introduction of the unemployment benefit induces the average worker to consume added amounts of leisure per time period. The quantity consumed is an increasing function of the ratio of benefit to income from employment. The amount of increased leisure consumed is equivalent to induced unemployment. (In Figure I this will be equal to $O-X_2$, the employment level corresponding to the tangency of the highest attainable indifference curve with the new opportunity locus.) Having established the scheme the government can encourage further consumption of leisure

FIGURE J: The Inducement Effect of Unemployment Benefit on Individuals not Previously in the Labour Force.

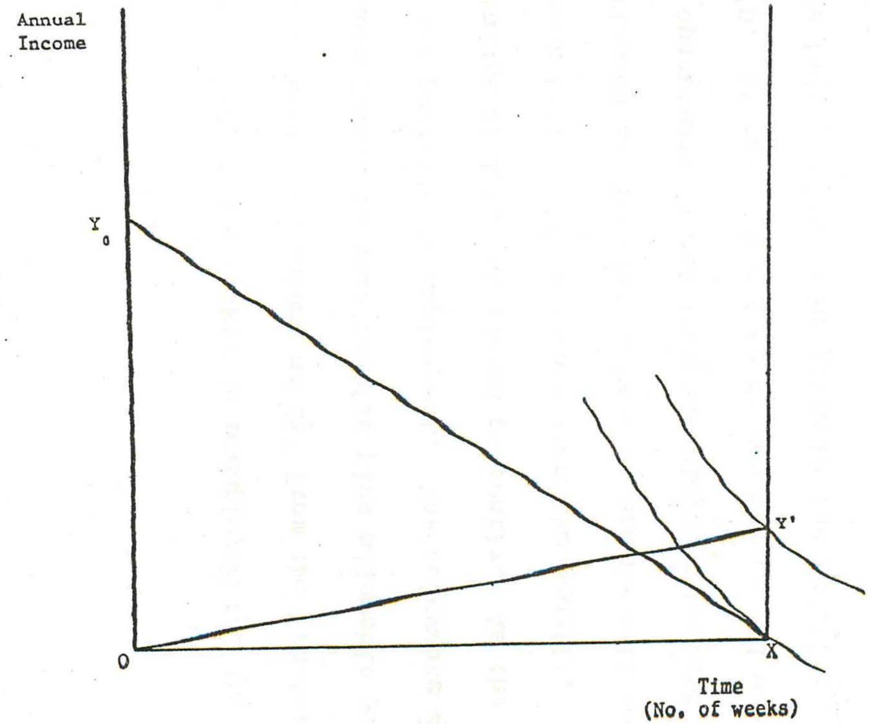
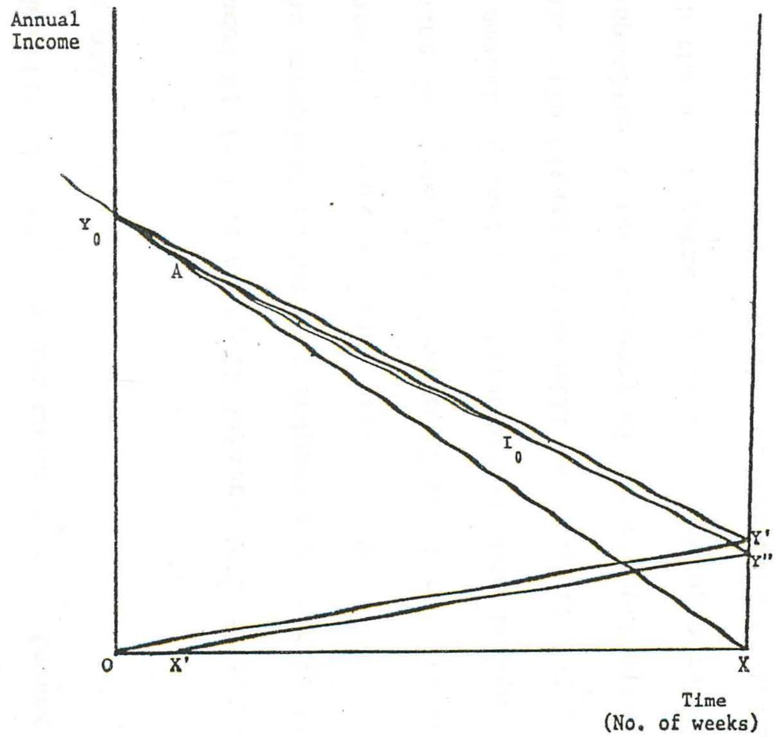


FIGURE K: The Inducement Effect When a Period of Waiting is Required.



(higher unemployment) by increasing the benefit payment relative to the wage rate confronting the worker. Each such alteration will affect the slope of Y_0Y' and consequently have an impact on the amount of unemployment reported as employed workers find it optimal to initiate their own "unemployment" for some period of time or because unemployed workers extend their period of unemployment.

The model can also be used to show how the introduction of the unemployment benefit programme may induce persons to join the labour force and then become unemployed. For example the indifference map of an individual may be such that faced with an opportunity locus of Y_0X (as in Figure J) the individual may choose not to become employed. Such a case may describe a housewife, teenager or retired person where tastes and wage rate are such as to make unpaid leisure preferable to working. Clearly, after the introduction of unemployment benefits it now becomes attractive for such an individual to register as unemployed.

We now return to our assumptions and show how relaxing each of them will affect the analyses. Removing the first assumption that workers can immediately obtain benefits on becoming unemployed, will shift the opportunity locus in terms of unemployment benefits alone down from Y'O to Y"X' (Figure K) and generate a new, overall opportunity locus facing the individual of Y_0AY''. The distance OX' represents the period required to be spent in unemployment before benefit payment commences. This modification makes only a marginal difference to the previous analyses. The same is true for the impact of the removal of

FIGURE L: The Impact When Job Search Evidence is Required.

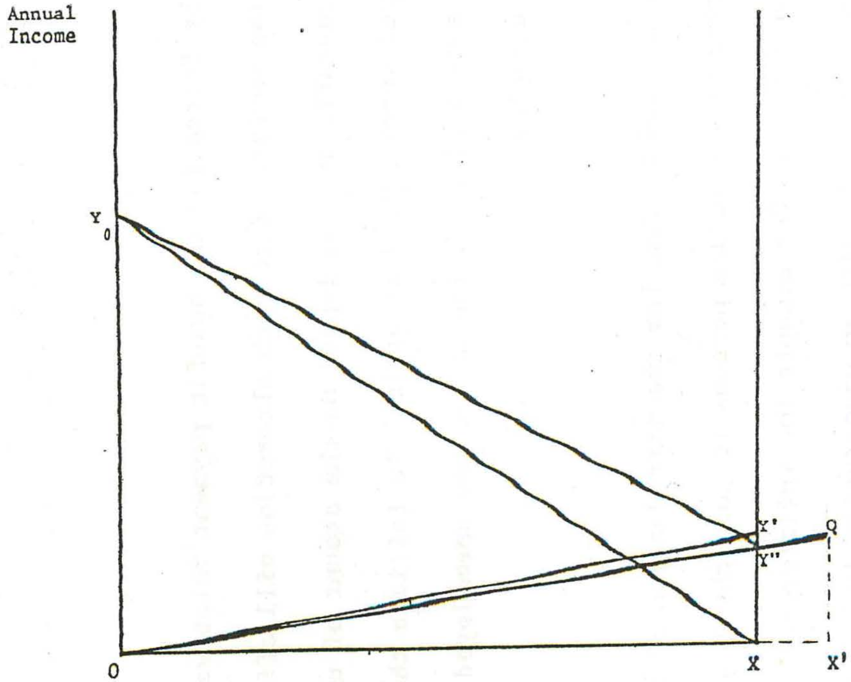
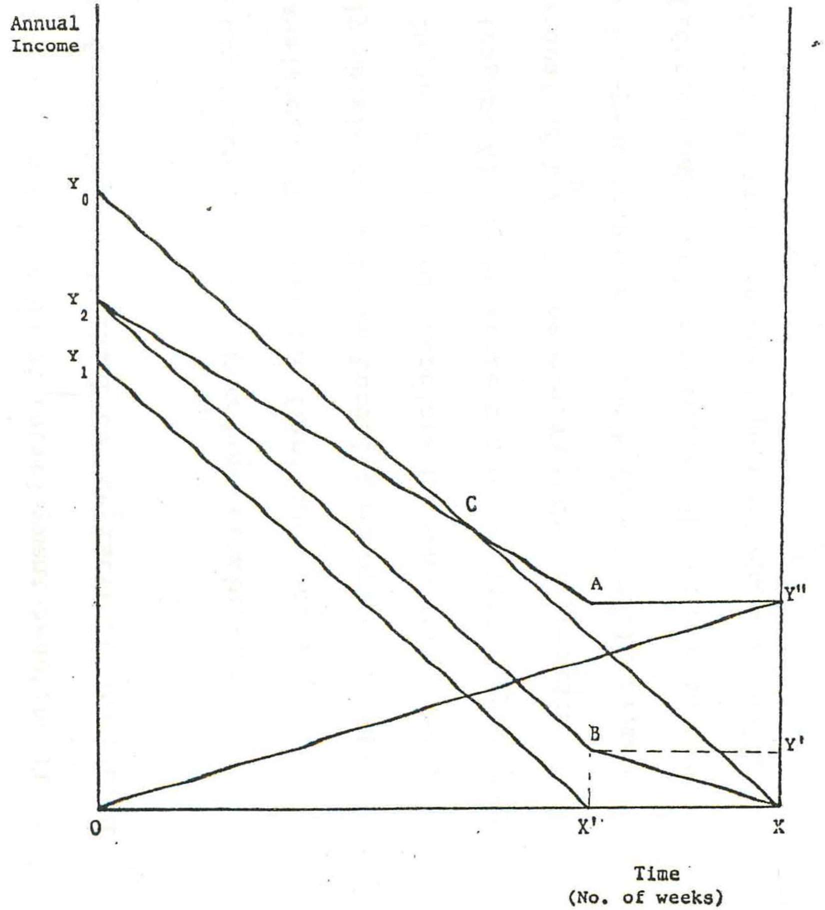


FIGURE M: The Impact of the Inability to Instantaneously Obtain Employment at the Original Wage.



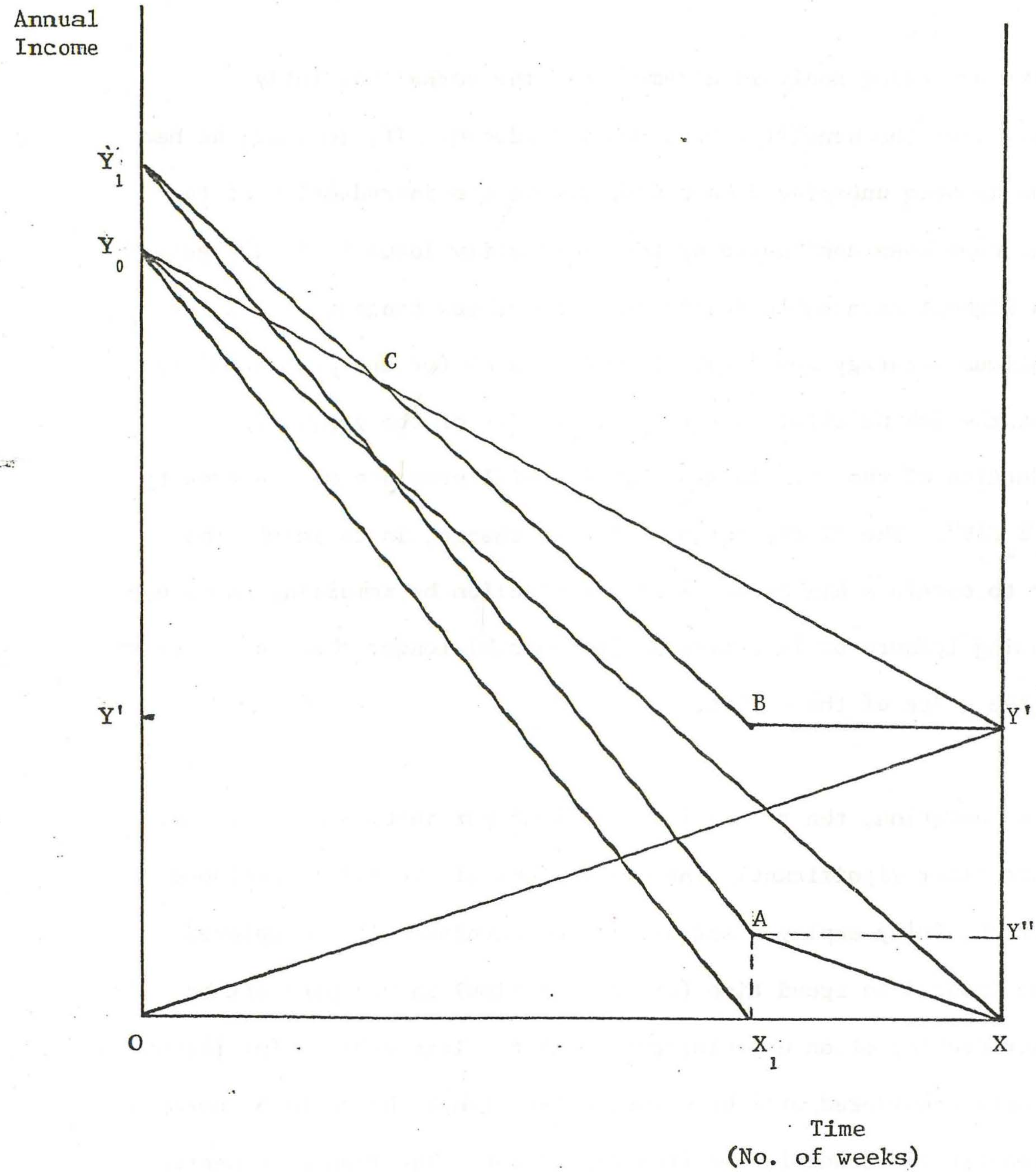
the second assumption; that benefit receipients do not have to engage in documented job search. Assume that fifty-two weeks of unemployment involve a benefit receipt of \$XY' (Figure L) and that to obtain this benefit two weeks, or XX', are used to meet the Department of Labour's requirements. Thus benefit receipts would be XY' or X'Q, unpaid leisure OX and the time used in meeting the search requirements XX'. If we now assume that a portion of each week unemployed must be spent generating the required evidence of search the benefit locus becomes OQ. Since in reality OX is the maximum amount of time available XY" becomes the maximum amount of benefit obtainable. The new benefit locus OY" incorporates the costs, in time, of maintaining eligibility for the benefit. From this point the analysis proceeds as previously with the new opportunity locus facing the individual being Y_0Y''. In summary we can say, ceteris paribus, that the quantity of induced unemployment is a decreasing function of the time required for job search and documentation.

Removing the fourth assumption that unemployed workers can instantly obtain jobs, will have a more important affect on the analysis as it is likely to change markedly the labour market response of the employed individual to the introduction of an unemployment benefit. In Figure M the employed worker is initially faced with an opportunity locus given by the wage line, of XY_0. If we relax the fourth assumption the individual who leaves his existing job will not be able to obtain an identical one immediately. Some time will have to be spent in searching for a new position. This can be depicted as a movement down of the wage line XY_0 to $X'Y_1$. X-X' being the time necessary for search. Hence an individual who chooses to leave his job, remains unemployed for a short while, taking advantage of the introduction of the unemployment benefit, and then seeks to be re-employed will be confronted with an opportunity locus given by Y_0CAY''. Such an opportunity locus is derived from the following analyses. Throughout the period of search, X-X', the unemployed worker will obtain unemployment benefit of an amount XY'. This raises the wage line to Y_2B. Having undertaken the search and obtained the job the worker must now decide whether or not to accept it. If he does not his annual income will be XY". This represents twelve months of unemployment benefit. If he has not searched for the period X-X', after leaving his job, he will not have obtained any offers and again his annual income will be derived solely from the unemployment benefit. Hence we establish that portion of the budget constraint given by AY". If, having obtained a job, the worker decides to work for the remainder of the year, he can earn a maximum income of Y_2. However, he may decide to work only part of the year and spend the remainder on the unemployment benefit. The possibilities for mixing work with unemployment-benefit subsidized leisure is given by Y_2CA. Thus, as previously stated, the opportunity locus confronting the individual will now be Y_0CAY''. It is now less likely that the worker concerned will choose to become unemployed even with the introduction of a very generous benefit programme. Choosing to become unemployed would require that the indifference curve tangent to the original wage line at, Y_0, pass through the new opportunity locus to the right of point C. We can conclude from this analysis that, other things being equal, the longer the period of search required to obtain a new job, the less likely the worker is to quit his existing job.

The preceding analysis assumed that the worker was fully employed when the benefit scheme was introduced. If, in fact, he had originally been unemployed he would, before the introduction of the scheme, have been confronted by the opportunity locus Y_1X' in Figure M. If his highest attainable indifference curve was tangent to Y_1X' at Y_1 his optimum strategy would have been to search for the period XX' and work at the job he obtained for the remainder of the year. The introduction of the unemployment benefit will generate on opportunity locus Y_2CAY''. The likely outcome of this change, is to permit the worker to obtain a higher level of satisfaction by remaining unemployed (consuming leisure or investing in job search) longer than is necessary given the state of the market.

In summation, the relaxation of all of our initial assumptions, does not alter significantly the predictions of the model developed. Some of the fully employed and all of the involuntarily unemployed will be induced to spend time (or further time) in unemployment by the introduction of an unemployment benefit. This effect, for reasons previously considered, will be stronger the higher the ratio of unemployment benefit to earned income from employment. The theory presented

FIGURE N: Search and the Impact of Unemployment Benefits.



therefore provides a theoretical underpinning for the concept of induced unemployment. Each change in the level of benefits, incomes from employment remaining constant, alters the slope of a large portion of the opportunity locus facing the individual (because of changes in search costs) and is therefore likely to produce an impact on the level of unemployment.

3.4 Benefit Induced Search

To this point we have considered primarily increases in unemployment that result from an induced substitution of leisure for work. The model can be expanded to allow for the possibility of "productive" search being induced by the rise in, or the introduction of, unemployment benefits. For ease of exposition the simple model, presented in Figure I, will be utilized. In Figure N an individual is employed for a full year at a job offering a wage represented by the slope of Y_0X. He expects that he could gain an equivalent income for the year by quitting and searching XX_1 weeks for a job offering a higher wage of Y_0X_1. If the worker were to be induced to quit his existing job and search for the job offering the higher wage the economy would benefit in the future from having the worker more productively employed.

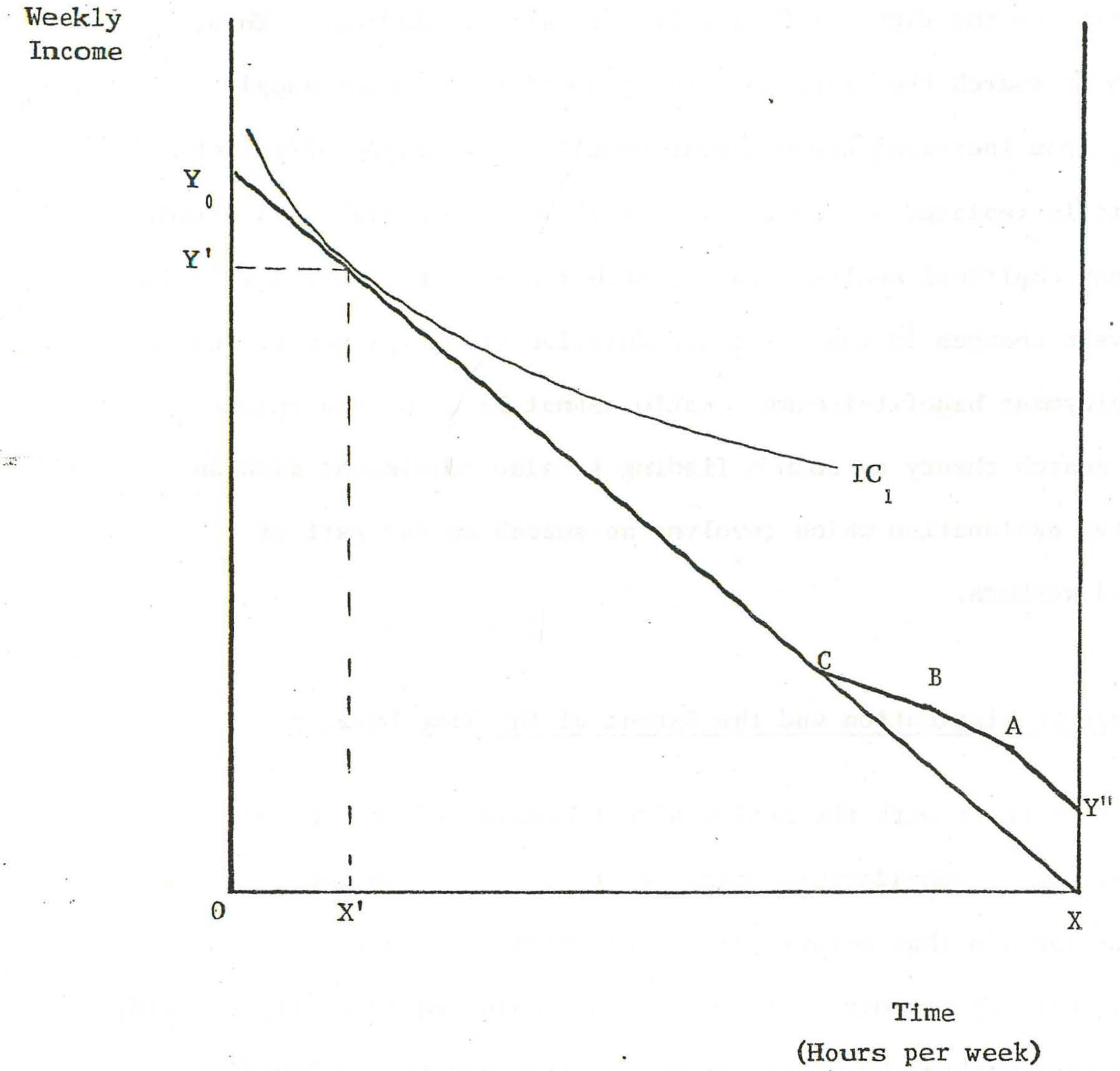
The introduction of an unemployment benefit will, with respect to his existing job, generate a budget constraint of Y_0Y' as previously explained. We must now consider the impact of the introduction of an unemployment benefit now that an alternative, higher paid, job exists which could be obtained after a period of search. An individual searching XX_1 weeks would receive total unemployment benefit payments, for this period of search, of $XY'' = X_1A$. (Where the absolute slopes of XA and OY' are equal) Maximum obtainable income for the year is raised, by this amount, from OY_0 to OY_1. If the individual chooses to quit the lower paying job and search long enough to obtain the higher paying job he is, by no means, confined to working in that job for the remainder of the year and, as before, may choose to enjoy a period of unemployment - benefit subsidized leisure. If he chose to do no work at the new job his income would be $XY' = X_1B = OY'$. If he chose to work the remainder of the year his income would be OY_1. Income from any intermediate combination of work and leisure with respect to the new job can be read from the line connecting Y_1 and B. Thus considering the possibilities provided by both jobs and the availability of the unemployment benefit the budget constraint confronting the individual will be Y_1CY'.

Although our analysis is simplified in that it attributes equal utility to search time and work time and ignores both the benefits resulting from search that extend beyond twelve months and the importance of the continuity of an individuals employment history to prospective employers, it enables us to draw two important conclusions about the relationship between unemployment benefit and search. First the assumption of search theorists that the introduction of, or increase in, unemployment benefits will act as a subsidy to productive search is only partially correct. If the highest attainable indifference curve attains a corner solution with Y_1CY' at the point Y_1, the introduction of the unemployment benefit will induce only search. If, however, it is tangent to the section of the budget constraint between Y_1 and C, both search and increased leisure will be induced. If the highest attainable indifference curve is tangent to the budget constraint at any point to the right of C only leisure will be induced. Thus, the claim by search theorists that the reduction in labour supply resulting from increased unemployment benefit is socially efficient because it is replaced by productive search must be heavily qualified. Second, any empirical analyses which establishes a statistical relationship between changes in the level, or duration of unemployment, and the unemployment benefit-income ratio cannot be used as a unique proof of search theory as such a finding is also consistent with an alternative explanation which involves no search on the part of unemployed workers.

3.5 Worker Sophistication and the Extent of the Time Horizon

One difficulty with the analysis just considered is the fact that it assumes a considerable degree of foresight by workers. It is not at all certain that workers are as far sighted as a model expressing utility maximization over a year would require. If, instead, we assume that workers have neither the ability nor the inclination to undertake an adjustment of their allocation of time so as to maximise their utility over the year we can show that only very large variations in the ratio of benefit to income will induce unemployment.

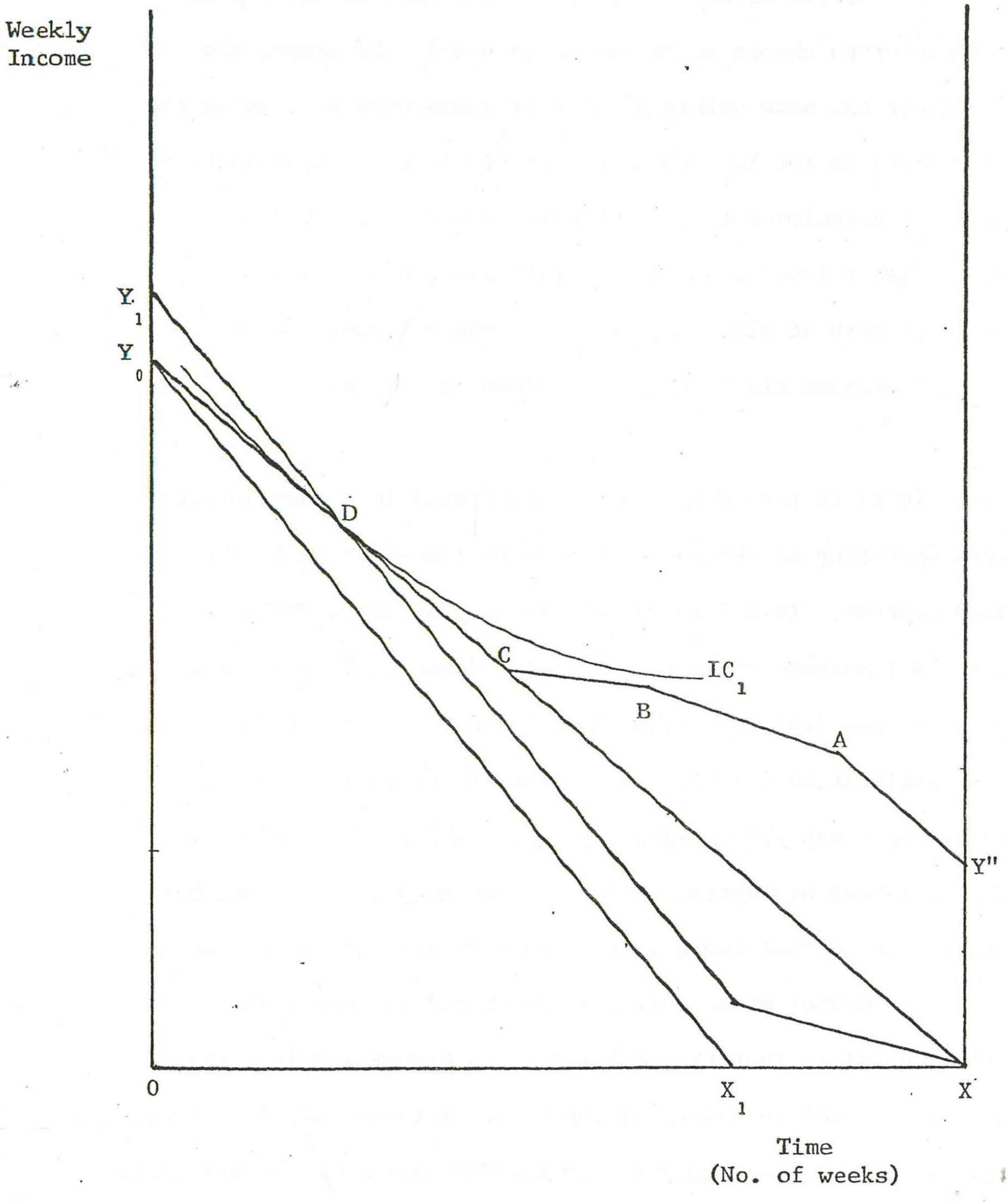
FIGURE 0: Unemployment Benefits and the Labour/Leisure Choice: The Simple Model (Weekly Horizon).



Such a model would assume that the reaction of workers is much less far sighted than previously was the case. In Figure O the horizontal axis now presents the number of hours per week and the vertical axis the weekly wage. Y_0X is the budget constraint (determined by the wage rate) and it is tangent to IC_1 showing that the worker will choose to be employed for XX' hours and earn OY' income. The introduction of a benefit scheme for the unemployed along the lines currently operating in New Zealand would generate a new opportunity locus of the form $Y''ABCY_0$. The distance XY" represents the maximum value of the benefit payment. Under the New Zealand system a small income can be earned before any loss of benefit accrues (currently up to \$25). Once the threshold level is reached the benefit is reduced by some proportion of every extra dollar earned, (currently 8¢ per 20¢ of income up to \$40, represented by the distance AB and 16¢ per 20¢ of income beyond \$40 represented by the line BC) until no benefit at all is obtained. Unlike the outcome predicted by the previous model the introduction of unemployment benefit may now have no effect on the desired amount of employment. It is important to notice the difference between the present model, based on a time horizon of one week, and the previous analysis prefaced on a time period of fifty-two weeks. In the first model, the introduction of the unemployment benefit altered the budget constraint facing the worker, in particular the unemployed worker, over a very large range and in close proximity to its contact with the highest attainable indifference curve. Thus, even for small changes in the ratio of benefit to income, increases in the benefit could have been expected to encourage the worker to take some extra leisure or carry out job search in the form of unemployment. In the second model this is no longer the case. The budget constraint in the range of Y_0C is unaltered and unless the "new" portion of the opportunity locus falls on a higher indifference curve than IC_1 there is no incentive for the worker to leave his job (nor indeed for an unemployed worker to choose to remain unemployed). As drawn, the level of benefit can move within a sizeable range without causing the opportunity locus to cut IC_1 and make a higher level of satisfaction attainable. If unemployment benefits were raised to a level that would make a higher level of utility attainable the employee would prefer to do no work at all. (Apart from a minimum amount of part-time work that enables him to earn the allowable income).

An additional factor works against inducement into unemployment for workers operating on the basis of a short time-horizon in the New Zealand context. This involves the relaxation of our first assumption, that workers can obtain benefits immediately upon becoming unemployed. In New Zealand a stand-down period of fourteen days from the date of application for the single benefit currently operates. Such a requirement may only marginally affect the decision of a worker who is making his decision from a long-run point of view, but it effectively means that there is no gain from quitting to become unemployed for a worker whose decisions are based on immediate needs. However it is possible that the worker who has become involuntarily unemployed, and therefore undergone the appropriate period of waiting, will choose to remain unemployed if the benefit structure is such as to maximize his short-run satisfaction.

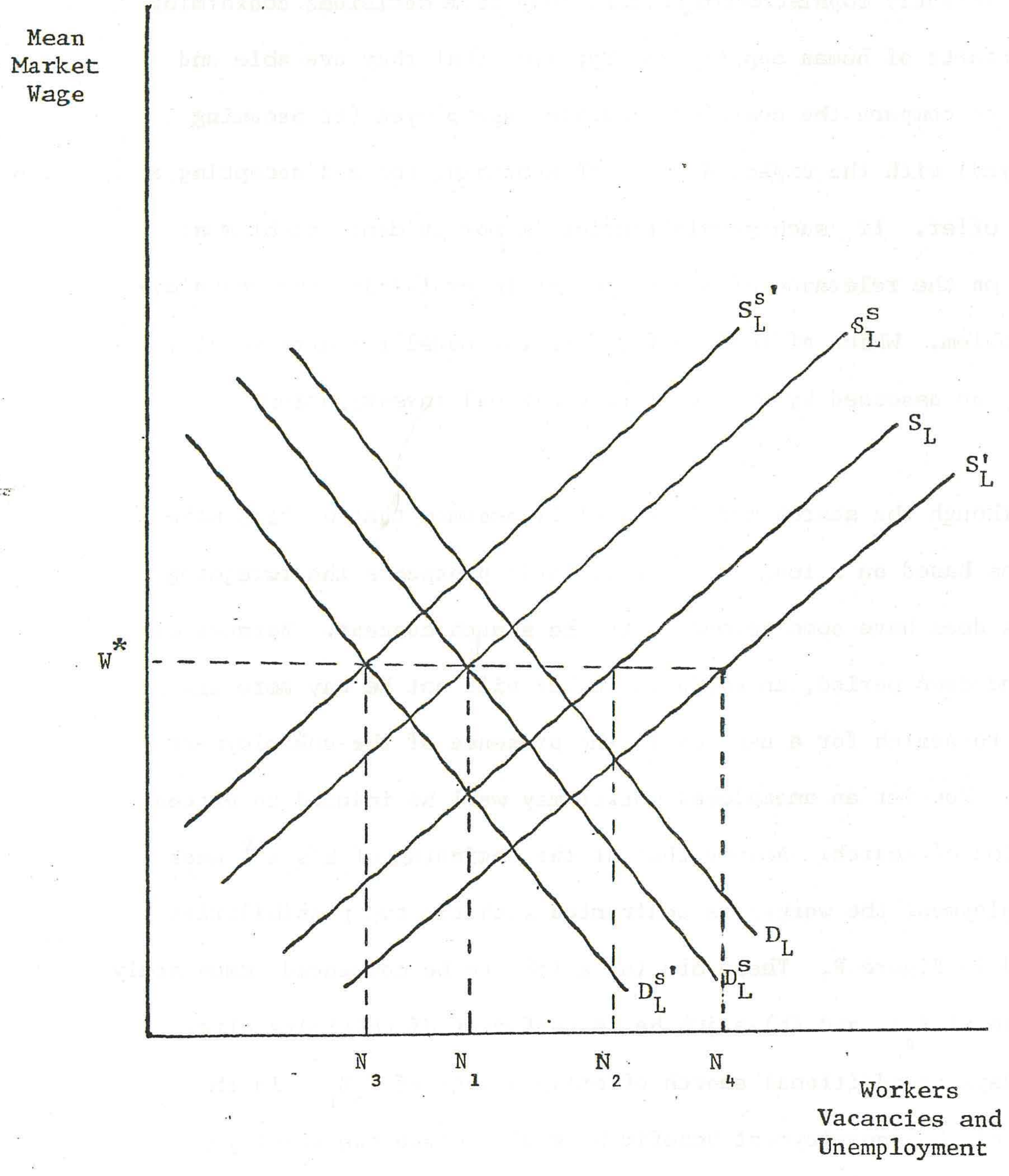
FIGURE P: The Effect of Unemployment Benefit on an Unemployed Worker with a Short-Time Horizon.



If this interpretation is correct there are important repercussions for those theories of unemployment based on search analysis. All such theories assume, either implicitly or explicitly, that workers are sufficiently sophisticated to make long term decisions conforming to the tenets of human capital theory; i.e. that they are able and willing to compare the costs of remaining unemployed (or becoming unemployed) with the expected gains of searching for and accepting a new job offer. If such sophistication is not evident, doubt must be cast on the relevance of search theory in explaining the unemployment problem. Which of the two forms of the model reflects reality can only be assessed by an appeal to empirical investigation.

Although the search model implicitly assumes that workers make decisions based on a long-run view of their prospects the foregoing analysis does have some relevance to the search concept. Because of the stand-down period, an employed worker will not be any more likely to quit to search for a new job in the presence of the unemployment benefit. However an unemployed worker may well be induced to extend his period of search. Assume that at the beginning of his x^{th} week of unemployment the worker is confronted with the two possibilities depicted in Figure P. These are (a) a job, to be commenced immediately at a wage of Y_0X and (b) a job he is confident of obtaining after $X - X_1$ days of additional search offering a wage of Y_0X_1. In the absence of the unemployment benefit he would choose the first job offered. The presence of the unemployment benefit however, produces

FIGURE Q: A Macro Model of the Impact of Unemployment Benefits.



a budget constraint of Y_1DCBAY'', inducing the unemployed worker to maximize his utility by extending slightly his period of search and obtain the higher paying job. Thus, for an individual with a short-run time horizon, we predict an increase in duration of a spell of unemployment as benefits rise.

We turn now to the macro-level implications of changes in the replacement ratio on unemployment.

3.6 The Impact of Unemployment Benefit on Aggregate Unemployment

To explain the impact of unemployment benefits at the macro level we will again use the model originally developed in Section 2.6 of Chapter 3. In Figure Q S_L is again the measured aggregate supply of labour curve and D_L the measured aggregate demand for labour curve. Similarly, S_L^s depicts the number of workers actually employed at each wage (as opposed to those stating their availability) when demand is not a constraint and D_L^s represents the number of jobs filled (as opposed to the stated number of available jobs) when supply conditions are not a constraint. To the extent that there is a positive relationship between unemployment and unemployment benefits it may be depicted at the macro level in one or both of the following ways. First, if the response is that predicted by search theorists, S_L^s will move to the left when unemployment benefits are raised because of the formation of higher reservation wages which (a) lead some workers to quit existing employment to search for a job offering a higher wage and (b) cause an extension of search time by those already unemployed for similar reasons. Second, if the response involved a substitution of leisure for work, S_L^s will move to the left because the increased subsidy to leisure will cause the unemployed to extend their spell and some of the employed to quit. In either case, before the increase in the unemployment benefit, with a real wage fixed at W^*, existing unemployment is equal to N_1-N_2. An increase in the unemployment benefit would shift S_L^s to $S_L^{s'}$ raising the level of unemployment to N_3-N_2.

In the foregoing it is important to recall that S_L represents the measured supply of labour. To this point, we have assumed that the measured supply and actual supply are synonomous. With respect to the "search" response to a change in unemployment benefits we may continue to do so. However, the leisure substitution response requires that we recognize that in reality the two concepts will not be identical. In this case, although S_L will remain fixed the true labour supply curve will move to the left and although measured unemployment will increase true unemployment will not.

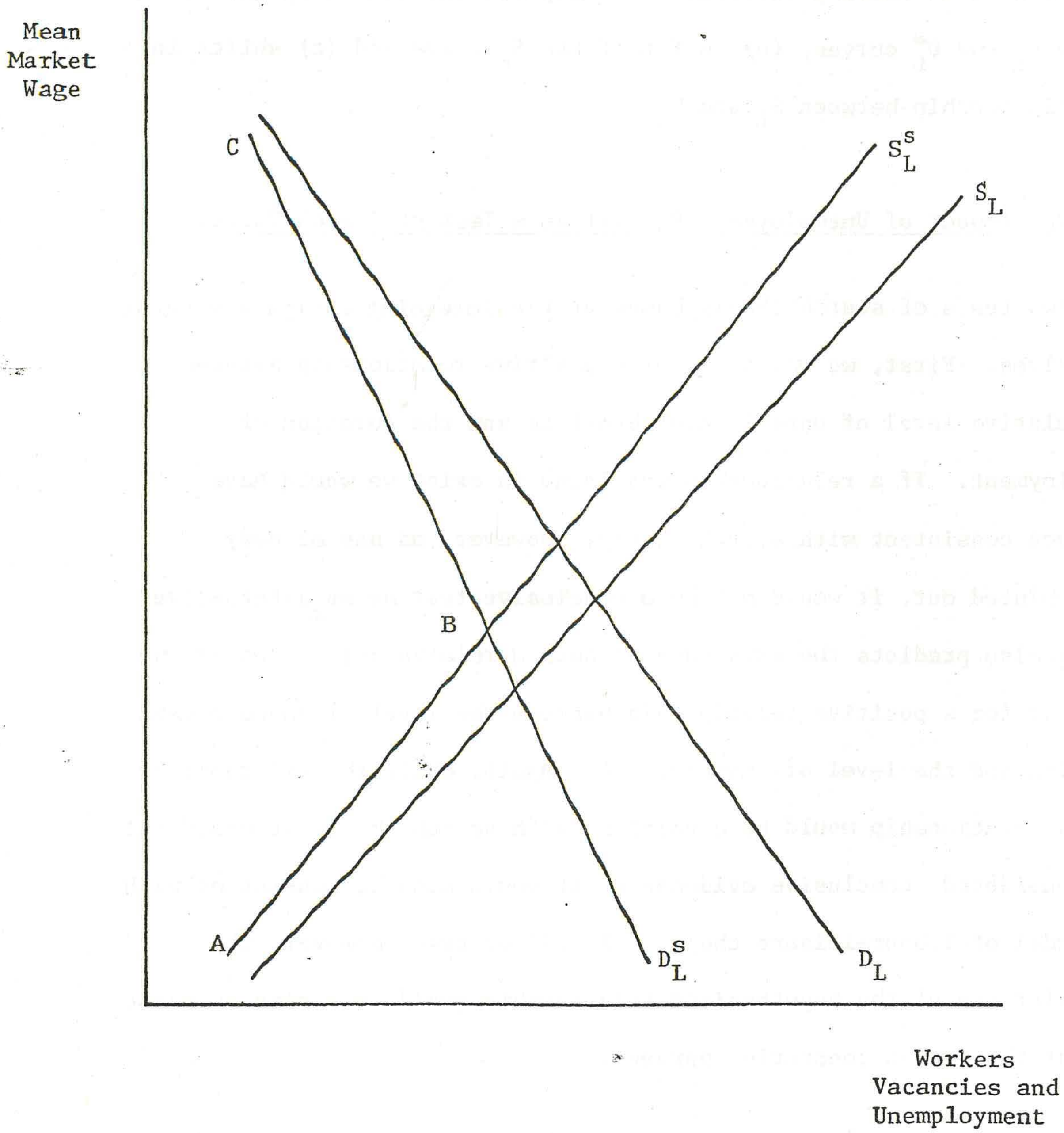
From the diagram we can see that movements in the other curves may generate a similar increase in unemployment. First, the measured labour supply curve S_L may move to S_L' as a result of, for example, increased participation rates. Unemployment would therefore rise from

N_1-N_2 to N_1-N_4, which is equivalent to N_3-N_2 [9]. Second, if the D_L^S curve shifts to $D_L^{S'}$, as a result, for example, of a cyclical downturn, the same increase in unemployment would occur. Thus in attempting an empirical analysis that aims at assessing the impact of changes, in unemployment benefit on total unemployment at the aggregate level, we will need to include variables that capture the effect of (a) shifts of the D_L and D_L^S curves, (b) shifts of the S_L curve and (c) shifts in the relationship between S_L and S_L^S.

3.7 The Impact of Unemployment Benefit as a Test of Search Theory

Two tests of search theory based of the foregoing analysis suggest themselves. First, we may test for a positive relationship between the relative level of unemployment benefits and the duration of unemployment. If a relationship was found to exist we would have evidence consistent with search theory. However, as has already been pointed out, it would not be a conclusive test as an alternative theory also predicts the existence of such a relationship. Second, we may test for a positive relationship between the level of unemployment benefits and the level of unemployment. Again, while the existence of such a relationship would be consistent with search theory it could not be considered conclusive evidence as it would also be consistent with the model of labour-leisure choice. In either case, however, the non-existence of the hypothesised relationship would be strong evidence against the search theoretic approach.

FIGURE R: Development of the Employment Curve.



It should be remembered that tests of search can be placed into two categories; tests of the concept of search and tests of the impact of search on unemployment. The first test described above would be a test of the former kind because there is no reason to believe that an increase in the duration of unemployment will necessarily result in an increased unemployment rate. The second test is clearly a test of the latter kind.

4. A SEARCH THEORETIC EXPLANATION OF THE RELATIONSHIP BETWEEN UNEMPLOYMENT AND VACANCIES

4.1 Introduction

A number of writers have suggested that there exists a well established empirical "law" that relates (in a rectangular hyperbolic function) the aggregate vacancy rate and the unemployment rate. With a given market structure it is argued that this relationship remains constant over the cycle.[10] In this section we demonstrate that our macro model incorporating search, developed in Chapter 3, can be applied to produce both a static and dynamic relationship between unemployment and vacancies.

4.2 The Development of a Steady State UV Curve

In commencing our analysis of the steady state relationship between unemployment and vacancies (henceforth the UV relationship) we will first introduce a slight modification to the labour market model presented in Chapter 3. In Figure R, S_L, D_L, S_L^s, and D_L^s have the same

FIGURE S: The Relationship Between EE and the Demand and Supply of Labour.

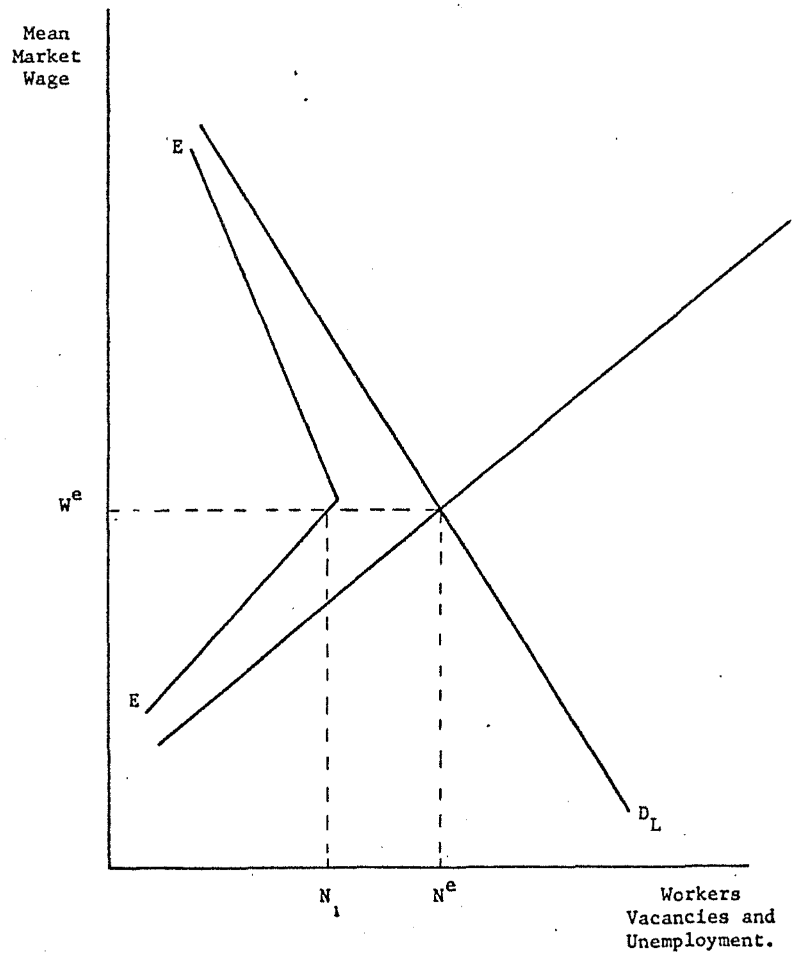
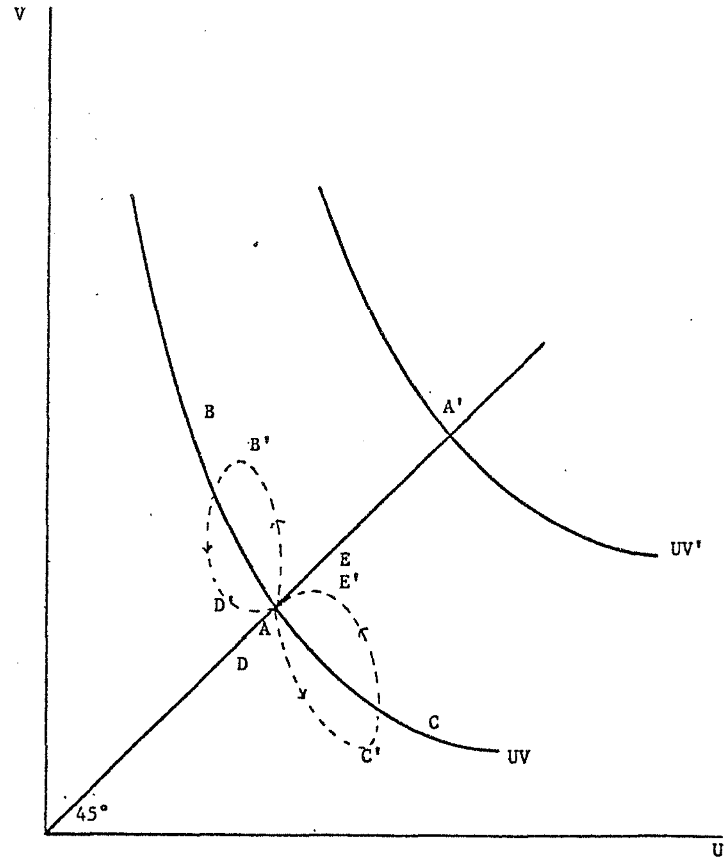


FIGURE T: The UV Curve.

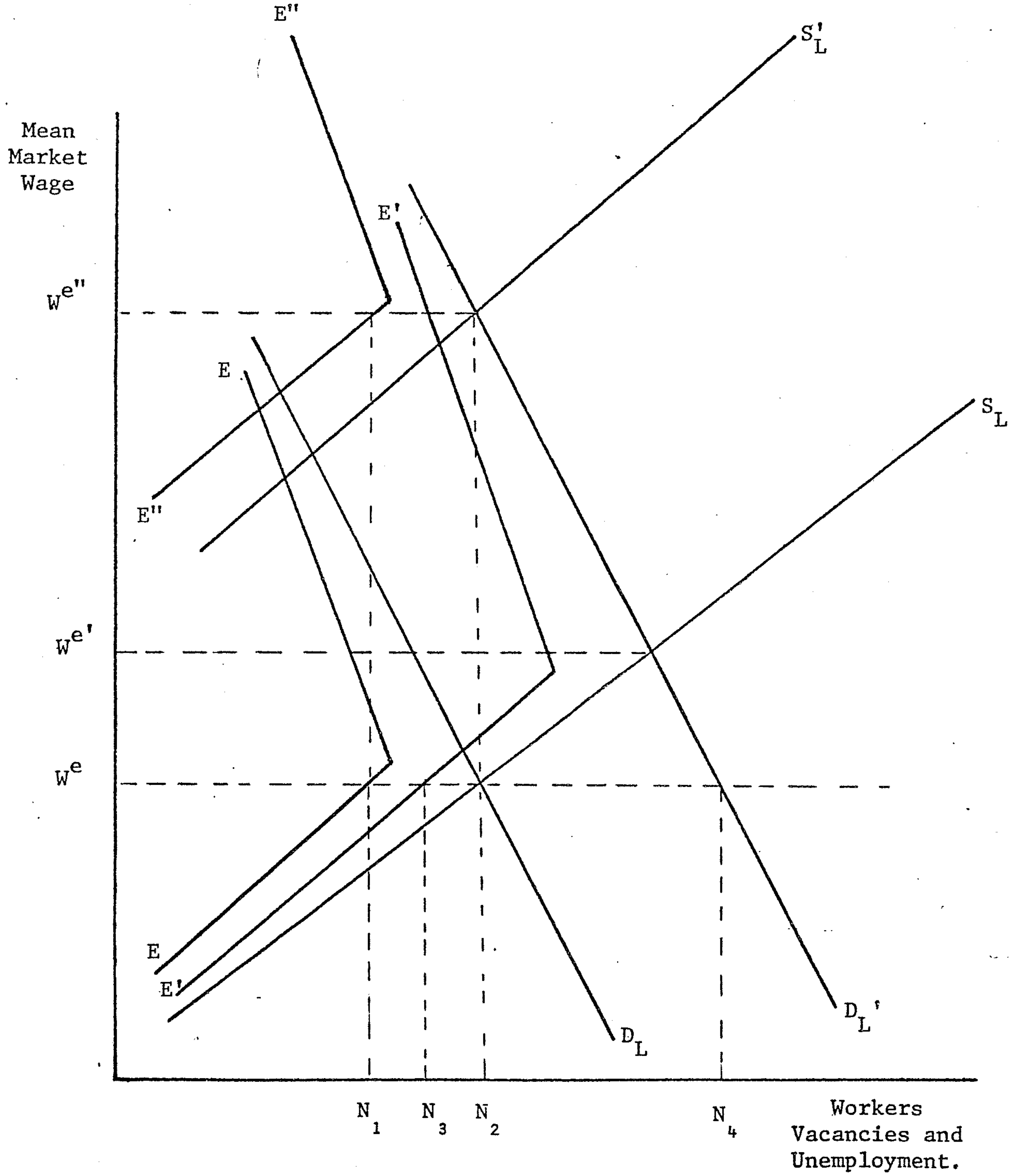


interpretation as previously. Now, however, as we move up the vertical axis the horizontal distance between D_L and D_L^s diminshes while that between S_L and S_L^s increases. This new construction rests on the proposition that, at high wages, employers will have relatively more suitable employees from which to choose, hence they need not search as long as would have been necessary at lower wage rates. Employees, on the other hand, will have fewer jobs from which to choose than at lower wage levels and will therefore take longer to obtain a job offering their reservation wage.

We have previously observed that employment will lie, at any wage, on the S_L^s curve when demand us not a constraint and on the D_L^s curve when supply is not a constraint. ABC, therefore, traces out an employment path which we re-label EE in Figure S. Curves similar to EE have been utilized by other writers in the context of the UV relation. Our presentation emphasizes the search theoretic explanation for its existence.[11]

At the equilibrium wage, W^e, vacancies, given by the horizontal distance between EE and D_L, are equal to the number unemployed, given by the horizontal distance between EE and S_L. As wages are raised above this level vacancies fall as unemployment rises. If wages fall below this level vacancies rise as unemployment falls. Changing wage rates, given that EE, S_L and D_L remain stationary, enable us to map out a curve such as UV in unemployment and vacancy space (Figure T). The 45° line in Figure T passes through the point on UV at which vacancies equal unemployment.

FIGURE U: Adjustment of the Labour Market Over Time.



The foregoing is a simple method of constructing a UV curve. It is however, more enlightening to construct the UV curve as a response to changes in the demand for labour. This is done in Figure U. We have previously examined the initial impact of an increase in aggregate demand on the curves in our model (see Section 3 of Chapter 3). Figure U depicts the impact of such a change in demand as it would be expressed in terms of Figure S. At the equilibrium wage of W^e vacancies and unemployment equaled N_1N_2 initially. The increase in aggregate demand results in an increase in vacancies, to N_3N_4, and a reduction in unemployment , to N_3N_2. This result attains because the rise in aggregate demand has shifted D_L to D'_L and EE to E'E'. A fall in aggregate demand would have the opposite effect. That is, unemployment would rise and vacancies fall as D_L and EE shifted to the left. In terms of Figure T, if wages are held constant, a rise in demand will move us from point A, the equilibrium unemployment and vacancy level to point B. A fall in demand will move us to point C.

4.3 The Dynamic Relationship Between Unemployment and Vacancies

In the real world the rise in vacancies and the fall in unemployment, predicted above, cannot occur instantaneously. Although both will take time, it is generally considered that firms will be more readily able to adjust their demand for labour than their actual employment level.[12] In terms of the UV diagram (Figure T) this will mean that the economy cannot move directly to either B or C from A as demand rises or falls.

Following an increase in aggregate demand we would expect vacancies to rise quickly and unemployment to fall, but more slowly. The path toward B, in Figure T, will be off the UV curve as indicated by the dotted line. Point B, of course, will never actually be reached. Long before the economy has made this adjustment wages will begin to rise. This, as suggested by Figure U, will bring the growth in vacancies and the fall in unemployment to an end. If we assume that the economy is eventually able to attain its new EE curve, E'E', rising wages will result in increasing unemployment and decreasing vacancies. In terms of Figure T we will assume that this takes place after the economy has passed through point B'. The economy will now head toward point D in Figure T which, in Figure U, corresponds to the new equilibrium position, given D_L' and S_L, at a wage of $W^{e'}$. This, like point B, is not a position that can actually be achieved. As previously explained workers will, with some lag, come to realize that increased money wages have been accompanied by price rises and that therefore real wages have not changed. Their response is, at each wage rate, to reduce supply. The result will be a movement of S_L to S_L' and of E'E' to E"E". The equilibrium wage will now be $W^{e''}$ and, because in real terms it is equal to W^e, vacancies and unemployment, in equilibrium, will be N_1N_2 as originally. In Figure T, the movement toward the equilibrium position will take place along the dotted line from D' to A.

A similar analysis is possible for a reduction in demand. It is presented here only in terms of the dynamic path generated in Figure T. A fall in aggregate demand would, in a steady state situation, move the economy from A to C. However a reduction in vacancies would be more readily achieved than an increase in unemployment. The path taken would therefore be from A toward C'. C would not be attained as the eventual reduction in wages would move the economy from C' toward E. However, E would also fail to be attained as the impact of a shift in the labour supply curve would move the economy from a point such as E' back to A.

In each of the above cases, anti-clockwise movements in the observations of U and V are generated. Over a longer period fluctuations in demand will reinforce the anti-clockwise movement of observations through time. For example, as the economy moves from A through B' to D' following an increase in aggregate demand, a cyclical downturn may occur which aborts the movement back toward A and shifts the economy toward C'. Just as the economy is adjusting to the changed circumstances and has moved from C' to E' a boom prevents movement back to A and spurs the economy on toward B'. Thus, over the cycle, our model predicts that the path of observed UV points will be anti-clockwise about the UV curve. This prediction concurs with the real world pattern of UV observations and provides an additional explanation for this movement to those of Hansen (1970), Phelps (1968) and Bowden (1980). The advantage of our theoretical approach is that it is set in a framework that explicitly incorporates the concept of search.

4.4 The UV Relationship as a Test of Search

The UV curve in Figure T represents a locus of temporary equilibria, each point of which corresponds to a given demand for labour at a fixed wage rate. Because both the demand for labour and the wage rate are constantly changing observed UV points will cycle around this line. Thus the locus of temporary equilibria may not be observed as such. In the sense, however, that the observed scatter of UV points is oriented about this curve, it can be referred to as the steady state UV locus.

Point A, as previously explained, represents the position at which vacancies and unemployment are equal. The level of unemployment existing at this point has previously been referred to as the natural rate. A rise in the natural rate of unemployment would require that the entire UV curve shift outward to a position such as UV'. The new, higher, natural rate of unemployment would be that associated with the point A'[13].

The original UV curve, or more particularly, the level of vacancies and unemployment existing at point A, is determined by the distance between the employment curve, EE, and S_L and D_L in the initial equilibrium in Figure S. Three factors may alter this equilibrium position: (a) a shift in the relationship between D_L^s and D_L, (b) a shift of S_L and (c) a shift in the relationship between S_L^s and S_L. Following any of these changes a curve such as UV', with an equilibrium combination of vacancies and unemployment at A', may be generated.[14]

It is change (c) with which we are particularly concerned as it may be caused by a modification of the search behaviour of employees. If more workers quit their jobs in search of a better one, or if the unemployed extend the duration of their search, the natural rate of unemployment may increase and the UV curve may shift to the right. Thus, a test of the hypothesis that increased unemployment has resulted from a change in search behaviour would be to demonstrate that the increase in unemployment has been accompained by an outward shift of the economy's UV relationship. The existence of such a shift would not be conclusive evidence as other factors may explain it, however, the absence of an outward movement of an economy's UV curve would cast serious doubt on the importance of the contribution of search unemployment to the overall unemployment situation.

5 CONCLUSION

In this chapter we have considered some of the important empirical implications of job search theory with a view to using them as a test of the theory. Two types of tests were discerned. First, there are tests of the concept of search as a labour market activity. Second, and more important in the context of this thesis, there are tests of search theory as an explanation for the level and changes in the level of unemployment.

Three tests of the first type were discerned:

(a) Examine the relationship between the asking wage and the duration of unemployment in order to test the prediction of search theorists that the asking wage will decline as the spell of unemployment increases.

(b) Observe the statistics on discouraged workers in order to determine, firstly, if they move pro cyclically, and secondly, if they are comprised mainly of secondary labour force members.

(c) The prediction that the duration of unemployment will rise as subsidies to search increase can be tested by an examination of the relationship between unemployment duration and unemployment benefit payments.

Our discussion also produced four tests of the second type:

(d) To determine if unemployment is primarily confined to short spells, as predicted by search theory, we can examine estimates of the length of unemployment spells and the contribution made to unemployment by spells of varying length.

(e) To assess the importance of frictional unemployment in the overall level of unemployment we could undertake an estimation of various unemployment types.

(f) If the increase in unemployment has been induced by increased subsidization of search through unemployment benefits we would expect to find a positive statistical relationship between the level of unemployment and the value of benefit payments.

(g) The existence of an outward shift in the UV relation would also be consistent with a search theoretic explanation of a rise in the level of unemployment.

Part 3 of this thesis utilizes New Zealand data to conduct tests (b) to (g). Unfortunately the lack of suitable data prevents any attempt at undertaking test (a). This is to some extent compensated for in the next chapter, which reviews overseas tests of search in general, by a detailed coverage of tests of the relationship between the asking wage and the duration of unemployment conducted by other authors.

NOTES

1. See Corry and Roberts (1970) and Gallaway (1969).

2. Gronau (1971 p.299) has pointed out that an economic recession results in a dwindling stream of job offers, downward shift in the job offer distribution and a possible increase in the personal rate of interest (leading to a reduction in the potential value of discounted future earnings).

3. This represents alternative income which is unavailable during employment. A minor modification to the analysis would be required if nonmarket transfer income was assumed available during employment however, the conclusions reached would remain unchanged. Consequently this case is not considered.

4. For simplicity this analysis assumes that every dollar earnt results in a dollar reduction of unemployment benefit. This assumption is modified when considering the effect of unemployment benefits on the level of unemployment. However the modifications, which reflect real world institutional arrangements, are of only minor importance in terms of the current context. Their adoption here would not alter the conclusions reached.

5. Transfer income for these groups can therefore be expected to be higher than that for prime-age males.

6. See Lippman and McCall (1976b p.361).

7. See Hauser and Burrows (1969) and Grubel et al. (1975).

8. For a more detailed analyses of the concept of experience weighting and its relationship to unemployment duration and levels see Feldstein (1976), Baily (1977b), Brechling (1977) and (1981), Halpin (1979), Topel and Welch (1980) and Benham (1983a) and (1983b).

9. Part of the increase in participation, or at least stated participation, may be due to the impact of a rise in unemployment benefits on the propensity to submit fraudulent claims.

10. Amongst the authors who take this stand are Dow and Dicks-Mireaux (1958), Brown (1976), Woodfield (1975) and Hansen (1970).

11. See for example Hansen (1970), Woodfield (1975) and Bowden (1980). Armstrong and Taylor (1981) employ the concept without actually drawing the curve.

12. Hansen (1970), Parikh (1977), Phelps (1968) and Harper (1980) all utilize and discuss this assumption.

13. If the UV curve shifts outwards we may expect the observed scatter diagram to dislocate itself in the same direction.

14. We stress that such changes _may_ result in a new UV curve. Other possibilities exist. For example, no new UV curve may be generated or a UV curve with the same "natural" rate of unemployment but a different slope may be created. The point to be noted, however, is that if increased unemployment is going to result from changes (a) (b) or (c) a new UV must be formed with a higher natural rate.

CHAPTER 5

A SURVEY OF THE LITERATURE PERTINENT TO TESTS OF SEARCH

1. INTRODUCTION

In Chapter 4 we presented seven possible tests of search theory. Three of these related to tests of the concept itself and four to the relationship between the phenomenon of search in the labour market and the level (and changes in the level) of unemployment. The empirical literature in economics includes research along the lines we have suggested. In some cases this research has been undertaken specifically as a test of search. In others, although the motivation has been different, the implication for search related hypotheses is apparent. The purpose of this chapter is to review the existing empirical literature pertaining to search in order to gauge the extent to which theory has been matched by fact.

In the next section we consider the question of the responsivness of the reservation wage to the length of unemployment and the related issues of risk, occupational flexibility and search intensity. Section 3 draws attention to the expanding literature on the relationship between both the level and duration of unemployment and the payment of unemployment benefits. Attempts to measure and analyse the discouraged worker phenomenon are the subject of Section 4. Section 5 briefly reviews attempts by economists to estimate the contribution to total unemployment of various unemployment types. Related to this are the various empirical endeavours to establish a relationship between unemployment and vacancies. Such enquiries are the subject of Section 6. Section 7 reviews the findings of research into the length of unemployment spells and the implications these findings have for search theory as an explanation of unemployment. Section 8 concludes.

2. THE ASKING WAGE AND RELATED ASPECTS

2.1 The Asking Wage and the Duration of Unemployment

In Chapter 3 we noted the the Mortensen (1970b) model predicts that the minimum asking wage is constant over the duration of unemployment. Gronau (1971) on the other hand developed a search model which suggested that an unemployed job hunter would reduce his minimum asking wage over the duration of unemployment because of the reduction in the length of time available for subsequent employment. This may result (a) from a reduction in the length of time the worker expects to be on the next job or (b) a reduction in his overall working life which reduces the time available for employment in total. In contrast McCall (1970) proposes a reduction in the asking wage because the job seekers' perceived level of the distribution of wage offers might be revised downward because of information acquired during search and unemployment. The decline in the perceived wage offer distribution would reduce the expected income from search, lower the minimum asking wage, and cause increasing downward wage flexibility over the duration of unemployment. These differences, with respect to the responsiveness of the asking wage, were first noted by Barnes (1975). He saw in them a means of establishing empirically, which of the three search models most clearly reflected reality.

In testing the three models Barnes made use of data collected in a 1962 sample of older workers.[1] The variables employed were (1) Duration of unemployment (D_u); the duration of current unemployment in months. (2) Asking wage (W_a); the lowest acceptable wage level for the current duration of unemployment. (3) Previous wage (W_p); the proxy for this was the wage rate for the longest job of the past five years. (4) Flexibility of wages (F_w); this was formed by applying the formula

$$F_w = W_a/W_p \cdot 100 \qquad (2.1)$$

(5) Age (A); (6) Length of Employment (L_e); length in years of longest job. (7) Intervening Jobs (I_j); Intervening since the longest job of the past five years. (8) Expectation of availability of acceptable job offers (E_j).

To test the prediction that W_a declined with the length of unemployment the following equation was estimated.

$$F_w = a + b\,D_u + c\,D_u^2 \tag{2.2}$$

The results indicated that the monthly wage decline is significantly different from zero, refuting Mortensen's hypothesis of a constant minimum asking wage and supporting the changing flexibility of the Gronau and McCall models. These results were in keeping with the results obtained by Kasper (1967). Kasper however cautioned that it is not clear that a willingness to reduce one's asking wage can increase the likelihood of employment. At best, the evidence he presented suggests that it might be possible (Kasper 1967 p.172). This may be in part an explanation for Barnes' observation that twelve months of unemployment does not produce a wage decline from the continuation of unemployment as great as the instantaneous wage decline at job separation (Barnes 1975 p.234). It also casts doubt on the importance of the asking wage in determining the length of unemployment.

To test the explanations of asking wage flexibility provided by Gronau and McCall, Barnes noted that if Gronau is correct in suggesting that a shorter remaining lifetime employment length reduces the minimum asking wage, then a longer previous job duration prior to the current job search and perhaps older age would result in a greater instantaneous decline in the minimum asking wage when the searcher becomes unemployed. On the other hand, if the second of Gronau's explanations is correct, individuals whose last job was not the longest would have a reduced expected length for future jobs compared to the longest job, if it is assumed that the length of the job preceding unemployment measures the expected length of the next job. Therefore, individuals for whom the last job was not the longest should show greater instantaneous wage flexibility (measured from the longest job) than searchers whose last job was the longest and who, therefore, are assumed not to have shortened the expected length of the next job. Finally, McCall's hypothesis would be supported of job seekers increased wage flexibility in response to declines in expected wages and if their perceptions of expected wages were revised downward over the duration of unemployment.

To investigate McCall's and Gronau's explanations of flexibility the following equation was estimated:

$$F_w = a + bA + cL_e + dI_j + eE_j. \qquad (2.3)$$

The parameters consistent with Gronau's model, b,c and d were not significantly different from zero. The coefficient on E_j was consistent with McCall's explanation and significant at the .01 level. Thus Barnes investigation produced evidence to support the theory of wage setting behaviour proposed by McCall.

A major drawback to Barnes' investigation was that it relied on a single equation model which treated the duration of unemployment as an independent variable. While the search theory "model" certainly implies that the reservation wage, and also direct search costs and expected time on the next job, are each affected by the duration of unemployment, the latter, in turn, is affected by the reservation wage and direct search costs. Thus, since the job searcher must make several decisions which have interrelated effects, a simultaneous equation model of job search is needed to examine the implications of theoretical job search. This requirement was met by Crosslin and Stevens (1977) and Stephenson (1976). Crosslin and Stevens fitted a two equation model to data collected by the Missouri Division of Employment Security and found particularly strong evidence of a downward flexibility in asking wages over the duration of unemployment amongst those who received less than the maximum weekly unemployment benefit. For those receiving the maximum benefit, downward flexibility was found to be significantly impeded. Stephenson used a four-equation model to examine youth job-search behaviour and also found that the reservation wage falls over unemployment duration.

The variable for the "asking wage" used in empirical studies is usually obtained by asking respondents to a questionaire at what wage would they accept a job. The response to such a question poses two problems. First, even if the response reflects the individuals true intention; and this is certainly dubious, it may give only a poor indication of how the individual will actually respond in any given set of circumstances. i.e. the variable may become contaminated by the individual selection process making it difficult to distinguish variations in outcomes due to environment from variations due to search strategies. Second, the reservation wage may be set unduly high giving the individual no likelihood of finding a job. It would seem reasonable to classify such a person as not in the work force. In an attempt to overcome the first of these difficulties Kiefer and Neumann (1979) used observed re-employment wages as a proxy for the asking wage to test the hypothesis that the asking wage remained constant throughout the duration of unemployment. Although this hypothesis was soundly rejected, their technique did not permit them to identify which of several possible explanations cause reservation wages to decline.

The severity of the second problem in obfuscating the relationship between the length of a period of unemployment and the reduction in the asking wage is highlighted by Sandell (1980a). He employed data from a longitudinal survey of mature women who eventually obtained employment. That the data was limited to workers who eventually found employment meant that it excluded searchers whose reservation wages were set unduly high. In general his results concur with those found by other researchers but in terms of magnitude the estimates are far greater than previous studies had found.

2.2 Search and Risk

In a subsequent paper Sandell (1980b) showed that it would seem optimal for the typical woman in his sample to choose a higher asking wage, suffer a longer spell of unemployment but eventually obtain a higher paying job than she would have under her currently observed job-search strategy. One explanation he offers for the non-optimal activity of women is in terms of risk. If married women are extremely risk averse, their asking wages could be low in spite of the higher expected value of gains to search. It has been shown by Lippman and McCall (1976a) that risk-averse individuals conduct less job search and are willing to accept job offers that less risk averse individuals would refuse. Intuitively, we can see that the searcher must compare an offer that is known with the uncertain prospect resulting from an additional draw from the wage distribution so that, under risk aversion, the certain return of x dollars will be valued more than an expected return of x dollars; thus we might anticipate that the reservation wage would decline in the presence of risk aversion. The same conclusion is reached in the papers by Pissarides (1974) and Kohn and Shavell (1974). Feinberg (1977b) empirically tests the assumption that an individual who is more risk averse than another will have a shorter expected duration of unemployment but warns that although the regression specification used to test this implication was developed in the context of job-search theory, alternative theories could produce these results. Hence he did not regard the empirical work discussed in his paper as a test of job-search theory, although his results generally confirmed the existence of a negative relationship between risk aversion and unemployment duration.

2.3 Search, Occupational Flexibility and Job Vacancies

Most search models characterize the individual worker's role in market adjustment to unemployment as operating only through changes in the price of labour or through withdrawal of labour (the discouraged worker effect). Barnes (1974) argues that it is also possible for adjustments to occur through individual flexibility in the quality or type of labour sold, in willingness to be downwardly flexible in occupation, or to undergo retraining. The unemployed jobseeker's willingness to be flexible downward in occupation and/or to undergo retraining increases the number of acceptable offers and therefore increases prospects for commencement of employment and earnings. Since downward occupational flexibility implies a decline in the acceptable earnings level, explanations of wage flexibility developed in job search models provide implications for downward occupational flexibility. Search theory based on this concept may be more applicable to situations in which there is a relative inflexibility of wages due to entrenched insitutional constraints. i.e. variation of occupation may be the only viable means of increasing the probability of finding an acceptable job.

Occupational flexibility would be increased by the same factors responsible for increasing wage flexibility; a lower perceived distribution of wage offers, a shorter expected period of employment, a higher discount rate; and higher costs of search.

Investment in training will also influence occupational flexibility. Training specific to an occupation increases the worker's expected wage in the occupation of training only. Expected wage offers are higher in the occupation of training and lower outside the occupation of training. This reduces earnings from offers for jobs outside the occupation for training. Job training may increase expected returns in an occupation and discourage downward occupational flexibility.

Using linear discriminant analysis Barnes was able to show that increased length of unemployment raised occupational flexibility while training lowered it. It was also apparent that unemployed searchers demonstrated increased willingness to be downwardly flexible and to undergo retraining when unemployment rates in the local labour market were rising. This latter finding suggests that the general market information which the searcher possesses, independent of his experiences in individually sampling offers, has been underestimated in most search models.

The importance of occupational flexibility is emphasised when consideration is given to the modification made to the analysis by Barron (1975). Barron constructs a model which makes allowance for the time it takes searchers to search firms for vacancies as well as the time it takes to search the vacancies they have found for suitable wages. This approach allows explicit consideration of an "involuntary" aspect of search not present in much of the existing literature.

Determining the duration of unemployment are now two explicit probabilities. The first is the probability of finding a vacancy (P_v). The second is the probability of finding an acceptable offer (O_a) as per conventional job search theory. Combining both of these the duration of unemployment U_d will be given by

$$U_d = 1/P_v \cdot O_a \qquad (2.4)$$

A searcher will have a greater probability of finding a vacancy if he is occupationally flexible even if he is not flexible with respect to his wage rate. Thus, in an economy such as New Zealand's, in which the institutional structures encourages occupational flexibility but not wage variability, the adjustment in the labour market, in a search context, is likely to be explained by occupational mobility.

Barron however gives greater weight to his empirical findings. The probability that, in a given period, the representative unemployed individual in the economy finds and accepts employment is $P_v . O_a$ (abstracting from variations in the rate at which unemployed individuals leave the labour force). A decrease in the number of available vacancies decreases P_v and may either decrease or increase O_a. Barron argues that O_a will increase but that it will be dominated by the fall in P_v. This is supported by his empirical findings which show not surprisingly, that increased unemployment duration is associated with a decrease in vacancies. The search theoretic explanations of the short-run Phillips Curve argue that, when wages increase, unemployment will fall because of an increase in 0_a. Barron's research has shown that 0_a rises more as vacancies decline and thus his findings raise some serious doubts about the theoretic underpinning of the short-run Phillips Curve. Indeed, confirming Barron's work was a short note by Feinberg (1977a) which showed in rigorous terms that the conclusions Barron's finding suggested were legitimate.

2.4 Search Intensity and Search Costs

The question of whether or not workers remainded unemployed because they could not find job vacancies or because they were holding out for wages higher than offered in the vacancies they encountered was also addressed by Yoon (1981). On the face of it, his empirical work appears to add further support to the conclusions of the preceding section. The first of his major findings indicates that the greater part of unemployment duration, for a typical job searcher, is ascribed to the time it takes him to find an offer rather than his rejection of received offers. Yoon's explanation for this, however, focuses on the intensity of search undertaken by an individual. Most determinants of the time spent in obtaining an offer e.g. labour market conditions (availability of vacancies) and socio-economic characteristics of the searcher (attainment of skills), are beyond his control over the duration of unemployment. However, the time spent searching can be shortened as the searcher intensifies his search effort. Raising search intensity, however, is costly and it increases the search cost for an offer. Thus, the searcher should choose the optimal level of search intensity to maximize the net return from job search.

Search costs can be divided into two groups. Fixed costs and variable costs. Fixed costs are incurred regardless of the intensity of search and hence the higher they are the quicker the searcher will want to complete search in order to do away with them. (Unemployment benefits will reduce fixed costs of search and therefore encourage longer search and hence unemployment duration). The variable costs, the unit cost of search intensity, are incurred only as search is actually undertaken and will therefore vary with search intensity. A rise in the unit cost of search intensity will therefore reduce intensity and result in a longer search (and therefore longer unemployment). Lowering these costs, through improvement in the State employment service and provision of tax benefits for the private employment agencies, can therefore be expected to lower the overall rate of unemployment by speeding up the search process.

Thus increasing search cost of an offer does not necessarily imply shorter unemployment duration. If the elasticity of mean search time for an offer with respect to search intensity is greater than -1 and less than 0, the increase in search cost as a result of an increase in the unit cost of search intensity could, in fact, increase unemployment duration. This is because the first component of unemployment duration rises faster than the second falls. Yoon's empirical work indicated that these conditions held requiring modification to Gilley's (1980) findings that the evidence supports the hypothesis that increasing search costs reduce the duration of unemployment.

That time spent unemployed is not necessarily time in search is also recognized by Mellow (1978). He develops a model of the duration of unemployment (which nontheless he argues is a proxy for search) and relates it to the cost of search which are approximated by the worker's actual wage (on his previous job) and a measure of his estimated expected wage. He concludes that lowering search costs, by for example raising the level of the unemployment benefit, increases the length of unemployment. He is, however, unable to state categorically that the amount of search is also increased. Indeed, his results are consistent with the hypothesis that unemployment benefits reduce the incentive to search and therefore results in "excessive" spells of unemployment.

2.5 Summary

The analyses reviewed above is largely supportive of the existence of search as an activity in the labour market. In all cases, however, the data used in testing the various hypotheses was micro in nature. Consequently, although it could be used to test if individuals respond to a given set of circumstances in a manner predicted by search theory, it could not be used to test the prediction that changes in search activity are responsible for changes in the global unemployment rate.

3. UNEMPLOYMENT BENEFIT AND UNEMPLOYMENT

3.1 Introduction

The relationship between unemployment benefits and unemployment is an important consideration both from the point of view of search as a phenomenon and search as an explanation for rising unemployment levels. The empirical analysis of the relationship has taken place on two fronts. First, is the micro or cross-section approach. Such studies make use of information on individual unemployment and its relation to the individual's characteristics. Generally this method is restricted to seeking to explain the differential duration of unemployment for individual members of the sample, with one of the explanatary variables being the ratio of unemployment benefits to income. The second approach is aggregate in nature and concerns itself with time-series evidence. This approach, despite a number of drawbacks that will be mentioned presently, enables both aspects of the relationship between unemployment benefits and unemployment to be tested.

3.2 Unemployment Benefits and Unemployment Duration

Chapin (1971) was the first to utilize search theory as a basis for empirical work attempting to establish a relationship between unemployment benefits and the duration of unemployment. He, as did many of the early search theorists, assumed a direct relationship between unemployment and search and failed to distinguish between the fixed costs of search and the unit costs of search. His results, based

1. Estimates of the Impact of a 10 Percent Increase in the Ratio of Unemployment Benefits to Income on the Duration of Unemployment.

Study	Data	Effect on Weeks of Unemployment
Lininger (1963)[d]	Michigan, 1955	0.06
Chapin (1971)[d]	All States, USA 1962-67	0.46
Burgess and Kingston (1974)[d]	Boston, Bay Area Phoenix 1969-70	
	Males	0.01
	Females	-0.04
Schmidt (1974)[d]	USA 1966	1.60
Classen (1975)[d]	Pennsylvania 1967-68	1.10
Crosslin (1975)[d]	St Louis 1971-73	-0.09
	Cleveland	-0.05
Felder (1975)[d]	Denver 1970	
	Males	1.40
	Females	1.40
Hanna et al. (1975)[d]	Nevada 1969-72	1.00
Marston (1975)[d]	Detroit 1969	0.23 to 0.62
Wandner (1975)[d]	USA 1966-69	0.53
Ehrenberg and Oaxaca (1976)[d]	USA Males	
	Aged 45-59 (1966-67)	1.50
	Aged 14-24 (1966-69)	0.20
	USA Females	
	Aged 30-44 (1968-71)	0.30
	Aged 14-24 (1967-70)	0.50
Holen (1976)[d]	Boston, Bay Area Phoenix, 1969-70	0.60
Moffitt and Nicholson (1982)	USA 1976	0.40
Maki (1977)	Provinces, Canada 1962-1974	0.35[a]
Nickell (1979)	UK Males	1.17[b]
Lancaster (1979)	UK 1973	1.17[b]
Gregory and Paterson (1980)	Australia 1967(1)-1978(11)	
	Males	
	Aged 15-21	0.19[c]
	Aged 21-65	1.26[c]
	Females	
	Aged 15-21	0.42[c]
	Aged 21-65	1.34[c]

[a] Based on a mean duration of 12.0 weeks

[b] Based on a mean duration of 19.5 weeks

[c] Based on mean durations of 13.5, 18.8, 15.7 and 21.2 weeks respectively (as quoted in Paterson (1980 p.6))

[d] Reported in Hamermesh (1977)

<u>Source</u> Hamermesh (1977); Maki (1977); Lancaster (1979); Nickell (1979a); Gregory and Paterson (1980); Paterson (1980); UK Department of Employment (1980); and Moffitt and Nicholson (1982).

on a single equation model, indicated a statistically significant, although minor, relationship between unemployment duration and the level of unemployment benefits. Chapin found, for example, that increasing the level of benefits relative to wages by 10 percent might increase the duration of unemployment by 1.3 percent (which in 1967, the period relevant to the data Chapin used, would mean about three days). Marston (1975) also concluded that the empirical evidence supported the hypothesised relationship but that it did not appear to be a powerful cause for the unemployment problems of the seventies.

Table 1 summarizes the findings of Chapin and Marston, as well as those from other studies of the impact of unemployment benefits on the duration of unemployment conducted during the period 1963 to 1980 for the USA, Canada, the United Kingdom and Australia. In order to make the studies comparable, the summation is undertaken by considering what the effect on duration of a 10 percent increase in the ratio of weekly benefits to average weekly wage (or an approximation in the case of Classen, Felder and Holden[2]) would be. Such estimates assume, in the calculation, that nothing else changes. A quick perusal of the table shows that the estimates range from less than zero to 1.6, the latter figure indicating that a 10 percent increase in the benefit to income ratio would raise unemployment duration by 1.6 weeks.

All of these studies, with the exception of Maki (1977) and Gregory and Paterson (1980) are cross-section studies. Hammermesh (1977) warns that simply taking an average of the studies' results in order to obtain some estimate of the impact of benefits on duration in general is not warranted. Such a warning is appropriate for a number of reasons. First, given the methodology used in conducting the micro studies, one can never hope to explain all the variations in the data. Lancaster (1979) and Atkinson (1981) both argue that the duration of unemployment is a random variable and that therefore, even in a "perfect" model, only a certain fraction of the variance can be explained. What the studies should be seeking to explain, argues Atkinson, is the differential probability of different individuals remaining unemployed. However, this gives rise to a second problem. There are many factors likely to influence such probabilities; they include age, previous work career, education and qualifications, family circumstances, sex, race and local labour market conditions. These may affect the reservation wage of the individual or the probability of receiving a job offer. Consequently, any model designed to test the relationship between unemployment duration and the benefit-income ratio must incorporate these factors. Their omission is likely to lead to biased estimates. Unfortunately, the nature of the data sources used in the studies reported is such that the foregoing requirement is never fully met in any study. In addition, the degree to which it is not, varies, from study to study so that they are not strictly comparable. A third problem arises from the unknown bias contained in the samples used. Hamermesh (1977) reports that the data used by Burgess and Kingston (1976-77) and Crosslin (1977) was drawn from a group of benefit claiments who had been chosen for interview as part of a much broader special project. Consequently their results may have been biased because of this extra attention. Much the same criticism could be made of the data used by Lancaster (1979) which consisted of a sample of workers from the British labour exchanges who had agreed to be interviewed. While the data collection methods pose difficulties, a fourth problem of comparison is created by the different types of data collected. This problem has two aspects. The first concerns the definition of unemployment. It is well established that the definition of unemployment varies considerably, depending on who is collecting the information and for what purpose. Part of the variation observed in Table 1 may result from differences in the definition of unemployment. The second aspect is equally likely to cause discrepancies. Studies, such as those of Ehrenberg and Oaxaca (1976), Classen (1977), Holen (1977) and Gregory and Paterson (1980) use data on the completed spell of unemployment to directly analyze unemployment duration. Maki (1977), Lancaster (1979) and Nickell (1979a) on the other hand, employ information on interrupted spells of unemployment. Although Nickell attempts to overcome the problem by estimating directly the conditional probability of an individual leaving unemployment in any particular week and then using the estimated probabilities to derive information on expected durations, one is left uncertain as to whether or not the studies are analyzing the same relationship. This problem is compounded when one attempts to compare the aggregate time series studies of duration, undertaken by Maki (1977) and Gregory and Paterson (1980), with those of a micro, cross-sectional nature.

Despite these difficulties, the results reported in Table 1 suggest that the effect of benefits on unemployment duration is significant but small in magnitude. Such findings are consistent with the concept of search but, as we have already noted, they are also consistent with the substitution of unemployment - benefit subsidized leisure for work. In addition, the results are unable to substantiate the claim that higher levels of unemployment result from increased benefits - whether through search or leisure substitution. Even if the studies were able to allow for the possible effect on the flow into unemployment, the rise is the level of unemployment for one group of workers may simply mean that another group are employed - with aggregate unemployment remaining unchanged (see Atkinson 1981 p.143).

3.3 Unemployment Benefits and the Level of Unemployment

In the mid 1970s a group of economists from Canada's Simon Fraser University produced a series of papers purporting to show a significant link between unemployment benefit and the unemployment rate.[3] The methodology of the group is well illustrated by the work of Grubel et al. (1975). In their empirical analysis the writers employed a four equation model which was estimated using two stage least squares. The equation of greatest concern was that which attempted to explain the rate of unemployment. The equation was as follows.

2. Studies of the Impact of Unemployment Benefits on the Unemployment Rate

Study	Data	Mean of Average Benefit to Average Income	Elasticity of Unemployment rate to Unemployment Benefit - Income Rate at Means	Actual 1981 Unemployment Rate (percent)	Estimated 1981 Unemployment Rate Following a 10 percent rise in the Unemployment - Benefit -Income Ratio[a]
Maki and Spindler (1975)	UK 1948-1972				
	Male		0.68	11.3	12.0
	Total	0.497	0.62		
Grubel, Maki and Sax (1975)	Canada 1953-1972	0.290	0.69	7.5	8.0
Grubel and Maki (1978)[d]	USA 1951-1968	0.342	6.00	7.5	12.0
Braae[b] (1978)[d]	New Zealand 1954-1975	0.519 (0.285)[c]	0.04	3.6	3.6
Stahl[b] (1978)[d]	Sweden 1956-1975	0.322	0.03	2.5	2.5
Gerard, Glejser and Vuchelen (1978)[d]	Belgium 1954-1974	0.550	3.00	10.9	14.2
Claassen and Lane (1978)[d]	France 1967-1975	0.633	0.57	7.6	8.0
König and Franz (1978)[d]	Germany 1960-1975	0.453	0.05	4.3	4.3

[a] Assuming that the unemployment benefit - income ratio was at its mean level

[b] The significance of the relationship between unemployment rate and the benefit income ratio was not established.

[c] Single payment. Braae had used the married rate to obtain his results.

[d] Reported in Grubel and Walker (1978).

Source Grubel, Maki and Sax (1975); Maki and Spindler (1975); Grubel and Walker (1978).

$$LnU = a + b\ B/Y + c\Delta GNP + d\Delta GNP_{t-1} + ePR_F + fPR_m + g\ INEL \qquad (3.1)$$

where

U = unemployment rate

B = weekly unemployment benefit

Y = average weekly wage

ΔGNP = change in GNP

PR_F = female participation rate

PR_m = male participation rate

INEL = number of benefit applications declined as a percent of total applicants

A summary of the results obtained are reported in Table 2. This table also reports the results obtained in other studies using the same, or similar, methodology. For purposes of comparison the results have been adjusted to conform to the assumption that the ratio, B/Y, in 1981 is at the mean level for this variable over the study period. The second last column reports the unemployment rate for 1981 and the last column reports the estimate of the unemployment rate on the assumption of a 10 percent increase in B/Y. This estimate is based on the elasticity of the unemployment rate with respect to changes in B/Y. The elasticity is also reported in the table. In some cases, notably the UK, the USA and Belgium, the effect is substantial. In others, Canada and France for example, the effect is moderate. However, in Germany, New Zealand and Sweden, there appears to be little effect at all.

Atkinson (1981) reports three criticisms of the general approach of the foregoing studies. First, there is the problem of specification. Diewert (1978) has noted the need for a "...theory of the effect of unemployment insurance which is built up on micro foundations, since the rigorous use of consumer theory in constructing the model to be estimated imposes discipline on the choice of variables to be included as controls." Atkinson argues that this sets a demanding standard and points out the "essentially arbitrary choice" of variables in equation 3.1. The second problem concerns the interpretation of the equation as a reduced form. Helliwell (1978) has noted that "... from the point of view of a labour-market economist, or anyone concerned with microeconomic specifications, the use of a reduced-form unemployment equation is intrinsically unsatisfactory. One simply does not know how to work back to the micro-behavioural parameters." Atkinson (1981) charges that the unemployment relation should be seen in terms of a larger model of the labour market, which considers explicitly employment, hours of work and the supply of labour. The third problem concerns the appropriateness of the benefit/earnings ratio. There are great difficulties of representing the impact of benefits in a single indicator, and of separating it from other variables that exhibit a similar trend over time. For example the coefficient of B/Y may be reduced by the introduction of a variable for permanent income (Cubbin and Foley 1977) or it may be unstable over time (Sawyer 1979).

The simple macro-model of the labour market developed in Chapter 4 goes some way toward answering the first two of these criticisms. It is a model that accounts for both demand, supply and structural conditions in the economy and therefore forms a basis from which a reduced form equation such as 3.1 might be derived. To this extent the choice of variables in the regression is not arbitrary although, as for all empirical work, it does involve some judgement in choosing proxies intended to capture the effects considered to be important.[4] The third problem is specifically concerned with the choice of perhaps the most important of the proxies, the B/Y variable. Macro analysis is usually undertaken with reference to an "average" consumer or household and it is on this basis that B/Y is employed. However, strictly speaking, such an assumption is only justified when the relevant variables change smoothly and where the aggregation is over a representative cross-section of the population. In any area of aggregate research these conditions are not strictly met. This is clearly the case with B/Y. However, the importance of this criticism is over-emphasised. Certainly the average B/Y will not be representative of B/Y for all individuals or groups of individuals, but what is important in studies of this type, is whether or not the movement in the average B/Y is representative of the movement in the B/Y for all individuals or groups of individuals. In none of the studies reported is there any strong reason to believe that this second condition is anything other than closely approximated. Thus, it should be possible to use this information in an attempt to ascertain whether or not changes in the benefit - income ratio have had an affect on the unemployment rate. The results may not be precise - indeed given problems of trend in the B/Y variable they cannot be - but the alternative, cross-section or micro data, while perhaps giving more precise estimates of the impact of benefits on unemployment duration, will be largely unable to answer the question of whether or not the aggregate unemployment rate is affected by benefit payments.

We conclude, therefore, that the results reported do seem to indicate a positive, and at times quite strong, relationship between unemployment benefits and the level of unemployment. However, whether this is due to increased search or increased leisure can not be readily discerned.

3.4 Search or Leisure

We have seen in the previous chapter that two distinct theories are able to predict a similar relationship between unemployment and unemployment benefits. Search theory predicts that unemployment will rise with increases in unemployment benefit because of the effect of subsidizing search which leads to an increase in the acceptance wage. The income leisure model, on the other hand, predicts a similar result because the rise in the unemployment benefit makes leisure less expensive. Researchers have been conscious of this conflict. Holen and Horowitz (1974) for example, admitted that although some additional job search induced by unemployment benefits may be productive, at least some of the induced unemployment is not associated with job search. Feldstein (1975b) argued that little of the increased duration of unemployment is due to search and that a great deal is consumed in leisure activities. In addition, he argued that small changes in the duration of unemployment could have a very important impact on the overall rate of unemployment. Both writers were, however, making these statements on the basis of their own impressions rather than fact. The empirical work was inconclusive. As we have seen, the impact of benefits on unemployment duration was small - some would say trivial (see Fields 1977 p.7). The impact on the unemployment rate, on the other hand, was often substantial. Unemployment rates are determined by both the number of spells and the duration of spells. One explanation for the differing empirical results might be that the number of unemployment spells occuring at any one time had increased because higher unemployment benefits were inducing workers to take more frequent periods of unemployment rather than substantially longer periods. To the extent that this interpretation is correct, the discrepancy in the results would lend support to those theories predicting that workers take leisure rather than invest in search as a result of increased unemployment benefits. This is so because search should result in individuals obtaining jobs that are more suitable to them, which they are happier with and therefore which they are prepared to work at longer. However, Fields (1977) notes that there is no evidence that unemployment insurance causes the frequency of unemployment to be greater and the same discrepancy in results could arise from a greater number of individuals experiencing short, one-off spells.

In addressing the issue of the use to which the extra time unemployed was spent, Ehrenberg and Oaxaca (1975) and (1976) noted that search models imply that increases in unemployment benefits will raise an individual's expected post-unemployment wage. That is, unemployment benefits enable unemployed workers to hold out for jobs that are more commensurate with their skills. They therefore directed their study toward estimates of the effects of unemployment benefit on the expected duration of unemployment and on the post-unemployment wage. In their papers these effects are estimated separately for various demographic groups. Their findings were that unemployment benefits lead to significant longer duration of unemployment for all groups in the study. Unemployment benefits also lead to larger wage increases for all groups, but these effects are statistically significant only among females aged 30-44 and older males. It should also be noted that, again, although significant, the effect on duration was small. Thus they concluded that the predictions of the job search model were satisfied for the older groups of workers, but not for the 14-24 year old cohort. The youth findings may result from four possible causes. (a) Benefits are used by younger workers to subsidize nonmarket activities rather than job search. (b) Younger workers are not very productive searchers. (c) Young workers in receipt of benefits choose to search for more pleasant jobs which also pay lower wages because of compensating differentials and (d) Younger workers may search for jobs offering better opportunities for on-the-job training.

Burgess and Kingston (1976-77), who in an earlier paper[5] had demonstrated little relationship between unemployment duration and unemployment benefits, also turned their attention to the affect of unemployment benefits on re-employment earnings. Workers who search for work during a spell of unemployment following job separation are likely to fall into one of three categories; (1) persons who had no advance notice of job separation and were thus unable to conduct a pre-unemployment search; (2) those who had notice of job separation, but did not successfully conclude the job search process prior to unemployment; and (3) those who had advance notice of job separation, but chose to specialize in search activities after becoming unemployed.

Persons who find new employment prior to quitting their former jobs would be more likely to secure wage increases, more pleasant work or better working conditions, simply because the job changes were voluntary. In contrast, workers who experience a forced spell of unemployment (or who quit for cause with no pre-unemployment search) would likely have less favourable re-employment experiences. Thus the returns to job search for the unemployed workers analysed in Burgess and Kingston's study may take the form of lessening the decrease rather than actually producing an increase in earnings or other attributes of new employment options.

Since data was not available to analyse the nonmonetary aspects of the jobs found by the unemployed, the study focused on the monetary returns realized. Monetary returns to job search are realized primarily through the re-employment earnings which depend on <u>both</u> the wage rate (price) and the duration (quantity) of work associated with the re-employment option obtained. Thus instead of using re-employment wages they used an earnings measure for a one year period following the spell of unemployment.

The results revealed that higher weekly unemployment benefit payments and longer potential periods of compensation were associated with higher re-employment earnings. This indicates that any unemployment - prolonging effects of unemployment benefit support, if they exist, should be assessed in light of potential productivity gains attributable to unemployment benefit supported search in assessing the benefits and costs of such support to the individual worker and to society.

On the face of it these findings seem to support the search theoretic explanations. However the workers included in this particular analysis experienced a large earnings loss - more than 30 per cent - from the pre-unemployment to the post-unemployment year. Thus, the returns to job search for the average member of this group can be interpreted as minimizing the earnings loss attributable to the spell of unemployment. This evidence raises some questions about the assumption that unemployment can be viewed as a rational and voluntary decision to maximise earnings through full-time specialization in search.

Using the same data as Burgess and Kingston, Holen (1977) showed that higher benefit levels and longer potential duration lengthen the duration of unemployment and improve the search outcome. Classen (1977) however, while producing findings which support the hypothesis that an increase in benefits leads to an increase in duration of unemployment, found no support for the hypothesis that an increase in benefits leads to the generation and acceptance of more lucrative job offers.

In his review of the literature Welch (1977) stated that the research had provided important information on the duration effects of unemployment benefits but that only very tenative evidence of post-wage effects had been found. One of the major drawbacks to all of these studies was that most were based, at least partly, on the low unemployment years 1965-69. There was therefore no acceptable estimates of the effects of unemployment benefit at different points in the business cycle.[6] Welch went on to argue that the diversity precluded specific conclusions about how the extra time spent unemployed is used. Greater unemployment benefits appear to induce a longer duration of unemployment - roughly of the order of 0.5 weeks for each 10-percentage-point increase in benefits when the labour market was tight. Whether this extra time was used as leisure or as productive search leading to greater earnings could not be inferred from the existing studies. Welch concluded that given the current state of research into the topic, we simply do not know whether unemployment insurance is succeeding as a policy designed to allow the unemployed a chance to find better jobs than they would otherwise obtain. Indeed he felt that if anything, the evidence suggested that benefits were only serving to raise the amount of unemployment which was consumed as leisure.[7] To this point then, it appears that empirical investigation of the relationship between unemployment and unemployment benefits was not supportive of the search-theoretic approach to unemployment.[8]

In an effort to rehabilitate search theory Mortensen (1977), Burdett (1979) and Hamermesh (1979) reconsider the empirical work surveyed above and argue that the search model, when properly specified, produces an ambiguous prediction of the direction of the relationship between unemployment benefit payments and the duration of unemployment. Thus the small, although significant, relationships that have been found are, they would claim, to be expected from a correct interpretation of search theory. In essence their analysis rests on two institutional features of the American system; benefits are paid only for a specified duration rather than in every period of an unemployment spell, and workers who quit do not qualify for benefits. How long a worker has been unemployed will largely determine his reaction to a change in unemployment benefit payments. A recently unemployed worker will become more selective in evaluating job offers (as previously predicted) whereas long term unemployed (those nearing the end of their benefit payment period and who therefore need to obtain work in order to buid up entitlements) will react by becoming less selective. It is therefore predicted that unemployment benefit payments will have an adverse incentive effect on the short-term unemployed and a positive incentive on the long term unemployed.

Although the authors do not do so, their argument could be extended to explain the lack of relationship between unemployment benefits and higher post unemployment wages and incomes. Workers may initially raise their acceptance wage in response to the receipt of higher benefit payments. However, once they have exhausted their entitlement they are faced with a period of uncompensated unemployment. They respond by reducing their acceptance wage which enables them to find a job. Given this scenario, the empirical work considered may still be in accord with search theory. Supporting this argument is the work of Fische (1982) who provides evidence of productive search inducement of rising benefits after the expiration of benefits. He showed that reservation wages decrease, on average, by 15 percent when benefits are exhausted.

An alternative explanation for the lack of a strong relationship between benefits and re-employment wage levels is alluded to by Topel and Welch (1980). They argue that the analysis must take into account the fact that there is a possibility of obtaining future unemployment benefits and that therefore an increase in benefits will allow firms to offer the same value of an employment contract with a lower wage.

Finally Vickery (1979) argues strongly against both hypotheses in a paper which shows that under the current unemployment benefit schemes in the United States both one-earner and two-earner families suffer a real financial squeeze when the primary earner is unemployed. She concludes

> The once favourable public attitude toward unemployment benefits seems to be eroding as the task of reducing the unemployment rate without increasing inflation becomes more difficult. The current tendency to analyze the unemployment benefit program within an implicit full employment model not only results in a distorted picture of the programs effectiveness, but also has the effect of making the unemployed worker responsible for his or her joblessness. Such an optimistic abstraction of unemployment can lead to economic policies that ignore the personal costs of unemployment and, consequently fail to provide adequate support for the unemployed.

In concluding this section, we must reaffirm the view expressed in Chapter 4 that it will be difficult to find support for search theory based on the relationship between unemployment and unemployment benefits. Certainly the overseas evidence suggests that there is a strong relationship between benefits and the unemployment rate and a statistically significant although smaller realtionship between benefits and unemployment duration. However there is little agreement on whether these findings constitute support for the search hypothesis or the leisure hypothesis. One point that can be made, however, is that there appears little that is necessarily inconsistent with either search as a concept or search as an explanation for higher levels of unemployment.

4. HIDDEN AND DISCOURAGED WORKERS

4.1 Introduction

In the previous chapter we were able to differentiate, theoretically, between the concept of hidden unemployment and the concept of discouraged workers. The distinction is important, especially in those countries for which reported unemployment figures are based on employment office registrations. If the collection of unemployment data is based on a more reliable technique the distinction becomes less important although, even in these cases, definitional problems may exclude from the count, unemployed workers who are not yet discouraged. We will therefore define the hidden unemployed as all those who are unemployed but not included in the count plus those who have withdrawn from the labour force because they felt that there were insufficient opportunities available to them. This latter group is, of course, the number of discouraged workers.

Three basic techniques have been developed in an attempt to discern the number of discouraged workers existing in an economy at any point in time. Only one of these, the survey method, is able to do this adequately. Perhaps the best example of this method is that conducted by the Bureau of Labour Statistics in the USA and discussed in detail by McElhattan (1980). In essence, non participants in the work force are asked a series of questions, the answers to which enable the BLS to identify those individuals who are discouraged. The second technique involves attempts to correlate (ceteris paribus) labour force participation rates with the rate of unemployment (employment). A negative (positive) relationship between these two variables would indicate the dominance of the discouraged worker effect. The coefficients obtained could also be used to derive a hypothetical unemployment figure, given a particular employment assumption, which, once actual unemployment had been subtracted, would enable the construction of a discouraged worker series. Three of the earliest studies to take this approach were those of Tella (1963-64) and Strand and Dernburg (1964) with time-series data; and Bowen and Finegan (1969) with cross-section data. The final approach is based on the utilization of the trend of labour force participation rates. The trend is used to produce a potential labour force series. The difference between the potential and actual series is then defined as the number of discouraged workers. Taylor (1970) has made use of this technique.

4.2 Findings from the Econometric Approach

Tella's (1963-64) analyses indicated that variations in employment had a considerable impact on the size of the labour force and that a large number of discouraged workers were likely to exist, especially among females. These findings were supported by those of Dernburg and Strand (1964) who, using time-series data, were able to show that an initial decline in employment from a cyclical peak resulted in large-scale discouragement and withdrawal from the labour force. Subsequent declines were shown to be met by a smaller decline in labour-force participation while, as the period of economic slack grew longer, pressure on additional workers to enter the labour force built up to partially offset the discouragement effect.

Both Tella and Strand and Dernberg followed up their initial work with a study of the relationship between participation and labour-market tightness by age and sex (Tella 1965 and Dernburg and Strand 1966). In these studies each of the female groups appeared to be subject to the discouraged worker effect, while among men, only the very young and the very old seemed to be affected.

A number of writers attempted to corroborate the findings of Tella and Dernburg and Strand however in doing so, they alerted researchers to a variety of problems that had not previously been given sufficient attention. In their research, Tella and Dernburg and Strand had utilized the ratio of employment to total population (E/P) as the major explanatory variable. Barth (1967-68) reports a comment by Mincer (1965) that since E/P must necessarily be a large (and positive) proportion of the ratio of the labour force to total population (L/P), it would be virtually impossible to detect the additional worker effect as indicated by a negative coefficient. In addition Bowen and Finegan (1969) argued that the use of E/P would give an exaggerated impression of the degree of sensitivity because, (a) E/P is likely to be more responsive to supply-side influences than the ratio of unemployment to labour force (U/L); (b) In the USA E/P has been more sensitive to purely demographic influences than have any of the alternative predictors of group participation rates; (c) Movements in E/P pick up major exogenous changes in the participation patterns of large population groups; and (d) employment represents a large fraction of people in the work force and hence autonomous movements in the ratio of labour force to population (L/P)- those not caused by changes in labour demand - are almost certain to be accompanied by similar movements in E/P generating a spurious positive association between these two variables.

Both Barth and Bowen and Finegan attempted to avoid the problems associated with the use of E/P by using the ratio of unemployment to the labour force (U/L) as their major independent variable. Tella (1963-64) had argued that to regress L/P on U/L or E/L "... would tend to obfuscate the relationship between the dependent and independent variables" since L would appear in both the numerator of the dependent variable and the denominator of the independent variable, "and thus would be negatively related to itself in the equation". Bowen and Finegan argue that this criticism rests on the assumption that the extraneous factors involved either do not effect the values of U at all, or that there are inversely correlated errors in L and U. Both of these possibilities they considered to be remote.

In the event, although the findings of Bowen and Finegan (1969) differ appreciably in magnitude from estimates obtained by Tella and Dernburg and Strand the direction of the estimates were similar. Barth's (1965) findings, however, failed to provide additional support for the belief that discouraged workers were concentrated amongst women. For the ten female age categories he employed, Barth found that the unemployment rate was significantly correlated with labour-force participation in only two cases and that even in these two cases the coefficients were small. Barth's findings did however provide some support for a small discouraged worker effect amongst males.

In addition to their time-series work, Bowen and Finegan also conducted additional experiments with cross-section data. They used this data to determine parameters of an equation relating labour-force rates of different population groups (by age and sex) to variables such as family income and wage rate. Their findings, utilizing the cross-section data, suggested a strong net negative sensitivity of the labour force to unemployment. Two New Zealand studies (see Neild (1971) and Hyman (1979)) have employed a methodology similar to that of Bowen and Finegan. In neither case was a strong relationship between labour-force participation and unemployment found. We will consider the work of these two authors in greater detail in the next chapter.

Gallaway (1969) also made use of cross-section data and produced results that supported the contentions of Tella and Dernburg and Strand. In particular Gallaway found significant evidence of discouraged women workers and a strong inverse relationship between discouragement and the individual's potential earnings.

A further problem in testing for the discouraged and additional worker effects was uncovered by the research of Vroman (1970) and Butler and Demopoulos (1971). They demonstrated that the coefficients of the models relating participation to the demand for labour varied as the time period chosen for the research varied. That is, they found an instability in the regression equations in the sense that an equation estimated over one period had quite different coefficients and significance levels if estimated over a slightly different period. In addition Butler and Demopoulos observed that their estimated of discouraged workers differed greatly from official estimates based on survey data that were just starting to become available. Nevertheless both papers provided additional support for the existence of a discouraged worker affect especially among members of the secondary work force.

In view of the problem of coefficients changing with variations in the period over which estimates are made Gregory and Sheehan (1973), who employed data for the Australian economy, regarded it as a necessary condition that the relevant regression coefficient be significantly different from zero and similar in magnitude in each of the three time periods considered by them for an additional or discouraged worker effect to be established. On the basis of their examination they concluded that a discouraged worker effect exists and is larger for females than males.

In general, we can conclude that attempts to estimate the relationship between labour force participation and existing employment conditions have generated substantial evidence of discouraged workers, particularly among members of the secondary work force, and given support to the concept of the discouraged worker as a response to unsuccessful search.

According to search theory, adverse changes in employment conditions, which generate the discouraged worker effect, are not the only cause of labour force withdrawal. A fall in real wages may also cause workers to withdraw their labour. Fair (1971) and Wachter (1972) recognized this possibility and tested its applicability. As expected, their research revealed a fall in participation to be associated with a decline in real wages. Indeed Wachter found this effect to be so important that he concluded that the unemployment rate will only have an effect on participation during periods of chronic high unemployment. In his attempt to assess actual unemployment in New Zealand Walsh (1978) developed a model in which both the employment situation and the real wage rate were used. Unfortunately, although Walsh's methodology enabled him to show that considerable hidden unemployment existed in New Zealand - especially amongst women - it was not able to differentiate between hidden unemployment caused by measurement problems and that resulting from the discouraged worker effect. We will consider Walsh's model in greater detail in the next chapter.

4.3 Estimates from Trends in Activity Rates

An earlier attempt to ascertain the amount of hidden unemployment in New Zealand was that conducted by Gallacher (1974). Braae and Gallacher (1983) contains an updated version employing the same methodology. In each paper an attempt was made to construct a quarterly measure of unemployment by using the five-yearly census data to construct a quarterly series of potential labour force and subtracting actual (estimated) employment. The methodology will be discussed in detail in the next chapter. The findings of this research indicated that registered unemployment data severly understates the level of unemployment for both males and females. Unfortunately, as with Walsh's work, the procedure used to obtain the estimates does not permit a distinction between hidden unemployment resulting from measurement errors and hidden unemployment resulting from the discouraged worker effect.

A method which avoids some of the difficulties of the Gallacher approach, was pioneered by Taylor (1970). Taylor estimates hidden unemployment by subtracting actual labour force estimated from the value given by a trend through labour force peaks. Taylor's procedure implies that there is no measurement error in the labour force data so that all of the hidden unemployment is attributed to the discouraged worker phenomemon. Taylor's methodology also takes as given the fact that the number of discouraged workers will be inversely related to the level of economic activity. His findings therefore, that there exists a substantial discouraged worker effect, cannot be used as a test of the search related hypothesis that the number of discouraged workers rises with unemployment.

Taylor's procedure for estimating the number of hidden unemployed was also adopted by Merrilees (1977) for women and Stricker and Sheehan (1981), at the disaggregated level, using Australian data. Both works reported substantial evidence of discouraged workers although according to Stricker and Sheehan, this varied across the demographic groups chosen. Again however, no test of the search hypothesis is possible.

4.4 Surveys of Discouraged Workers

The best method for ascertaining both the number of discouraged workers and their characteristics is the survey approach. From 1964 to 1966 the U.S. Bureau of Labour Statistics began to experiment with a special set of survey questions designed to elicit detailed information on the reasons persons outside the labour force did not participate in the job market. In 1967, these questions were incorporated into the regular Current Population Survey (CPS). Since 1975 the Australian Bureau of Statistics (ABS) has also undertaken surveys of persons not in the labour force. Both surveys provide valuable information on the attitudes and intentions of persons who are not in the labour force and facilitate the accurate estimation of discouraged workers. In the following we consider some of the usages to which the BLS data source has been put.

Stein (1967) reported the findings from the first BLS survey. He notes that 14.2 per cent of people not in the work force were able to be classified as discouraged workers. The number of discouraged women was almost double that for males and the discouraged were predominantly poorly educated and nonwhite. The 1968 data, reported by Flaim (1969), confirmed these findings. In a follow-up study

Flaim (1973) showed that when joblessness rose in 1970-71 the number of workers reporting discouragement also rose but not proportionately. Using the same data Mincer (1973) disputed that the findings were evidence in support of the hypothesis that labour force withdrawals occur during the downswing. He argued that the findings were more likely to result from workers being discouraged from entering the work force than dropouts. However, in opposition to this, Gastwirth found that the survey estimates of discouraged workers correlated better with movements in unemployment than had econometric estimates.

McElhattan (1980) and Finegan (1981) each had the advantage of several years on discouraged workers when they conducted their research. Using data over the period 1967 (II) to 1977 (I) Finegan found that while the incidence of discouraged workers varies widely across demographic groups (with women of prime working age, older persons, and blacks all overrepresented), a statistically significant cyclical pattern appears for all of them. McElhattan's research covered the period 1967 (I) to 1978(II) and was couched explicitly in terms of a job-search model. Availability of work was found to be the sole factor influencing male discouragement while for women real wages and the level of unemployment benefits were also important.

4.5 Conclusion

The search theory model predicts that as unemployment rises some workers will become discouraged about their labour market prospects and withdraw from the work force. Further, those who withdraw are likely to be those with an alternative, non-market, source of income or whose prospective wages in employment are low. Consequently we can expect women, the elderly, the uneducated and ethnic minorities to be overrepresented in a count of discouraged workers. The literature we have just surveyed generally supports these predictions.

5. UNEMPLOYMENT TYPES

According to Thirlwall (1983), Friedman's intention was that the natural rate of unemployment, in general equilibrium, would be comprised of frictional and structural unemployment.[9] The search theory model argues that a sustained rise in the level of unemployment must result from a rise in the natural rate. Thus, a test of the contribution of search unemployment to rises in unemployment can be made if we have information on the movement of the structural and frictional components of unemployment. A rise in the level of frictional and structural unemployment, at a given level of unemployment, would be supportive of the predictions of search theory as an explanation for rises in unemployment.

Two procedures have been used to divide unemployment into its various component parts. The first, associated primarily with the work of Lipsey (1965) and Berman (1965) is an ex poste measure based on the reduction in unemployment following the application of a particular cure. The second, originally proposed by Perlman (1969), is ex ante in nature and obtained through an analysis of vacancy and unemployment data. The first approach to classifying unemployment types has become known as the "cure" approach and the second, as the causal approach.[10]

Lipsey and Berman were primarily interested in identifying the amount of structural unemployment that existed in the economy. In their models, unemployment was structural if it could not be reduced by expansionary monetary and fiscal policies, without a rise in the price level above some acceptable rate of inflation. This implies that an increase in structural unemployment, as defined by Lipsey and Berman, will result in an upward shifting of the relation between unemployment and the rate of price change. That is, other things being equal, a particular unemployment rate will now be compatible only with a higher rate of inflation than in the past.

Vanderkamp (1966) used this prediciton to test for changes in the level of structural unemployment in Canada. He concluded that if structural unemployment is defined in terms of the trade-off relation between unemployment and the rate of price change, there was no evidence to favour the hypothesis that structural unemployment had increased in the post-war period.

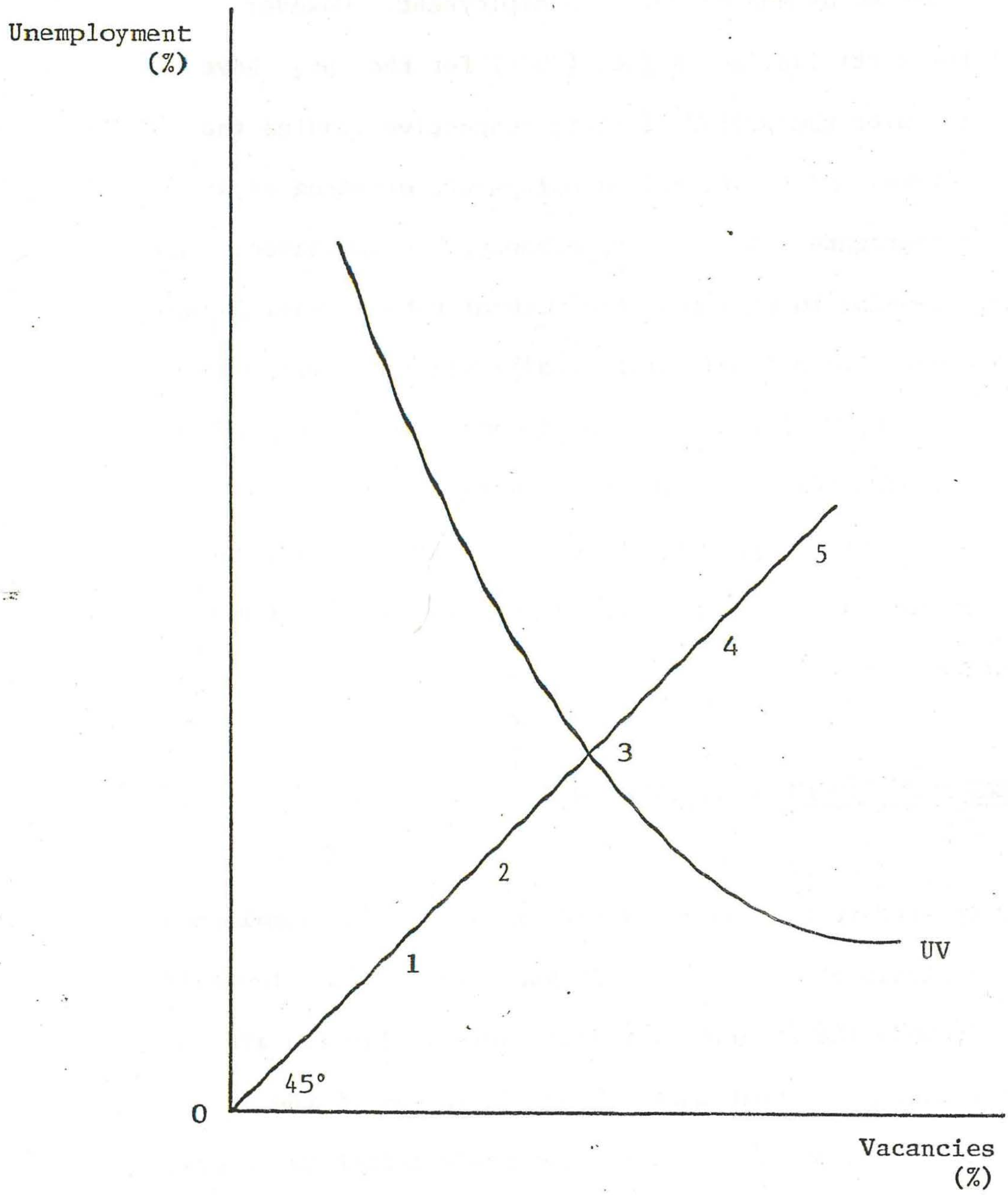
The alternate approach, of Perlman (1969), is perhaps more illuminating. A number of writers in Australia and the UK have employed his procedure of matching vacancies with unemployment to provide estimates of demand-deficient, frictional and structural unemployment over time.[11] In all these studies the scope for the validity of a search explanation of unemployment is obvious. Despite the fact that in each study demand-deficient unemployment was the single predominant component of unemployment for males, there were numerous occasions in which the combination of structural and frictional unemployment substantially exceeded the level of demand-deficient unemployment. Only in Australia (Hicks 1977) was demand-deficient unemployment clearly predominant for females. All of the remaining studies suggested that for many years frictional unemployment amongst women had been the chief cause of female unemployment. Even in Australia, frictional unemployment amongst women often accounted for nearly 50 per cent of female unemployment.

Because the Perlman classification system is sensitive to fluctuations in the level of demand, it is difficult to show, using this method, whether or not structural and frictional factors, of which changes in search behaviour is our primary concern, have contributed to rising unemployment. Certainly, for the studies cited, rises in total unemployment are generally associated with increases in measured demand-deficient unemployment. However Hicks (1977) for Australia, and Hughes (1974) for the UK, have demonstrated that over the period of their respective studies the amount of structural and frictional unemployment, existing at a given level of aggregate demand in the economy, has increased. They interpret this finding to mean that the natural rate of unemployment has increased over time and that historically high unemployment levels will not be as readily reduced by demand-management policies as may once have been the case. To the extent that such an interpretation is correct, it supports the hypothesis that changed search activity can, at least in part, be responsible for higher levels of unemployment.

6. THE UNEMPLOYMENT/VACANCY RELATIONSHIP

Closely related to the causal method of estimating unemployment types is the analysis of what has become known as the unemployment-vacancy relationship (henceforth UV relationship). The two are related by the assumption that unemployment in excess of the existing number of vacancies represents demand-deficient unemployment. All remaining unemployment is either frictional or structural. The basic difference between the two approaches to studying the labour market is that the causal method of estimating unemployment types

FIGURE A: The UV Curve



is concerned with matching the unemployed with vacancies at the micro level whereas the UV relationship is considered at the aggregate level.

Dow and Dicks-Mireaux (1958) were the first to introduce the concept of the UV curve which they argued would be convex to the origin (Figure A). Points along the curve were said to represent different levels of demand for labour. Point 3 was seen as a position in which the demand and supply of labour was equal. Points above the 45° line were points of low demand and points below the 45° line were points of high demand. Points along the 45° line (e.g. points 1 2 ...) correspond to different degrees of labour market maladjusted so that a UV curve passing through points 4, or 5 would be indicative of a labour market with a greater degree of mal-adjustment than a UV curve passing through point 1, 2 or 3.

Phelps (1968) and Hansen (1970) formulated in rigorous theoretical models what had been, for Dow and Dicks-Mireaux, a non-formal interpretation of an observed labour market phenomenon. Later writers have extended our theoretical understanding of the UV relationship. (See for example Bowden (1980) and Warren (1980)). In Chapter 3 we extended our search model to provide an explanation for both a static and dynamic UV curve, and it is in the light of this presentation that we wish to review the empirical literature pertaining to the UV curve.

Our model requires that if changes in the search behaviour of individuals is to be accepted as an explanation for increased unemployment then an outward shift of the UV curve must be observed. However, as we have seen, a change in the search behaviour of workers is only one of many possible explanations for such a shift.

The earliest empirical work on the UV curve, conducted in the US, was hampered by lack of adequate data. The US does not collect vacancy statistics so that researchers were forced to employ an index of help-wanted advertising as a proxy. Using the change in this index as the dependent variable Cohen and Solow (1967) found a statistically significant inverse relationship for the period 1951 (III) - 1964 (IV). Their research did not, however, indicate any shifts in the relationship over the period. Burch and Fabricant (1968), on the other hand, used the absolute level of the index as their dependent variable for the same period and found both a statistically significant relationship with unemployment over the period and a shift in the relationship in 1957 (I). Gujarati (1969) failed to find even a statistically significant relationship, however, Burch and Fabricant (1971), in their reply, argued that Gujarati had selected an erroneous dating for economic expansions and contractions in estimating his model and that this had largely contributed to his failure to find evidence of a relationship.

Gujarati (1972) turned his attention to the UK situation. Here, the data problems that were confounding research in the US did not exist. Gujarati estimated a regression equation relating unemployment and vacancies for the period 1958 (I) - 1966 (III). This equation was then employed to predict "expected" unemployment levels over subsequent time periods on the basis of vacancy levels existing during those periods. Gujarati's results indicated that the post 1966 (III) unemployment levels should be divided by a correcting factor of 1.44 in order to put them on a basis comparable with the data to which his equation was fitted. Gujarati believed that his results provided sound evidence for a statistically significant UV curve that had undergone an outward structural shift. By way of explanation Gujarati strongly suggested that the cause of this shift was the introduction of the Redundancy Payments Act of 1965 and the National Insurance Act of 1966. Both events, it could be argued, might be expected to produce an increase in voluntary unemployment of the type predicted by the search theory model.

Subsequent articles largely accepted Gujarati's empirical findings although there was some criticism of the precise specification of the model he had used to arrive at them. Most interest, however, focused on Gujarati's explanation of the outward shift observed in the measured UV curve. Taylor (1972) noted that in his explanation, Gujarati had concentrated on the supply side of the market and that he had neglected the demand side. Taylor believed that the most significant reason for the shift in the UV curve lay in a "shake-out" of hoarded labour. A "shake-out" represents something different from a simple reduction in the demand for labour. It consists in a reduction of internally held labour reserves. Although such a move, if undertaken by all employers, will augment the pool of unemployed, it will also mean that firms have eliminated reserves that could have been drawn upon to meet contingencies. Thus, when such contingencies arise they will have to be met by employers going to the labour market more often - generating more vacancies. Taylor's explanation subsequently found support in the work of Foster (1973 and 1974), Llewellyn and Newbold (1973) and Brown (1976). Llewellyn and Newbold noted that the "shake-out" hypothesis, in addition to a number of other explanations, was as plausible as that offered by Gujarati. Foster (1974) in a more formal manner, showed that both the "shake-out" hypothesis and an increase in young inexperienced labour contributed to the shift but that the introduction of the earnings related benefits associated with the National Insurance Act of 1966 was only of minor importance. Evans (1974), on the other hand, was able to use data over a longer period than previous writers to show that the change in shape of the UV curve after 1966 was such as to give support for Gujarati's hypothesis but not for Taylor's.

Bowers, Cheshire, Webb and Weeden (1972) had found what, at the time, they considered to be strong evidence for a demand side explanation of the shift in the UV curve but, in a later article, Bowers (1976), in commenting on the UV relationship, stated that

"... it is a derived relationship, dependent on the more fundamental flow variables I have considered; as such it can be discarded." Holden and Peel (1975) had also raised questions regarding the legitimacy of the UV relationship arguing that in no sense is the vacancy rate the determinant of the unemployment rate. Following these two papers authors became more careful about the specification of their models but work on the UV relationship continued both in the UK and elsewhere.[12]

Holmlund (1975) found evidence of an outward shift in Sweden's UV relation. Green and Cousineau (1976) noted that the UV model distinguished between, on the one hand, the impact of aggregate demand on unemployment and vacancies, and on the other, the impact of structural or other factors which alter the efficiency of (the frictions in) the labour market. Having established an outward movement of the Canadian UV curve they concluded that this was indirect evidence of an increase in search unemployment. Driehuis (1978) estimated UV curves and tested for outward shifts in them for Germany, Netherlands, UK, Belgium and France. His data covered the period 1955 - 1975 and in each case he found the outward shift substantial. Driehuis concluded that a rise in search unemployment is an important cause behind the present unemployment in these countries and that the expected employment effects of reductions in real wages and/or demand management were therefore largely illusions.

Warren (1977) presented and estimated a job search - labour turnover model of the British labour market from which he could derive the static equilibrium UV relationship rather than estimating it directly. Although he found no evidence supporting the UV relationship, Bewely (1979) adapted his model, again using data from Great Britain, and showed that a relationship not only existed but had shifted as a result of a change in the flow of quits and lay-offs from employment and a decline in the efficiency of searching for work. Bewley attributed the apparent contradiction between these results and those presented by Warren to Warren's inclusion of a time trend in his estimating equation. This would have captured much of the movement in the UV relationship. Hannah (1983a) examines shifts in the British UV curve over the later period of 1967-1979 and finds that unspecified structural changes are responsible for an outward movement of the relationship.

Warren (1980) went on to employ his model using US data. On this occassion he was able to identify a significant UV relationship but, because of the short time-series available to him, was not able to test for shifts. Hannah (1983b) used the help-wanted index rather than the Bureau of Labour Statistics data on manufacturing vacancies and was able to test for stability of the UV relation. He found no evidence of instability over the period of his study.

In Australia some limited research has been done on the nature and stability of the UV relationship existing there. Hughes (1975a) informally discusses the evidence for shifts and speculates on some possible causes. Harper's (1980) paper is more formal and prompted by "the dearth of thorough-going analyses of the UV phenomenon ... [in Australia]". Harper fits a dynamic specification of the UV function to Australian data. Having found this to fit satisfactorily he tests for structural stability of the relationship over the period and finds two shifts, one during 1962 and one during 1973. His preliminary investigation of possible causes of this instability points to increases in the real level of unemployment benefits and reductions in the assisted migrant intake over the period as significant contributing factors.

While Harper's findings can be interpreted as adding to the evidence for a search explanation of a rise in unemployment he did raise one possibility that many previous writers had ignored. That is, the possibility that the observed shift in the UV curve may result from a change in the meaning of the statistics on which such investigations are based, rather than any real shift in the structure of the labour market. Parikh (1977) had earlier commented that a major difficulty in estimating the UV relationship was the fact that both U and V are subject to observation error. This problem is further complicated by the fact that the errors in the measurement of U and V are likely to vary with the phases of economic activity. Evans (1977), comparing British data on registrations with census data, showed that the proportions of the unemployed who register as such may vary over time. He concluded that much of the observed shift in the British UV curve may be attributable to an increase in the proportion registering. Parikh (1982) argued that one could not be this certain. Using a sophisticated errors in variables approach, he showed that measurement errors and real factors both contributed to the change in the UV relationship. However he felt that until evidence on a micro-level was available, we would not be able to adequately determine whether the real factors concerned operated from the demand side or the supply side of the market.

The articles we have surveyed in this section generally lend support to the belief that as unemployment has deteriorated in recent years, it has been accompanied by an outward shift of the relationship between unemployment and vacancies. A large number of writers have argued that this phenomenon is consistent with a search explanation of unemployment and that it therefore provides indirect evidence for the search hypothesis. Other writers have proffered alternative explanations which, in the main, have not been taken up. However, in recent years, researchers have become increasingly aware of the fact that at least part of the shift may be due to errors in the measurement of unemployment and vacancies.

7. EVIDENCE ON UNEMPLOYMENT DURATION

Search theory essentially implies that unemployment is concentrated in isolated spells of short-term duration. An examination of the realities of unemployment spell lengths should therefore cast some light on the issue of whether or not the search activities of individuals contribute to unemployment and changes in the level of unemployment. Salant (1977) argued cogently that the duration variable we are interested in observing is the duration of completed spells, not the duration of spells in progress.[13] In this section, we therefore review attempts made to estimate the duration of completed spells.

In the UK, one of the first efforts at estimating the length of a completed spell was that made by Fowler (1968) He attempted to construct a stationary register of the unemployed by averaging eight biannual registers over the period 1961 - 1965.[14] The stationary register was a means of obtaining indirectly information about the characteristics of a cohort of persons coming on the register at the same time. It was necessary to use this method because detailed flow statistics relating to persons coming on and going off the register were not available. Once the stationary register was established the fitting of appropriate functions to describe the cumulative frequency distribution enabled the probability on entry of going off the register within x weeks to be calculated. Fowler's estimates showed that of those becoming unemployed 26 per cent would leave within a week and 68 per cent could expect to leave within four weeks. Cripps and Tarling (1974) also employed a steady state register in their work. However they argued that Fowler was wrong to assume that an average of a number of registers over a period of time was an adequate approximation to a steady state register. Cripps and Tarling first calculated the transition rates from one category of unemployment duration to the next for each quarter from 1932 to 1973. After seasonally adjusting this data they inspected the results for periods where the transition proportions appeared to have settled down and assumed that the observed transition porportions at such points could be used to construct stationary registers. They then were able to fit a frequency distribution to their data for each designated stationary period. Their results supported the findings of Fowler. Up to one half of those coming on to the register were found to leave within two weeks or less.

The major drawback to the stationary register approach is that it is unable to generate a time series of completed spell lengths. To avoid this problem Salant (1977) estimated the parameters of a simple escape-rate density based on observed lengths of interrupted spells at a given point in time.[15] He was able to show that the average completed spell of unemployment in 1969 was 4.4 weeks and that nearly 70 per cent of spells ended within 4.5 weeks. Trivedi and Baker (1982) used the same estimating procedure to produce a series for completed unemployment spell lengths in Australia over the period 1972 to 1981. They found that on average over the period the average length of a completed spell in unemployment was 12.2 weeks.

Various models, based on liklihood functions were developed and estimated by Frank (1978), Lancaster (1979), Nickell (1979b) and Lancaster and Nickell (1980). Models of this type estimated the conditional probability of an individual leaving unemployment in any particular week and then used the estimated probabilities to derive information on expected durations. The advantage of this approach over that of Salant was that it allowed the probability of leaving unemployment to vary over the period of unemployment. Frank (1978), in his study of US household heads, estimated that the average completed spell length was 8.7 weeks in mid-1974. Nickell (1979b) estimated that, for the UK in 1972, the "typical" unemployed man spent 10.5 weeks out of employment. Lancaster (1979) and Lancaster and Nickell (1980) do not report figures for duration as their calculation was merely part of a wider study that was attempting to explain variations in unemployment duration.

Although time-series data can be generated using the sophisticated econometric techniques of Salant, Frank, Lancaster and Nickell, its use will be somewhat limited because the models constructed assume a steady state labour market equilibrium in which flows into and out of employment and unemployment are, on average, equal. This was necessary because the data they were using did not provide information on either flows into or out of employment.

Bowers and Harkess (1979) derived a method for estimating the expected duration of unemployment on entry to the unemployment register. The statistic they used is given by the following equation:

$$UD = \sum_{x=o}^{xn} \frac{k(x,t)}{k(0,t-x)} \qquad (7.1)$$

where UD is the estimated average length of a completed spell of unemployment (in weeks)

$k(x,t)$ is the number of persons in their xth week in the register at t and

$k(0,t-x)$ is the number of new entrants into unemployment.

Unfortunately Bowers and Harkess did not have data on inflows and as a proxy they used the numbers who had been on the register for half of a week. In addition they assumed that the appropriate maximum value for n was 104 weeks. On average over the period July 1963 to July 1973 the expected duration of a completed spell of unemployment was estimated to be 9.9 weeks for men and 6.4 weeks for women.

The data used by Bowers and Harkess was biannual in nature. This meant that their estimates of unemployment duration were based on one register.[16] Gregory and Paterson (1980) and Hason and De Broucker (1982) were able to use the gross flows between successive registers in producing their estimates of duration. Gregory and Paterson used a formula similar in effect to that of Bowers and Harkess. Unfortunately their study was primarily concerned with explaining fluctuations in duration by age and sex and they do not actually report their computations for duration. Hason and De Broucker adopted a more sophisticated approach in their analysis. Having estimated transition probabilities from the gross flow data they then proceeded to derive a "hazard" function by fitting a smooth curve through these points. Having established their function they were then able to make three calculations that are of particular concern to us. First, they estimated that, in 1980, the average duration of a completed spell of unemployment was 8.7 weeks for women and 10.2 weeks for men. Second, they reported that 55.2 percent of spells ended within one month but that 45 percent of unemployment is accounted for by spells exceeding three months. Finally, they found that 44.3 percent of spells end in labour force withdrawal.

In general, the data on estimated completed spells of unemployment would seem to support the hypothesis that spells of unemployment are short and the result of utility maximizing search decisions on the part of workers. However, Hason and De Broucker's findings warn us that, although the average duration of a spell of unemployment may be short, such a result is not inconsistant with the bulk of unemployment being concentrated in spells of long duration. In addition, their finding that such a large proportion of unemployment spells end in labour force withdrawal calls into question the reality of terming a period of unemployment a period of search.

Just as the estimates of average completed duration say nothing about the variation about the average, they also have nothing to say about the distribution of unemployment spells amongst individuals. The implication of search theory is that multiple spells of unemployment are rare because individuals use their period of unemployment to obtain jobs with which they are happy and therefore in which they will remain employed. Akerlof and Main (1980) and Trivedi and Baker (1982) dispute this assumption. Akerlof and Main report for the US that in 1976, 34 percent of all persons with some unemployment had more than one spell and more than half of all spells were suffered by such persons. In Australia, Trivedi and Baker found that 17.6 percent of persons experiencing some unemployment in 1979 incurred more than one spell and that multiple spells accounted for 36.0 percent of all spells. Such findings make it difficult to sustain a belief that all spells correspond to a stereotypical spell, in which the person out of work is continuously searching for a new job and the unemployment is sandwiched between jobs of long tenure.

8. CONCLUSION

In this chapter we have examined a number of avenues of empirical research that are of relevance to search theory and to search theory's explanation of the level and changes in the level of unemployment. Section 2 focused on attempts to directly test the search model using microeconomic data. Such experiments were able to establish that individuals did respond in a manner predicted by search theory. This finding was confirmed by micro studies of the impact of unemployment benefits on individual spells of unemployment duration considered in Section 3. In this section we also observed that a number of studies at the aggregate level had established a positive statistical relationship between changes in the rate of unemployment benefits and changes in the level of unemployment. Despite the fact that an alternative theory predicts the same results, these findings were considered to be consistent with the search based hypothesis that increased unemployment was partially the result of unemployment-benefit induced search. Section 4 reviewed the literature on the discouraged worker effect and found the empirical findings to be in accord with the hypothesised search behaviour of individuals. Efforts to classify unemployment according to type were examined in Section 5. These studies show, for the countries concerned, that a considerable amount of unemployment can be classified as structural or frictional and that the level of non-demand-deficient unemployment, at any given level of unemployment, has generally increased over a period of rising unemployment. The first of these findings indicates that there is considerable potential for attributing a large portion of unemployment to search. The second finding is consistent with changed search activity as a possible explanation for rises in the level of unemployment. In Chapter 4 we observed that our simple search model could be used to provide a theoretical underpinning for the observed relationship between unemployment and vacancies. In Section 6 we examined the empirical attempts to formalize this relationship and to test for shifts in it over time. The outcome of these varied endeavours confirmed the existence of a significant UV relationship in a number of countries which appeared to move outward over time. Although some of this movement undoubtedly resulted from measurement error, most writers were prepared to attribute it to changes in labour supply associated with longer duration of job search. Finally, we turned our attention to those studies attempting to estimate the duration of unemployment. In support of a search explanation of unemployment we noted that most writers had found the average duration of a completed spell of unemployment to be short and that a very large proportion of those entering unemployment left within a few weeks. However, countering these findings were those papers which showed that the unemployment existing at any point in time tended to be concentrated in spells of long duration and that a large proportion of all persons experiencing unemployment experienced more than one spell.

In conclusion, our survey of the literature has indicated that the search model does characterise the behaviour of individuals in the labour market. The evidence that at least part of the unemployment problem currently being experienced in many countries results from changed search activity is less convincing but, nevertheless impressive. In Part 3 of this thesis, we turn to an analysis of the New Zealand situation in order to ascertain to what extent the recent rise in unemployment, observed in Chapter 2, can be explained by the search model. Unfortunately, in doing so, we will be confined to those tests that make use of aggregate data. Micro data of the type used in the research surveyed in Section 2 of this chapter is not available in New Zealand.

NOTES

1. This survey is reported in Sobel and Folk (1965).

2. See Hamermesh (1977) for details.

3. The papers included Maki (1975), Grubel, Maki and Sax (1975) and Maki and Spindler (1975). Maki and Spindler (1975) generated a considerable debate in the literature. Interested readers should see Holden and Peel (1976), Cubbin and Foley (1977) Nickell (1979a) Saywer (1979) and Spindler and Maki (1979).

4. Spindler and Maki (1979) have developed a somewhat similar model in their rebuttal of the suggestion that their estimating equation lacked sufficient theoretical backing.

5. See Kingston and Burgess (1975).

6. This point is noted by a number of writers including Hamermesh (1977).

7. Subsequent work by Barron and Gilley (1979) and Barron and Mellow (1979) indicated a decline in search intensity as unemployment benefits rose and therefore added further support to the hypothesis that increased leisure is consumed rather than increased investment being made in search.

8. Baily (1977b) and (1978), Stafford (1977) and Flemming (1978) ignore the fact that empirical work had failed to establish a relationship between unemployment benefit and search to develop models of unemployment benefit as insurance for workers. Criteria are developed by which the optimal benefit can be set. Basically the papers are exercises in welfare economics. Somewhat surprisingly however they choose to neglect the role of leisure.

9. A detailed definition of these terms is provided in Chapter 8.

10. An explanation of the respective methodologies is provided in Chapter 8.

11. See for example Hughes (1974), Thirlwall (1974) Hicks (1977) and Armstrong and Taylor (1981).

12. The extreme to which concern over the model building process was taken is well reflected in the work of Warren (1977 and 1980).

13. We consider Salant's argument in detail in Chapter 7.

14. A stationary state of the register may be defined as a situation in which the total stock and the numbers in each duration group are not changing because the flows of people leaving the register

are exactly balanced by the flow of new registrations and by the lengthening duration of unemployment of those who remain on the register.

15. Salant arbitrarily chose the gamma density as the functional form of the escape rate density.

16. In fact they used an average of the two biannual registers modified for seasonal fluctuations.

PART THREE

EMPIRICAL ASPECTS OF NEW ZEALAND'S UNEMPLOYMENT

Part Three applies the tests of search theory identified in Part Two.

CHAPTER 6

MEASURING UNEMPLOYMENT, HIDDEN UNEMPLOYMENT AND DISCOURAGED WORKERS IN NEW ZEALAND

1. INTRODUCTION

As the recorded level of unemployment has risen in New Zealand, closer attention has been given to the indicators used in measuring the concept. A "good" measure of unemployment is important. It is equally important to be aware of the limitations of the available data. In this chapter we will be concerned with answering two questions: Are New Zealand's indicators of unemployment adequate? If not, what can be done about them? In addition to attempting to provide answers to these issues we shall also investigate the phenomenon of the discouraged worker in an attempt to test the search hypothesis that the number of discouraged workers is inversely related to the level of economic activity.

The chapter is arranged in the following manner. Section 2 examines the theoretical and statistical definitions of the concept of unemployment and notes some of the issues hindering the application of the statistical definition. A general discussion of the types of data collection procedures is undertaken in Section 3. Section 4 reviews New Zealand's official unemployment indicators and the problems associated with them. In Section 5, we turn our attention to attempts at modifying existing unemployment data. One of the results of such modification is the production of estimates for the hidden unemployed. In this section we pay particular attention to identifying the number of workers whose unemployment is "hidden" because of measurement error and the number of workers whose unemployment is "hidden" because they have become discouraged. This emphasis enables us to test the search theory prediction that the number of discouraged workers varies counter-cyclically. Section 6 concludes.

2. THE CONCEPT OF UNEMPLOYMENT

The definition of unemployment involves three distinct but related aspects: its theoretical definition, its statistical definition and its definition as commonly understood by society at large. If all three are widely divergent then dialogue becomes distorted and unnecessary confusion entres the debate about what constitutes unemployment; how much of it there is; what its effects are and what can be done about it.

The population can be divided into those people in the labour force and those not in the labour force. The labour force consists of those people who are employed and those who are unemployed but would like to be employed. This definition of unemployment is somewhat incomplete since, in theory, virtually anyone would be willing to be employed in return for some extraordinarily generous compensation package. Thus economists have found it necessary to resolve this dilemma by defining unemployment in terms of an individual's willingness to be employed at some prevailing "market" wage. A variant of this definition is implicit in the diagrammatic representation of the simple labour market model developed in Chapter 3. Here, a worker is unemployed if, given the mean market wage and its known distribution, he wants a job at a wage within the known distribution but is unable to secure one acceptable to him.

This theoretical definition of unemployment is one which approximates the everyday use of the term. It is also a definition that is able to incorporate unemployment resulting from a variety of causes[1] and is readily translated into a statistical definition for purposes of measurement.[2]

Two aspects must be kept in mind when defining unemployment for statistical purposes. First, the statistical definition should reflect the theoretical definition (and both should reflect the common understanding of the term). Second, the definition should be operationally useful. To ensure that both of these requirements are met specific procedures must be followed. To begin, the concept of unemployment should correspond to objectively measurable criteria and should depend as little as possible on personal opinion and subjective attitudes. The cost of data collection and access to the relevant data should be carefully considered. There is little point in defining unemployment in such a way that data collection is impossible or so expensive that the costs outweigh any of the benefits. As a concession to the fact that the data collected will be required for different applications the concept used and the method employed in collecting the data should permit the presentation of homogeneous components or subtotals. Finally, because economists depend on reliable, consistent data over reasonable periods in order to validly apply their techniques, the concept of unemployment chosen should not be subject to frequent and radical change.

An ideal statistical definition of unemployment should include all persons who are without work and who are willing and able to work for pay or profit. Such a definition therefore includes a variety of concepts. It has a "condition concept" - that of being without a job. It has an "activity concept" - that of actively seeking work. It has a "psychological concept" - that of desiring a job. Finally, it has a "physical concept" - that of being able to do a job. Unfortuantely determining the facts with respect to each of these elements is difficult because they involve a highly subjective situation in which the intent and desires of the individual are extremely important. Even the apparently simple determination of whether a person is "not at work" can be difficult. For example, are the members of a farm family at work or not during the inactive months (or even the active months in some circumstances) on the farm? Is the industrial worker on vacation, on strike, or temporarily laid off, working or not working? How many hours per week must a person work before he is considered employed? Does it make any difference whether he wants less than forty hours work or whether he wants full-time employment? Should the amount of money a person earns be considered in defining unemployment? These are just some of the types of questions encounted in trying to arrive at a definition of whether a person is employed or unemployed.[3]

The requirement that a person should be able to work before being listed as unemployed also produces a number of difficult questions. There is no generally acceptable definition of the unemployable person. If an individual is hospitalised, it is fairly clear that he is unable to work. On the other hand some physical disabilities and some diseases such as an arrested case of tuberculosis or a cardiac condition may or may not make him unable to work. Frequently such a person will be able to work at some jobs under some conditions but not under others. An exact determination, therefore, of whether an unemployed individual is able to work would require a physical examination of his abilities in relation to the physical demands of the job he wants - and perhaps also a measure of whether the job he is able to perform exists in his labour market. Clearly, such an objective determination is impossible in dealing with a considerable number of individuals, and a decision as to employability is therefore, necessarily, subjective in nature.

The third criterion, willingness to work, is normally expressed by persons actively looking for work by, for example, registering with an employment agency, placing or answering advertisements and applying for jobs, etc. However, the test of willingness to work should not necesarily exclude those who do not take active steps to look for work in the belief that no jobs are available for them either because of a general lack of demand or because of their lack of qualifications, sex, race or some other distinguishing element. This kind of "inactive" or "hidden" unemployment is much more difficult to identify but it may constitute an important feature of the labour market.

The above listing of some of the problems associated with counting the number of unemployed indicates the complexity of developing a definition of unemployment which is satisfactory for statistical purposes. Such problems will contribute to the divergence of definitions between countries as each country seeks to implement its own solutions to them. Other reasons for discrepancies in definitions between countries arise out of economic, political and social considerations. One concept of unemployment may satisfy a totalitarian society in which individual freedom and initiative in economic spheres is at a minimum. An entirely different concept may be necessary in a democracy. Similarly, unemployment in an agricultural economy may be differently defined from unemplyment in an industrialised economy.[4] In the next section we will consider the various methods used throughout the world for producing unemployment statistics and in Section4 we will review New Zealand's unemployment data.

3. GENERAL METHODS OF MEASUREMENT

There are several sources of unemployment data used in the calculation of official national aggregate unemployment rates. These sources include census data, administrative data, and survey data.

3.1 Census Data

In most countries questions on labour force activity are included in the population census and as a result very detailed information about unemployed persons is available from this source. However, because the collection is only undertaken intermittently and takes time to process, the census can provide only historical statistics of unemployment. Census data is therefore of little value for annual international comparisons of unemployment or as a basis for policy decisions. It is, however, of some value within countries in providing bench-mark data from which to evaluate other measures of unemployment, although in using the data in this way we must keep in mind the fact that because of problems of defining unemployment and the difficulty of framing a sufficient number of questions within the compass of a self-enumeration questionnaire, the unemployment figures obtained from population censuses generally differ, sometimes substantially, from those obtained from other sources. In addition, changes in the questions asked from one census to the next will mean that unemployment data from successive censuses are not strictly comparable.

3.2 Administrative Data

Administrative data refers to material collected as a result of administrative procedures the primary aim of which were not the collection of unemployment statistics. There are two forms that this type of data usually takes - unemployment insurance data and unemployment registration data. Unemployment benefit or insurance is payable to unemployed persons in many countries who meet the requirements stipulated in the legislation of that country. Usually, the claimant must be a permanent resident of the country concerned, satisfy a means test, be unemployed (as defined by the relevant act), willing to work and registered with an unemployment office. In some countries - those which operate a system of unemployment insurance as opposed to an unemployment benefit - the jobless claimant is required to have been on a payroll in covered employment prior to becoming unemployed. In addition, he must have had a requisite level of earnings or a sufficient period of covered employment, or both, during a specific time - the base period.

Unemployment insurance (or benefit) statistics have the unique advantage of permitting the calculation of the total volume of compensable unemployment during a specified period. However, difficult problems do arise with the use of this type of data. The interpretation of the level and movements in the series requires a detailed knowledge of eligibility conditions specified in legislation and of the administrative procedures of the government agency concerned (Cameron 1978). In addition, some account is required to be taken of unemployed persons who fail to file for unemployment benefits. Many unemployed workers meet all the prerequisites for unemployment compensation but are not included in the count because they fail to file claims. Often such workers expect to get another job quickly or, being professionals or skilled workers, are not accustomed to experiencing unemployment.

It is possible that the number registered as unemployed can be used to measure differences in trend from a common base year for which comparative rates of unemployment are available from other sources - such as a survey of unemployment or a census of the unemployed. However, there are a number of problems which can make this analysis difficult. First, many countries do not have a survey of the unemployed.

Second, the period of time between censuses is typically quite long. Third, slight changes in the definitions and procedures used to compile the statistics often occur. Finally there is the problem of changes in the coverage of the registered unemployment figures.

Strictly, defined, "unemployment coverage" is the numerical relationship (expressed as a percentage) between two sets of unemployment statistics differently collected. However, the definitions of unemployment must be such that all members of the smaller set are also members of the larger. If such conditions are met a study of the coverage of registered unemployed might establish the extent to which the statistics can be relied upon for purposes of measuring the level and movement in unemployment, both general and sectoral.

While the census is not free from inaccuracies it is at least designed to provide comprehensive measures of unemployment. Registered unemployment figures, on the other hand, are a product of an employment service and are a count of persons who claim to be unemployed. For various reasons, it is fair to suppose that the registration method of computing unemployment is not only more limited in scope but may also generate larger and less predictable inaccuracies than the census. There are a number of reasons why the number registered as unemployed will understate the true level of unemployment. Firstly, registration with the unemployment service is voluntary. Although it is necessary to register in order to qualify for unemployment benefit, some unemployed people, for example skilled workers who do not expect to be unemployed for long, may not wish to claim unemployment benefit and prefer to find work through other means (Green 1971). Others may not register because they are not eligible for unemployment benefit. Married women whose husbands earn more than the limit allowed by the means test fall into this cateogry. Secondly, part-time and casual work-seekers are recorded as inactive and are therefore not included in the unemployment statistics. However, other forces tend to overstate the number of registered unemployed. There are delays involved in recording the placement, lapsing and registration of persons who are presumed to be no longer unemployed. Furthermore, people may falsely claim to be unemployed in order to obtain unemployment benefit. It is not clear how, on balance, these tendancies work out.

The question arises whether the known limitations of registered unemployment statistics, which arise as a result of the method of collection, militate against their use as general and sectoral measures of unemployment and as indicators of changes in the level of economic activity.

3.3 Survey Data

The periodic labour force survey, which was pioneered by the United States and is currently being used in several other countries, is considered one of the most reliable methods of unemployment data collection. Its main advantage is that, given a uniform definition of unemployment, the results of such surveys are likely to be directly comparable with little adjustment, since virtual universal coverage appears to be characteristic of them. Such surveys usually take the form of a multi-stage area sample of dwellings covering something less than 1 percent of the population. The information is obtained from the occupants of selected dwellings by carefully chosen and specially trained interviewers. These interviewers ask certain labour force oriented questions, the answers to which enable estimates to be made of the numbers and characteristics of persons employed or unemployed or not in the labour force. The population survey provides estimates of the number of unemployed persons, their demographic characteristics, whether they are looking for full-time or part-time work, duration of unemployment and the occupation and industry of their last job.

The areas in which the household survey technique is strongest is in detailing the personal characteristics of workers - age, race, sex, marital status, occupation. The method is quite weak however, in describing the distribution of employment and unemployment by industrial classification or geographical location (Runyon 1972). There are other limitations of labour force survey data which need to be taken into account. The chief of these is that they are estimates based on information obtained from occupants of a sample of dwellings and are therefore subject to sampling error; that is they may differ from the figures that would have been produced if information had been obtained from the occupants of all dwellings (Bregger 1971). Sample size places a restriction on the amount of detail that can be provided by the survey, since disaggregation should not proceed past the point where the sampling variability makes the figures useless for various purposes. Sampling variability also limits the capacity of the survey to measure small month to month changes in unemployment. In months other than those in which substantial change has taken place it might not be plausible to argue that an apparent movement is statistically significant. In addition to the imprecision due to sampling variability, inaccuracies may also occur as a result of imperfections in reporting by interviewers and in the answers given by respondents. However, it has been argued (Cameron 1978) that because errors of this kind may occur in any collection, whether it be a full count or a sample, a sample survey may be preferred because the individual attention to a sample of respondents may reduce non-sampling error to such an extent as to outweigh the uncertainty stemming from sampling error.

4. OFFICIAL MEASURES OF UNEMPLOYMENT IN NEW ZEALAND

The definitions of unemployment presently adopted in New Zealand have been developed from both theoretical and empirical (pragmatic) considerations (Kay 1983). However the pragmatic measurement effort has usually been dominant with the contribution of rigorous "scientific" theory to the conceptualization of unemployment being kept at "arms length" (Endres 1980).

4.1 Census Unemployed in New Zealand

The current Census definition of unemployment, as reported by Vollweiler (undated) is

'Unemployment' refers to persons aged 15 years of age and over who are unemployed and seeking work. The following persons are not considered unemployed according to the Census definition:

(a) persons on temporary or indefinite lay-off on the day of the Census,

(b) persons not currently working, but who had made arrangements to start a new job subsequently;

(c) persons available for work but not 'actually seeking' work;

(d) persons out of work due to illness, accident or industrial dispute.

The enumeration of the unemployed from the Census is derived from a count of those who tick the box on the census forms indicating that they are "unemployed and seeking work". The scope that exists for variation in the interpretation of the question by respondents is therefore large and the precise meaning of what is actually measured will always remain uncertain. This problem is exacerbated by the nature of the alternative responses provided for in the "employment status" question of the Census. For example, will a woman who, we will assume, should be correctly classified as unemployed, record her status as such or will she record her employment status as "unpaid household duties" because that is the major day to day activity she is involved in while searching for a job?

Assuming, counterfactually, an accurate and consistent response to the "employment status" question in the Census, we would arrive at a measure of unemployment that makes no provision for distinguishing between those persons seeking full-time and part-time work - although the presumption is that such unemployed persons are seeking predominantly full-time employment (Kay 1983).

Notwithstanding the above, the two major drawbacks to the use of census data on unemployment in New Zealand are (a) the relative infrequency of the Census (once every five years) and (b) the substantial changes in the meaning of the unemployment measurement that has occurred from census to census (Endres 1980).

4.2 The Registered Unemployed in New Zealand

The Department of Labour definition of unemployment is:

> Any person seeking work and legally entitled to work in New Zealand may enrol with the Employment and Vocational Guidance Service of the Department of Labour. This could include married women, persons over 65 years old, those seeking part-time, seasonal or vocational work, and indeed people who already have a job. Enrolment by itself does not confer any automatic rights, such as to unemployment benefits. Of those enrolling with the Service only those currently out of work who are available for and willing to accept a full-time job (i.e. a job for 30 hours or more per week), are classified as 'registered unemployed'.
>
> (Vollweiler undated)

The unemployment statistics are collected and collated manually from the administrative records of the Employment and Vocational Guidance Service. Persons seeking this Department's assistance in obtaining work enrol at one of the offices in the 22 Employment Districts throughout New Zealand. The administrative records then trace these persons' progress through the system in terms of their subsequent referrals and placements.

There have, over the years, been changes in the frequency of the analysis of these records and slight changes in the definitions and procedures used to compile them. Although the main advantage of unemployment registrations is the frequency of observation (data is currently collected from the District Officers monthly), the quality of this information is limited. Some indication of the degree of this limitation is provided by an analysis of the coverage of registered unemployment data to Census unemployment data.

In Section 3.2 we noted that in order to calculate unemployment coverage the definitions of unemployment must be such that all members of the smaller set are also members of the larger. In New Zealand this condition is not met. Census unemployment differs from registered unemployment in at least the following ways. (a) The Census definition of unemployment includes persons seeking part-time employment as unemployed, but persons who are not willing to accept a full-time (30 hours or more a week) job are not included in the figures for registered unemployment. (b) Persons without a job and currently available for work, who have made arrangements to start a new job, are classified as unemployed in registration data but not in the Census data. (c) Persons who are on special work schemes are not classified as unemployed in the registration measure but there is a possibility that some of these people may record themselves as unemployed in the Census (Braae and Gallacher 1983).

Despite the fact that registered unemployment data is not, strictly speaking, a subset of Census unemployment we have calculated the ratio of the former to the latter for the last six censuses. The results, for total recorded unemployment, are as follows.

Year	Coverage
1956	0.008
1961	0.034
1966	0.043
1971	0.069
1976	0.197
1981	0.780

To the extent that these figures measure the coverage of registered unemployment, the results are quite disappointing. When coverage is examined by sex the variation is even greater. Coverage has varied from a low of 0.013 (1956) to a high of 0.810 (1981) for males and from 0.003 (1956) to 0.766 (1981) for females. The high degree of variability of the coverage of registered unemployment figures has thrown considerable doubt on their reliability for measuring the general level of unemployment and for comparing sectoral unemployment rates. In addition, it is claimed that registration figures will not be particularly useful in indicating trends in unemployment over time as an increase in numbers registered may not necessarily indicate a rise in unemployment, but merely an increase in the propensity to register (Braae and Gallacher 1983).

Given that unemployment registration is not compulsory and that married women, in particular, often have little incentive to register, the foregoing warnings about the use of registration data seem reasonable. However, the implied assumptions that Census data is a "good" indicator of unemployment may not be correct. The term "looking for work" may be interpretted far too liberally by some respondents to the Census resulting in a considerable overstatement of unemployment.[5] In times of high unemployment the ratio of those who misstate their unemployed state to the real unemployed will decline. In addition, increasing levels of unemployment, which force women into the work force to make up the income lost during the periods of unemployment experienced by the husband, changing social attitudes, improved survey techniques and more knowledgeable responses may have reduced the degree of overstatement in the Census unemployment measure. To the extent that such a change has taken place, we are provided with an alternative explanation for the variation in the coverage of registration data. It is an explanation that does not lead to the condemnation of registration data that has become common in the New Zealand literature (see Poot and Brosnan 1982).

Even given that the Census data on unemployment is an accurate indicator, the observations we have made, in reference to the coverage of registration data, may not result from any change in the propensity to register as unemployed. The observations on unemployment, both registered and census, are taken from spells that are currently in progress. If those who register are characterized by long spells and those who don't by short spells, then during periods in which the duration of registered unemployment rises relative to the duration of non-registered unemployment, the coverage of registered unemployment will rise even if a fixed proportion of the newly unemployed continue to register. In other words, the increased coverage may be due to changes in the distribution of the duration of unemployment between registrants and non-registrants rather than to an increased proportion of registrants.

In the event, it is reasonable to expect that all of the factors canvassed here are impacting on our unemployment measures. Thus, while we do not agree completely with Braae and Gallacher's explanation for the variation in coverage, we do support the call for "accurate information".

4.3 Unemployment Rates

An unemployment rate is usually expressed in terms of measured unemployment divided by the measured labour force. The measured labour force is equal to measured employment plus measured unemployment. Thus, before identifying different measures for the unemployment rate in New Zealand, we must first consider the concept of employment and its measurement.

The concept of employment that we are interested in is the number of people at work. Two sources of data on employment are available in New Zealand. The first is from the Census. The second, derived in part from the Census, is the intercensal labour force estimates prepared by the Department of Labour and published by the Department of Statistics.

The Census definition of employment, provided by Vollweiler (undated), is as follows:

> Persons in employment consist of all those 15 years of age and over, who are at the time of the Census working for 20 hours or more each week either:
>
> (1) for financial return; or
> (2) assisting a relative in a gainful occupation without any financial return.

This definition includes an employer of labour in own business or profession, a person working on own account and not employing labour, a person working for wages or salary and a relative assisting in business and not receiving wages. All those engaged less than 20 hours per week are classified as being "not actively engaged" or unemployed.

As with unemployment data, the two major drawbacks with Census employment data are its infrequency and changes in the definition from census to census.[6]

Although the Department of Labour adopts the same definition of employment as that for the Census, the two statistics differ because of differences in the method of calculation. The intercensal employment estimates are based on both the Census findings and the Department of Labour's Survey of Employment (now held quarterly but prior to 1980 it was held six monthly). Kay (1983) describes estimated intercensal employment as being obtained from the formula:

$$E_E = (WP + FE + 1/2\ PE + J) \qquad (4.1)$$

where

WP = the number of working proprietors;

FE = the number of full-time employees, including armed services;

PE = the number of part-time employees;

J = the number of people on job creation schemes.

Census employment on the other hand is described by the formula:

$$E_C = (W20 + R) \qquad (4.2)$$

where

W20 = the number of persons including armed services working for pay or profit for 20 hours or more per week (excluding unpaid relatives assisting);

R = the number of unpaid relatives assisting who work 20 hours or more per week.

Thus the Census definition of the labour force is given by the formula:

$$LF_C = E_C + UC \tag{4.3}$$

where

UC = census unemployment,

and the Department of Labour's intercensal labour force estimate is given by the formula

$$LF_E = E_E + UR \tag{4.4}$$

where

UR = registered unemployment.

We are now able to identify two unemployment rates for New Zealand. The Census unemployment rate (UCr), obtainable every five years and the registered unemployment rate (URr), obtainable much more frequently. These unemployment rates are provided by the following formulae:

$$UC_r = UC/LF_c \tag{4.5}$$

$$UR_r = UR/LF_E \tag{4.6}$$

Conceptually, our two measures of unemployment will differ because $UR \neq UC$ and $LF_E \neq LF_C$.

5. MEASURING HIDDEN UNEMPLOYMENT AND DISCOURAGED WORKERS IN NEW ZEALAND

5.1 Introduction

The registered unemployment rate, derived from (4.6), is New Zealand's official measure of unemployment. However because of the problems associated with its measurement, discussed in Section 4, and because it takes no account of discouraged workers (see Kay, 1983 and Vollweiler, undated), a number of attempts have been made to calculate an alternative measure that includes the "hidden" unemployed. In Section 5.2 we will examine the method developed by Gallacher (1974) and revised by Braae and Gallacher (1983). The Gallacher technique relies essentially on an analysis of intercensal trends in labour force participation. An alternate, econometric approach was developed by Walsh (1978) and this is discussed in Section 5.3. In commencing this chapter we indicated our concern with obtaining estimates of hidden unemployment that would enable us to test the search theoretic hypothesis that the number of discouraged workers varies countercyclically. Unfortunately, the results reported in the studies by Gallacher, Braae and Gallacher, and Walsh, do not permit such a test. This is because no substantial effort has been made in these studies to distinguish between the unemployed who are "hidden" because of measurement problems and those who are hidden because they have become discouraged.[7]

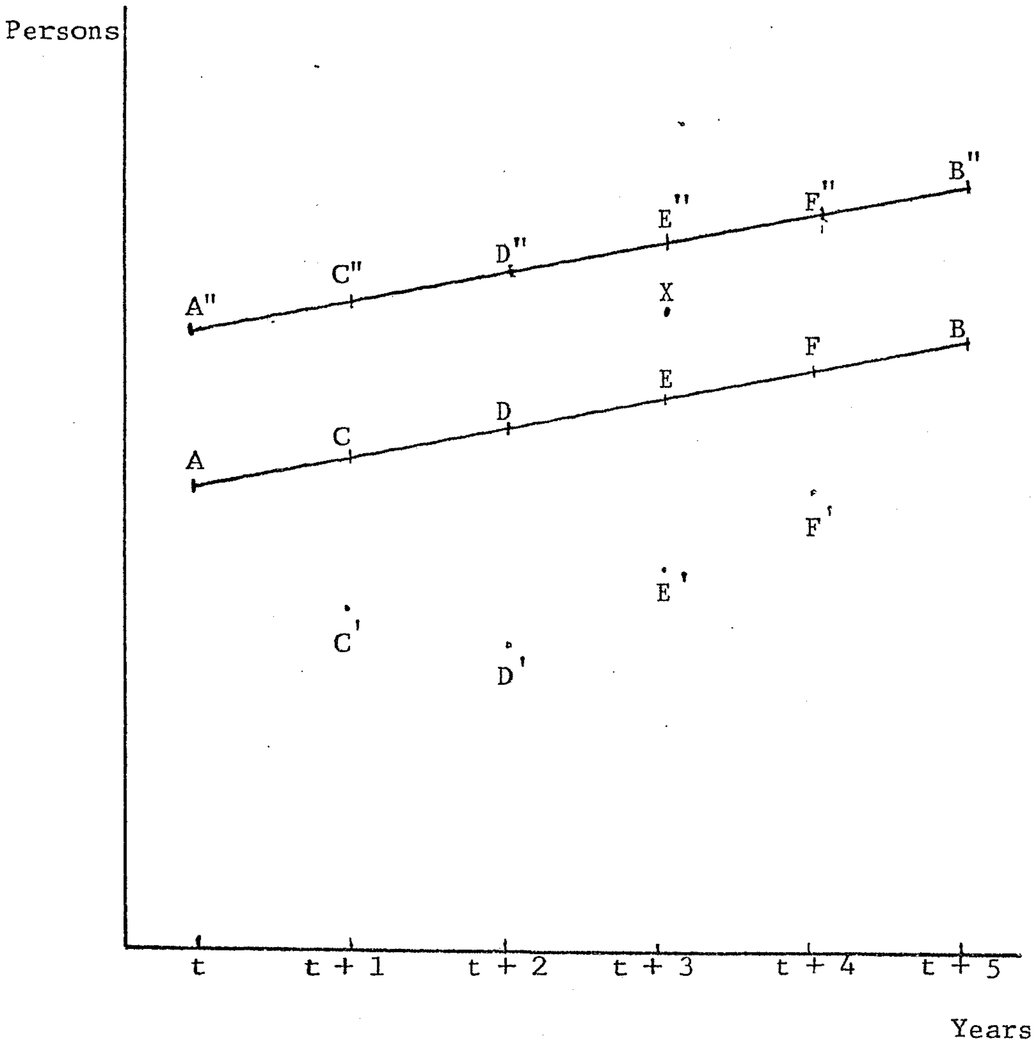
In Sections 5.4-5.6 we attempt to estimate separately, the amount of unemployment that is "hidden" because of measurement error and the amount of unemployment that is "hidden" because of the discouraged worker phenomenon. Finally, in Section 5.7 we review the only published data on unemployment that is based on a survey of labour force members and which attempts to identify the discouraged workers.

5.2 Potential Unemployment

Gallacher (1974) and Braae and Gallacher (1983) attempt to construct a measure of potential unemployment by using the five-yearly census data to construct a series of potential labour force and subtracting actual (estimated) employment. The potential labour force series is obtained by interpolating labour force participation rates for various subgroups of the population as measured at the Census dates. The smoothly changing participation rates are then applied to actual population data to generate the potential labour force series. Once the potential unemployment series is calculated, hidden unemployment can be assessed by substracting from the potential unemployment estimates the level of registered unemployment.

The usefulness of the measure of hidden unemployment obtained in this manner is, like all such measures, limited by the necessarily restrictive assumptions employed in making the calculation. For our purposes, the assumptions of smoothly changing intercensal participation rates and the use of census labour force data as reference points create difficulties. These difficulties can be explained by reference to Figure A. The vertical axis represents the number of people in the economy and

FIGURE A Calculating Potential Unemployment.



the horizontal axis represents time in years. To begin, we assume that point A corresponds to the Census labour force in year t and point B to the Census labour force in year t + 5. Further, we will assume, for the time being, that no discouraged workers exist at either date. In the simplest case, smoothly changing participation rates will produce a potential labour force, for any period between t and t + 5, at a point on a straight line drawn between A and B if we assume a steady state population.[8] Thus, for our steady state population, the potential labour force in year t + 1 will be C; in year t + 2, D; and so on. Points C' - F' represent the intercensal employment estimates. Thus potential unemployment is C-C' in year t + 1; D - D' in year t + 2, etc. Since we know the number of registered unemployed in each year hidden unemployment is readily calculated. However, the hidden unemployment figure that is derived will be a hybrid of unemployment that is "hidden" because of measurement error and unemployment that is hidden because of the discouraged worker effect.[9]

In order to differentiate the two, Braae and Gallacher (1983) suggest the adoption of either one of two assumptions. The first assumption is based on interpolated non-participation rates and the second is based on interpolated registered to Census unemployment ratios. In either case the authors argue that the division is "indistinct" and "conjectural" and results from the difficulty of knowing where to draw the boundary between the non-registered unemployed and those not in the labour force.

When we drop the assumption that no discouraged workers exist at time t and t + 5, in Figure A, an additional problem surfaces. Assume that the number of discouraged workers at time t is given by A - A" and at time t + 5 by B - B". If the remainder of our former assumptions continue to hold, the actual potential labour force over the period will lie along the line A" - B". However, the measured potential labour force will be found on the line A - B. Consequently, measured potential unemployment will understate actual potential unemployment and hidden unemployment will be underestimated. Whether the "hidden" unemployed resulting from measurement error or the "hidden" unemployed resulting from the discouraged worker effect is underestimated depends upon which of the Braae-Gallacher assumptions is adopted. Under the first assumption, the non-registered unemployed is calculated as a residual and therefore the amount of hidden unemployed resulting from measurement error will be understated. Under the second (preferred) assumption, non-registered unemployment is defined and the number of discouraged workers will therefore be understated.[10]

Braae and Gallacher (1983) admit the foregoing problem and accept that their measure of potential unemployment cannot be used as an indicator of the maximum level of true unemployment during the period 1971 to 1981 because of the downturn in economic activity existing at the time of the 1976 and 1981 Censuses. They argue, however, that earlier Censuses were conducted during a period of near full employment so that their measure of potential unemployment, prior to 1971, would approximate the maximum level of true unemployment. Their calculations

1. Potential Unemployment in New Zealand, 1960–81 (April)

Year	Potential Unemployment			Potential Unemployment Rate[a]		
	Male (000)	Female (000)	Total (000)	Male %	Female %	Total %
1960	3.6	4.1	7.7	0.54	1.87	0.87
1961	2.3	0.1	2.4	0.34	0.04	0.27
1962	11.2	5.4	16.6	1.62	2.29	1.79
1963	12.9	12.0	24.9	1.83	4.84	2.61
1964	12.0	11.8	23.8	1.66	4.54	2.43
1965	6.3	8.3	14.6	0.86	3.07	1.45
1966	5.4	0.9	6.3	0.72	0.32	0.61
1967	– 2.0	– 1.5	– 3.5	– 0.26	– 0.51	– 0.33
1968	9.8	15.7	25.5	1.29	5.21	2.40
1969	– 0.5	15.9	15.4	– 0.07	5.10	1.43
1970	– 5.4	11.8	6.4	– 0.70	3.65	0.58
1971	8.0	7.3	15.3	1.02	2.19	1.37
1972	16.6	16.0	32.6	2.07	4.60	2.84
1973	10.6	14.8	25.4	1.30	4.09	2.15
1974	3.6	3.5	7.1	0.43	0.93	0.59
1975	9.8	8.6	18.4	1.15	2.19	1.48
1976	17.9	13.4	31.3	2.06	3.28	2.45
1977	18.0	10.3	28.3	2.06	2.45	2.19
1978	28.1	21.2	49.6	3.21	4.92	3.80
1979	26.9	13.1	40.0	3.07	2.98	3.04
1980[b]	31.4	15.3	46.7	3.58	3.40	3.52
1981[b]	43.5	23.0	66.5	4.93	5.00	4.95

[a] Potential Unemployment as a proportion of Potential Labour Force.

[b] As at February.

Source: Braae and Gallacher (1983).

are reported in Table 1. In the table we can observe that in 1967, for males and females; and 1968 and 1970, for males, potential unemployment was negative. In Figure A, this would involve an observation of estimated employment given by point X and imply the existence of discouraged workers at the Census data. Thus, even for the period prior to 1971, the estimate for potential unemployment will have been less than maximum (or actual potential) unemployment.

A final point concerning Braae and Gallacher's method for estimating potential unemployment is that it assumes the intercensal estimate for employment is accurate. We have seen in Section 4.3 that the intercensal employment estimates differ from the Census estimates in the way they are calculated. Given this difference, estimated employment may differ from what would have been obtained from the Census count.

In concluding, we argue that the methodology adopted in Gallacher (1974) and Braae and Gallacher (1983) is unsuitable for our purposes because it is likely to underestimate hidden unemployment and the distinction between hidden unemployment due to measurement error and hidden unemployment due to the discouraged worker effect is difficult to make. However, this should not detract from the importance of their measurement which was to " ... identify an order of magnitude of the pool of people who are likely to be employed or looking for work on the basis of historical trends in participation rates".

5.3 Errors in Variables and the Number of Unemployed

Walsh (1978) criticised previous models used in estimating hidden unemployment because they neglected the effect on participation of changes in the real wage rate. Walsh, constructs a model for the New Zealand economy which attempts to overcome this omission. The Walsh methodology differs from the econometric approaches outlined in Chapter 5 because it does not assume a full employment level of unemployment but rather argues that the actual full employment labour participation rate (including discouraged workers) is given by the equation:

$$\frac{L^*}{P} = a + bT + c\,\frac{W}{\bar{W}} + d\left(\frac{L^*}{P}\right)_{t-1} \qquad (5.1)$$

where

L^* = full employment labour force,

T = time,

W = the current level of real wages,

$\bar{W}$ = the expected or permanent level of real wages,

P = the population of working age.

L^* is unobservable but is equal to $L + U''$, where L represents the recorded labour force and U'' is the number of hidden unemployed i.e. discouraged workers plus non-discouraged but non-registered unemployed. Since $L/P + U''/P = L^*/P$ by substitution of these new values in (5.1) we obtain

$$\frac{L}{P} = a + bT + c\,\frac{W}{\bar{W}} + d\left(\frac{L+U''}{P}\right)_{t-1} - \frac{U''}{P} \qquad (5.2)$$

Walsh's methodology permits two approaches to be taken from this point. The simplest of the two assumes that

$$\frac{U'}{P} = \beta\frac{U^*}{P} \quad ; \quad \beta < 1 \tag{5.3}$$

where U^* is total unemployment and U' is registered unemployment. Given the observed U' and an estimate of β, we could then estimate U^* (note that Walsh assumed that U' included registered unemployed plus those on special work. However as persons on special work are not unemployed it would seem logical to exclude them from the analysis).

Using the fact that $U' + U'' = U^*$ we can write (5.3) as

$$U'' = (1-\beta)\ U^* \tag{5.4}$$

then substituting again (5.4) finally becomes

$$U'' = \frac{1-\beta}{\beta}\ U' \tag{5.5}$$

This relates the unobservable U'' to observable U' and can be substituted into (5.2) to give

$$\frac{L}{P} = a + bT + c\,\frac{W}{\bar{W}} + d\,\left(\frac{L}{P_{t-1}} + \frac{\frac{1-\beta}{\beta}\,U'}{P_{t-1}}\right) - \frac{\frac{1-\beta}{\beta}\,U'}{P} \tag{5.6}$$

$$= a + bT + c\,\frac{W}{\bar{W}} + d\,\left(\frac{L}{P_{t-1}} + \frac{1-\beta}{\beta}\,\frac{U'}{P_{t-1}}\right) - \left(\frac{1-\beta}{\beta}\right)\frac{U'}{P} \tag{5.7}$$

Redefining $\frac{1-\beta}{\beta} = f$ (5.8)

Then $$\frac{L}{P} = a + bT + c\,\frac{W}{\bar{W}} + d\,\frac{L}{P_{t-1}} + df\,\frac{U'}{P_{t-1}} - f\,\frac{U'}{P} \tag{5.9}$$

This can be estimated by using OLS to obtain a value for f and hence β.

A more complicated alternative, put forward by Walsh, is to assume that U' is a random variable with expected value βU^*. This requires a more complicated estimation procedure but the model is essentially the same.

The main advantage of the Walsh approach is that it does not depend upon the assumption that the Census unemployment figures are accurate. Unfortunately Walsh is required to assume that there is a fixed ratio between observed unemployment and unobserved unemployment. This assumption cannot be tested and has been commented on by a number of writers.[11] There are a number of reasons for believing that a fixed proportional relationship does not hold. First, the propensity to register as unemployed will differ, at a given total level of recorded unemployment, depending on whether the economy is in the upswing or downswing phase of the trade cycle. In the downswing workers will be increasingly pessimistic and neglect to register (if they cannot receive the dole) producing a relatively small β. In the upswing they will be increasingly optimistic and therefore more likely to register. Thus, the introduction of a third variable - the likelihood of obtaining a job - will have an impact on the hypothesised relationship. Second, it is likely that, in the downswing phase of a trade cycle, the proportion of unemployed workers registering will increase. This is to be expected because the harder it is to find a job the more desperate job seekers will be to make use of the unemployment office. It is also highly likely that a larger proportion of the new or recent unemployed will be eligible for the dole. This is because firms will begin to lay off staff that they would normally attempt to retain during minor recessions. These workers, generally prime aged males, will in most cases be eligible for the unemployment benefit. From an administrative point of view the staff of the unemployment service will be expected to cope with a larger volume of registrants than normal. One of the results from a natural decline in their efficiency will be the failure to remove from their lists registrants who have got jobs.

Evidence on the relationship between registered unemployment and census unemployment (U^c), considered in detail by Thomson and Endres (1979), has been promoted as evidence of the instability of the relationship between U' and U^*. However, as Walsh (1979) points out, U'/U^c is not U'/U^* and it was the latter that Walsh assumed constant.

Since $$\frac{U'}{U^c} = \left(\frac{U'}{U^*}\right)\left(\frac{U^*}{U^c}\right) = \beta\,\frac{U^*}{U^c} \quad , \tag{5.10}$$

a rising ratio of U' to U^c, as total unemployment rises, is perfectly consistent with β being constant if U^*/U^c rises as total unemployment rises. However, there is no reason to expect this to happen and the assumption of a constant relationship between registered unemployment and total unemployment is one of the weak links of the Walsh argument.

Another difficulty of the Walsh approach centres on the results (reported in Table 2) that he obtained. The difficulty arises from the fact that the 1966 and 1971 Census enumeration of unemployment actually exceeded Walsh's estimate for the equivalent time, that is $U^c > U^*$. Walsh attempted to justify this result by arguing that there

2. Errors in Variables Estimates of the Number of Unemployed in New Zealand, 1965-81 (April)

Year	EiV Estimated Unemployment			EiV Estimated Unemployment Rate[a]		
	Male (000)	Female (000)	Total (000)	Male %	Female %	Total %
1965	1.1	14.5	2.5	0.15	0.55	0.25
1966	0.6	12.6	1.9	0.08	0.45	0.18
1967	1.7	2.3	4.0	0.22	0.78	0.38
1968	16.5	16.6	33.2	2.16	5.51	3.10
1969	5.5	7.4	12.9	0.71	2.43	1.20
1970	2.5	3.8	6.3	0.31	1.22	0.57
1971	3.0	3.9	6.9	0.37	1.21	0.62
1972	9.5	11.3	20.8	1.18	3.36	1.83
1973	4.8	7.7	12.5	0.59	2.25	1.08
1974	1.0	2.7	3.7	0.12	0.74	0.31
1975	7.7	12.7	20.4	0.91	3.38	1.67
1976	15.4	27.6	43.0	1.79	6.94	3.42
1981[b]	99.9	192.9	292.8	10.8	30.9	18.9

[a] Errors in Variables (EiV) Estimated Unemployment as a proportion of EiV Estimated Labour Force.

[b] As at February and using Walsh formula.

Source: Walsh (1978).

is no absolute barrier beyond which unemployment cannot rise and that therefore the recorded labour force may be greater than the "full employment" labour force. However, he can only do this at the expense of foregoing U'' as a measure of hidden unemployment. This is because

$$U^c = U^r + U^s \tag{5.11}$$

and

$$U^* = U^r + U^s + U^d \tag{5.12}$$

where U^r = registered unemployment

U^s = unemployed workers not registered but searching for a job

U^d = discouraged workers

If $U^* < U^c$ then $U^r + U^s + U^d < U^r + U^s$ and U^d must be negative. Such a result does not have an economic interpretation.

Perhaps a more reasonable defence to this criticism would have been to argue that census unemployment is not a particularly good measure of actual unemployment as it may be prone to considerable overstatement.[12] However even this response must be tempered by the fact that the application of Walsh's methodology to 1981 data (see Table 2) implies that the female unemployment rate is 30.9 percent - a rate which is clearly approaching the realm of fiction.

A final difficulty with the Walsh method, from our point of view, is that it makes no provision at all for the division of hidden unemployment into the "discouraged" component and the "measurement error" component. In the next section, we consider a simple method that will enable us to produce an estimate of the numbers who are hidden because of measurement errors.

5.4 Estimating Census Equivalent Unemployment

As we have previously noted, it is generally considered that the Census unemployment figures are a good indicator of the level of unemployment existing in New Zealand and that registered unemployment data, because of the marked variation in coverage when compared with the Census data, is an unreliable indicator of the unemployment situation. The most common explanation for the variation in the coverage of registered unemployment is considered to be changes in the propensity to register.[13] In Section 4.2 we warned that both the belief that the Census data was superior and the assumption that changes in the propensity to register adequately explain the variation in the coverage of registration data, are too readily accepted. Alternative explanations exist which, although not popular, should not be dismissed as improbable. It would not be unreasonable to expect future research to show that many factors impinge on the adequacy of both Census and registration data as indicators of unemployment in New Zealand.[14] In the meantime we must use the data we have at our disposal, keeping in mind its very obvious limitations and weaknesses.

In this section we propose a method for calculating what we shall term "Census equivalent unemployment" (CU^e). To the extent that Census unemployment data is an accurate indicator of unemployment our measure

FIGURE B The Relationship Between Registered Unemployment and Census Unemployment (Males) by Employment Districts, 1976 and 1981.

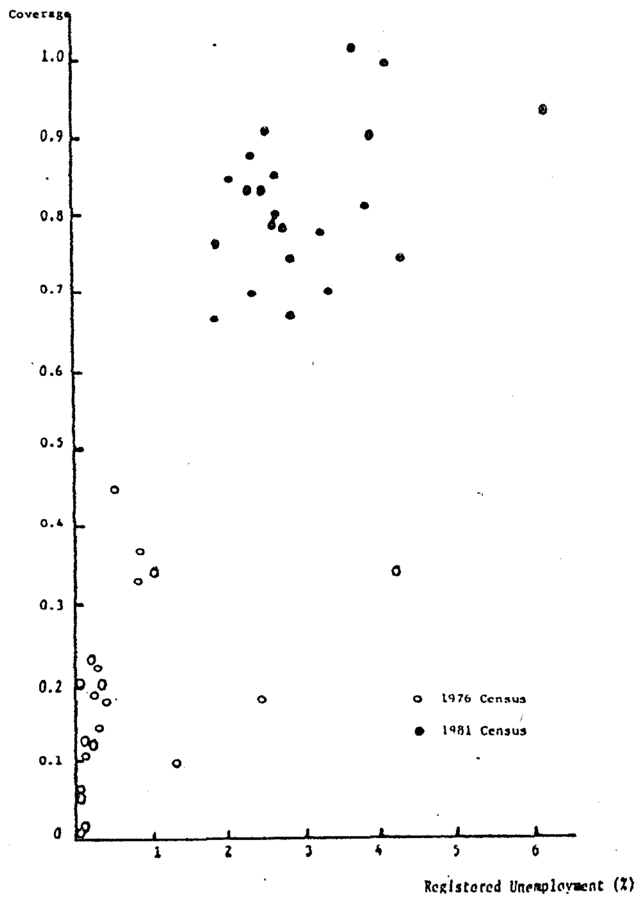
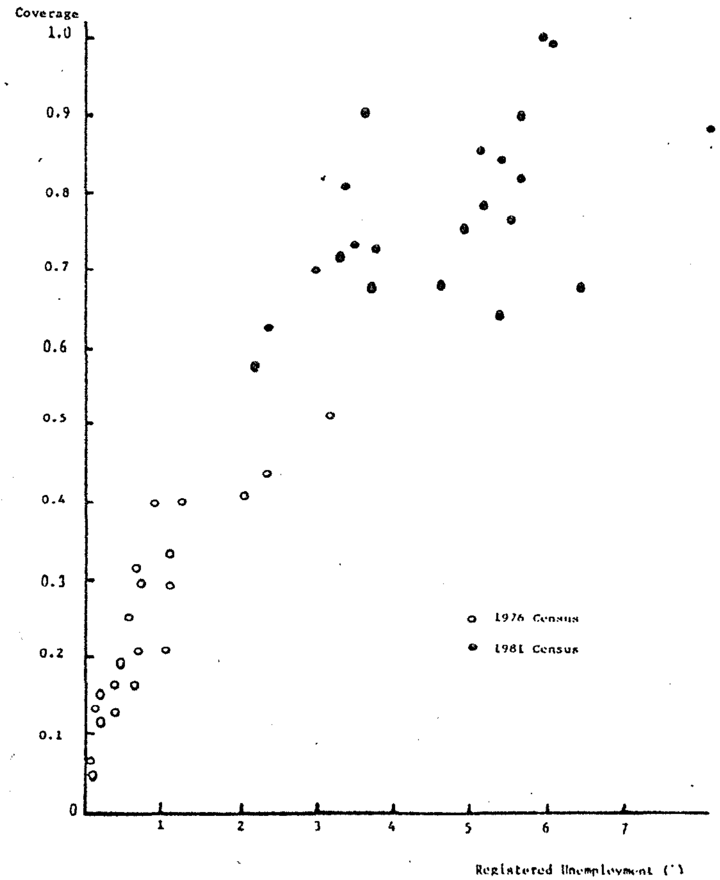


FIGURE C The Relationship Between Registered Unemployment and Census Unemployment (Females) by Employment Districts, 1976 and 1981.



of CU^e will, in the first instance, enable us to estimate the number of workers whose unemployment is "hidden" because of measurement error.

Expanding upon the analysis of Thompson and Endres (1979) and Forer (1982) we plot, in Figures B and C, the ratio of registered unemployment to Census unemployment (the coverage ratio) to the registered unemployment rate for each Employment District of the Department of Labour at the 1976 and 1981 Census dates.[15] The pattern of the data enables us to interpolate a relationship between the coverage ratio and the registered unemployment rate. As indicated by the following equations the fit appears satisfactory.

$$\log \frac{URm}{UCm} = \underset{(-23.324)}{-\ 0.884} + \underset{(28.433)}{0.671} \log URrm \qquad (5.13)$$

$$\bar{R}^2 = 0.951$$

$$\log \frac{URf}{UCf} = \underset{(-31.662)}{-\ 1.159} + \underset{(22.793)}{0.621} \log URrf \qquad (5.14)$$

$$\bar{R}^2 = 0.925$$

where

UR_m = registered unemployed (males),

URf = registered unemployed (females),

UCm = Census unemployed (males),

UCf = Census unemployed (females),

$URrm$ = male registered unemployment rate,

$URrf$ = female registered unemployment rate.

3. Census Equivalent Unemployment in New Zealand, 1960-1981 (March)[a]

Year	Census Equivalent Unemployment			Census Equivalent Unemployment Rate[b]		
	Male (000)	Female (000)	Total (000)	Male %	Female %	Total %
1960	7.3	2.0	9.3	1.10	0.94	1.06
1961	5.2	1.2	6.4	0.76	0.56	0.71
1962	7.3	2.1	9.4	1.06	0.94	1.03
1963	7.7	2.4	10.1	1.10	1.02	1.08
1964	6.8	2.5	9.3	0.96	1.02	0.98
1965	6.6	2.9	9.4	0.90	1.10	0.96
1966	5.7	2.8	8.5	0.76	1.02	0.83
1967	6.9	3.2	10.0	0.90	1.10	0.96
1968	16.1	7.1	23.2	2.12	2.49	2.22
1969	11.7	5.9	17.6	1.54	1.99	1.66
1970	9.1	4.4	13.6	1.17	1.43	1.24
1971	8.8	4.4	13.2	1.14	1.33	1.19
1972	14.8	7.0	21.8	1.88	2.12	1.95
1973	11.3	6.5	17.7	1.40	1.85	1.54
1974	7.5	4.6	12.1	0.90	1.22	1.00
1975	12.6	7.7	20.2	1.49	1.99	1.65
1976	13.8	10.8	24.5	1.61	2.71	1.96
1977	12.4	10.5	23.0	1.45	2.56	1.81
1978	22.5	17.7	40.3	2.62	4.23	3.15
1979	24.3	19.1	43.4	2.82	4.38	3.34
1980	26.3	20.4	46.7	3.05	4.57	3.57
1981	30.8	25.3	56.2	3.55	5.53	4.24

[a] Calculated from equations (5.13) and (5.14).

[b] Census Equivalent Unemployment as a proportion of the April Intercensal Labour Force (except 1981 which is February).

4. Unemployment Hidden Because of Measurement Error: 1960-1981 (March)

Year	Male (000)	Female (000)	Total (000)
1960	6.7	1.9	8.6
1961	5.0	1.2	6.2
1962	6.7	2.0	8.7
1963	7.1	2.3	9.4
1964	6.4	2.4	8.8
1965	6.2	2.8	9.0
1966	5.4	2.7	8.1
1967	6.5	3.0	9.5
1968	11.0	5.6	16.6
1969	9.7	5.0	14.7
1970	8.2	4.0	12.2
1971	8.0	4.1	12.1
1972	11.2	5.9	17.1
1973	9.8	5.7	15.5
1974	7.1	4.3	11.4
1975	10.6	6.6	17.2
1976	11.4	8.2	19.6
1977	10.6	8.2	18.8
1978	11.5	8.9	20.4
1979	10.7	9.0	19.7
1980	8.9	8.8	17.7
1981	3.0	5.7	8.7

Source: Department of Statistics (various, a); Table 3.

Utilizing equations (5.13) and (5.14) we can adjust registered unemployment data, at any date, to produce an estimate of Census equivalent unemployment (UC^e) and the Census equivalent unemployment rate (UC_r^e). Table 3 reports the result of such an exercise for the March quarter from 1960 to 1981. In Table 4 we present the estimates of hidden unemployment due to measurement error calculated by substracting registered unemployment from UC^e.

Clearly this approach has two disadvantages. First, it assumes that the intercensal labour force estimate is conceptually equivalent to the Census labour force measure. Second, it assumes that a statistical relationship based on cross-section (regional) data can be applied to national time-series data. Unfortunately, when confronted by a dearth of labour market data, we, like Braae and Gallacher (1983) and Walsh (1979), are forced to employ very restrictive assumptions. For our purposes, however, the method we have used has a number of advantages. The first advantage is that the number of hidden unemployed due to measurement error can be directly estimated. Second, we do not need to assume smooth intercensal changes in participation rates so that, in further work, the impact of changing economic conditions on participation rates can be analyzed. Third, we do not have to employ Census labour force estimates as our 'full employment' reference points if dates outside of these periods are more appropriate. Finally, we do not have to assume a fixed ratio of registered unemployment to "true" unemployment.

5.5 Discouraged Workers and the Cyclical Sensitivity of Labour Force Participation Rates

Search theory provides a theoretical explanation for the hypothesised concept of the discouraged worker. According to the search interpretation, unemployed workers are said to withdraw from the labour force when, because of the scarcity of jobs, they become discouraged about their chances of obtaining the reservation wage they have set. Consequently, it is argued, labour force participation (of all groups, but especially women) will fall during downswings in economic activity. The phenomenon of the discouraged worker was recognized well before the development of the search theory model and, as we observed in Chapter 5, a number of writers attempted to test the hypothesis that labour force participation is cyclically sensitive. The models developed, and their application to the New Zealand economy, are important in the present context for two reasons. First, they provide an indirect test of search theory. Second, an application of these models to New Zealand data may permit us to determine the extent to which the discouraged worker effect has been contributing to "hidden" unemployment in our labour market.[16] To test for the discouraged worker phenomenon with annual time-series data we utilize the following:

$$(L^g/P^g)_t = a + b\ (E^g/P^g)_t + c\ (1/P^g)_t \qquad (5.15)$$

$$(L^g/P^g)_t = a + b\ (E^g/P^g)_t + c\ T \qquad (5.16)$$

$$(L^g/P^g)_t = a + b\ (E^g/P^g)_t + c\ \log T \qquad (5.17)$$

$$(L^g/P^g)_t = a + b\ (U^t/L^t)_t + c\ (E^t_m/E^t)_t + dT + eT^2 \qquad (5.18)$$

$$(L^g/P^g)_t = a + b\ (U^t/L^t)_t + cT \qquad (5.19)$$

$$(L^g/P^g)_t = a + b\ (U^t/L^t)_t + a\ (\frac{W}{\bar{W}})_t + dT \qquad (5.20)$$

where

L = the intercensal labour force estimate plus hidden unemployment,

P = population over 15 years,

E = intercensal employment estimate,

T = time,

E_m = manufacturing employment (intercensal estimate),

U = census equivalent unemployment rate,

W = real average weekly wage,

$\bar{W}$ = real permanent income,

g refers to designated group which may be male (m), female (f) or total (t)

Equation (5.15) was used by Strand and Dernburg (1964). The addition of $1/P^g$ serves two purposes. First, changes in P^g that are not accompanied by changes in E^g or L^g will cause E^g/P^g and L^g/P^g to vary together. The addition of $1/P^g$ eliminates this possible source of spurious association. Second, $1/P^g$ serves the further purpose of allowing the direction and magnitude of secular trends in L^g/P^g to be detected because of populations close correlation with time. Tella's (1964) work served the basis for (5.16). T is added to account for the long-term (historical) trend in labour force participation rates. (5.17) is a variant of (5.16) and was adopted by Tella (1965), Vroman (1970) and Butler and Demopoulos (1971). The work of Bowen and

5. Data for Tests of the Discouraged Worker Effect (Time-Series)

Year	Labour Force[a]			Population[b]			Employment[c]			Manufacturing Employment[d]	Real Average Weekly Wage[e]	Real Permanent Wage[f]
	Male (000)	Female (000)	Total (000)	Male (000)	Female (000)	Total (000)	Male (000)	Female (000)	Total (000)	(000)	$	$
1960	675.1	214.0	889.1	832.8	835.4	1668.2	667.8	212.0	879.8	223.1	70.14	68.85
1961	685.2	222.9	908.1	853.8	855.9	1709.7	680.0	221.7	901.7	232.4	71.99	70.72
1962	698.1	229.6	927.7	872.4	876.4	1748.8	690.6	227.5	918.1	237.9	72.09	71.78
1963	712.8	235.5	948.3	890.2	896.1	1786.3	705.0	233.1	938.7	244.4	73.50	72.88
1964	714.9	250.4	965.4	909.7	915.5	1825.2	708.0	247.8	955.8	256.4	74.59	73.92
1965	733.4	264.3	997.7	927.6	934.4	1862.0	726.7	261.3	988.0	267.0	76.57	75.57
1966	749.9	280.0	1029.9	938.3	950.9	1889.2	744.2	277.2	1021.4	278.4	77.44	76.78
1967	764.0	292.4	1056.4	948.1	964.6	1912.7	756.8	289.2	1046.0	288.2	75.91	76.44
1968	767.2	292.8	1060.0	960.7	980.4	1941.1	749.4	285.5	1034.9	275.9	76.04	76.20
1969	774.4	301.5	1075.9	976.4	996.6	1973.0	762.6	295.7	1058.3	287.6	77.27	76.72
1970	787.4	315.5	1088.9	996.9	1016.1	2013.0	778.2	311.1	1089.3	303.6	80.62	79.01
1971	797.8	326.3	1124.1	1017.6	1037.6	2055.2	776.2	326.5	1102.7	280.8	85.26	82.79
1972	808.1	331.9	1140.0	1046.2	1065.1	2111.3	783.8	331.6	1115.4	280.1	88.80	86.62
1973	824.5	341.2	1165.7	1077.2	1095.0	2172.2	806.3	347.2	1153.5	293.3	99.78	94.57
1974	841.3	361.4	1202.7	1104.6	1121.1	2225.7	830.2	373.4	1203.6	305.8	96.89	96.56
1975	853.8	371.1	1224.9	1105.9	1128.2	2234.1	841.2	383.9	1225.1	303.3	95.86	96.71
1976	860.9	380.7	1241.6	1106.2	1130.4	2236.6	850.7	395.3	1246.0	307.7	92.13	93.88
1977	852.3	396.6	1248.9	1116.9	1141.3	2258.2	855.5	409.5	1265.0	318.5	91.28	92.18
1978	871.8	427.4	1299.2	1126.4	1151.6	2278.0	848.0	409.3	1257.3	299.2	91.11	91.30
1979	874.0	445.5	1319.5	1132.9	1158.1	2291.0	848.2	426.7	1274.9	305.1	93.75	92.64
1980	872.0	455.1	1327.1	1135.7	1165.0	2300.7	846.3	434.5	1280.8	314.3	101.86	98.01
1981	870.5	463.6	1334.1	1148.1	1188.4	2336.5	838.9	437.1	1276.0	303.8	109.10	104.84

[a] Intercensal Labour Force (April, except 1980 and 1981 which are February) plus Hidden Unemployment (March estimates).

[b] March estimate (based on constant change between official annual estimates).

[c] Intercensal Employment Estimate (April, except 1980 and 1981 which are February).

[d] Intercensal Estimate of Manufacturing Employment (April, except 1980 and 1981 which are February).

[e] Aggregate payout (including overtime, bonus earnings etc.) for one week divided by full-time and part-time employees. (Average of April and October survey except 1980 and 1981 which are averages for February, May, August and November) deflated by annual CPI.

[f] Real Permanent Wage ($\bar{W}$) is given by

$$\bar{W} = W_t + 0.5W_{t-1} + 0.25W_{t-2} \div 1.75$$

where W_t = Real Average Weekly Wage.

Source: Department of Statistics (various, a); Department of Statistics (various, b); International Monetary Fund (1981); Table 4; Department of Labour (1981b).

Finegan (1969) suggested (5.18). Here, Em/E serves as an inverse measure of the relative abundance of the kinds of jobs open to secondary labour force members. A fall in this ratio would signify a change in industry mix tending to enhance the employment opportunities of these groups relative to the employment opportunities for prime-age males. T and T^2 are both inserted to take account, at least in part, of secular changes in group participation rates brought about by economic, demographic and taste factors not explictly controlled for in the regression. The use of both T and T^2 allows for the possibility of a curvilinear trend. (5.19) is a simplifed version of (5.18) used by Barth (1970) and Gregory and Sheehan (1973). The final equation, (5.20) includes the variable $W/\bar{W}$. Wachter's (1972) analysis suggested that such a variable should be included to account for the permanent income effect and the relative income effect on labour supply. The permanent income effect argues that when W is high relative to $\bar{W}$ there will be a transistory effect on labour supply such that it will increase i.e. workers time their labour market activity to coincide with periods when the current wage is high relative to permanent income. The relative income hypothesis, on the other hand, argues that when W is high relative to $\bar{W}$ married women will not have to work in order to maintain their families standard of living and will therefore withdraw from the labour force.

In equations (5.15) - (5.17) the variable E^g/P^g is used as the proxy for labour demand. We would expect the coefficient on this variable to be positive in the presence of a discouraged worker effect.

6. Time-Series Tests of the Discouraged Worker Effect (Male)

Functional Form No.	Constant	E^m/P^m	$1 \times P^m$ x 100,000	T	log T	T^2	U^t/L^t	E^t_m/E^t	$W/\bar{W}$	$\bar{R}^2$	D.W.	D.O.F.
5.15	0.228 (3.950)	0.713 (8.911)	0.057 (0.891)							0.8736	1.276	19
5.16	0.287 (2.584)	0.651 (4.704)		−0.0004 (−0.870)						0.873	1.275	19
5.17	0.257 (2.849)	0.690 (6.249)			-0.0021 (0.748)					0.872	1.259	19
5.18	0.680 (10.541)			−0.0027 (−1.940)		0.000013 (0.173)	0.0063 (1.635)	0.473 (1.869)		0.784	1.393	17
5.19	0.808 (214.19)			−0.0027 (−5.757)			0.0041 (1.3194)			0.749	1.092	19
5.20	0.865 (5.075)						-0.0098 (-3.129)		-0.063 (-0.370)	0.316	0.658	19
5.20a	0.977 (9.751)			−0.0028 (−6.229)			0.0057 (1.839)		-0.168 (-1.687)	0.771	1.274	18

NOTE: Numbers in parentheses beneath coefficients refer to t values.

7. Time-Series Tests of the Discouraged Worker Effect (Females)

Functional Form No.	Constant	E^f/P^f	$1/P^f$	T	log T	T^2	U^t/L^t	E^t_m/E^t	$W/\bar{W}$	$\bar{R}^2$	D.W.	D.O.F.
5.15	-0.020 (0.637)	1.059 (14.744)	0.040 (0.373)							0.946	0.514	19
5.16	0.062 (0.685)	0.744 (2.011)		0.0018 (0.811)						0.947	0.390	19
5.17	-0.023 (0.808)	1.105 (8.762)			-0.339 (-0.562)					0.946	0.544	19
5.18	0.085 (1.497)		0.0018 (1.467)			0.00019 (2.803)	0.0070 (2.053)	0.636 (2.854)		0.974	1.321	17
5.19	0.239 (65.193)			0.0049 (10.728)			0.011 (3.764)			0.963	1.275	19
5.20	0.450 (1.716)						0.038 (7.869)		-0.199 (-0.762)	0.749	1.124	19
5.20a	0.257 (2.455)			0.0049 (10.270)			0.011 (3.537)		-0.018 (-0.172)	0.961	1.293	18

NOTE: Numbers in parentheses beneath coefficients refer to t values.

In equations (5.18) - (5.20) the proxy for labour demand is U^t/L^t. We would expect a negative sign on the coefficient of this variable in the presence of a discouraged worker effect. Bowen and Finegan (1969) and Barth (1970) utilized the total unemployment rate because they were concerned with evaluating the impact of a generally tight or loose labour market on various groups.

We fit the foregoing equations to annual New Zealand data for the period 1960-1981. The data used was drawn from Tables 4 and 5 and the results are reported in Tables 6 and 7. The results do not lead to either a clear acceptance or rejection of the discouraged worker hypothesis. Equations (5.15) - (5.17) produce a coefficient on E^g/P^g which is both of the correct sign and significantly different from zero. However, the large size of the E^g/P^g coefficient, in conjunction with a low intercept coefficient and coefficients for the remaining variables which are not significantly different from zero, suggests that L^g/P^g is virtually being regressed on itself. As we can see from Table 5, employment represents a large fraction of people in the work force and hence autonomous movements in L^g/P^g, those not caused by changes in labour demand, are almost certain to be accompanied by similar movements in E^g/P^g generating a spurious positive association between these two variables. Because a time-trend variable simply cannot control for short-period autonomous movements it cannot be used to eliminate the upward bias in the coefficients for E^g/P^g.

Equations (5.18) - (5.20) produce a coefficient of the expected sign for U^t/L^t only in the regression of (5.20) for males. However the introduction of T, equation 5.20a Table 6, reverses the sign on the U^t/L^t coefficient. Of the remaining tests, all of the U^t/L^t coefficients were positive and, in the case of females, significantly different from zero. One explanation for this is that it is evidence of a net "added" worker effect. However the coefficients on U^t/L^t are very small, while the value of the coefficient on the intercept, for both males and females is close to the mean for male and female participation over the period. This may indicate an essentially non-cyclical behaviour in participation. Our results may also derive from a misspecified relationship. Changes in participation may be the cause, rather than the result, of changes in the unemployment rate.

Rather than pursue the time-series tests for discouraged workers further we will turn our attention to cross-section data. The following equations are suggested as a test of the discouraged worker effect utilizing 1981 Census data for Employment Districts:

$$(L^g/P^g) = a + b\ (E^g/P^g) + c\ 1/P^t + dID \qquad (5.21)$$

$$(L^g/P^g) = a + b\ (U^t/L^t) + c\ 1/P^t + dID \qquad (5.22)$$

where

ID = North Island - South Island dummy taking the form of 1 for North Island locations and 0 for South Island locations.

8. Labour Force Data for Cross Section Analysis from the 1981 Census

Employment District	Population Male (000)	Population Female (000)	Labour Force Male (000)	Labour Force Female (000)	Unemployment Male (000)	Unemployment Female (000)	Employment Male (000)	Employment Female (000)
Whangarei	38.8	38.6	29.7	13.8	2.0	1.3	27.7	12.5
Auckland	206.6	222.9	157.4	94.6	7.4	5.1	150.0	89.5
Manakau	88.4	91.6	71.5	38.6	4.1	2.6	67.4	36.0
Hamilton	94.5	95.1	74.1	36.3	3.0	2.4	71.1	33.9
Tauranga	26.7	28.2	19.3	9.5	0.9	0.6	18.4	8.9
Rotorua	49.9	48.1	40.9	18.2	1.8	1.7	38.1	16.5
Gisborne	16.0	16.2	12.6	6.0	0.5	0.5	12.1	5.5
Napier	23.9	24.9	18.6	8.8	0.8	0.6	17.8	8.2
Hastings	23.3	24.8	18.4	9.3	0.6	0.5	17.8	8.8
New Plymouth	35.0	35.9	27.2	13.4	0.9	0.7	26.3	12.7
Wanganui	27.5	26.8	21.6	9.2	0.7	0.7	20.9	8.5
Palmerston North	50.6	53.4	37.2	20.2	1.3	0.9	35.9	19.3
Wellington	76.1	78.5	60.5	38.7	2.0	1.4	58.5	37.3
Lower Hutt	47.5	48.7	38.3	21.3	1.1	0.8	37.2	20.5
Masterton	15.8	15.9	12.7	5.9	0.4	0.3	12.3	5.6
Blenheim	12.8	12.7	9.7	4.1	0.3	0.3	9.4	3.8
Nelson	23.5	24.5	17.4	8.8	0.5	0.4	16.9	8.4
Greymouth	12.3	11.7	9.4	3.9	0.3	0.2	9.1	3.7
Christchurch	133.3	139.4	100.6	50.7	3.9	3.0	96.7	47.7
Timaru	21.4	22.0	16.5	6.4	0.4	0.4	16.1	6.0
Dunedin	65.3	68.0	48.7	24.0	1.2	0.9	47.5	23.1
Invercargill	39.1	37.6	32.4	13.7	0.4	0.5	32.0	13.2

Source: Department of Statistics (1981).

9. Cross Section Tests for the Discouraged Worker Effect

Functional Form No.	Constant	E^g/P^g	$1/P^g$ x 100,000	ID	U^t/L^t	$\bar{R}^2$	DOF
			Males				
5.21	1.448 (0.797)	0.719 (0.384)	0.0082 (0.413)	-0.014 (-0.263)		0.017[a]	18
5.22	0.719 8.223		0.0073 (0.374)	-0.017 (-0.320)	0.0095 (0.477)	0.021[a]	18
			Females				
5.21	-0.637 (-1.667)	1.060 (2.657)	-0.013 (2.075)	0.048 (3.230)		0.536	19
5.22	0.419 (14.747)		-0.017 (-2.743)	0.051 (2.897)	-0.121 (-1.881)	0.460	

[a] R^2 not $\bar{R}^2$

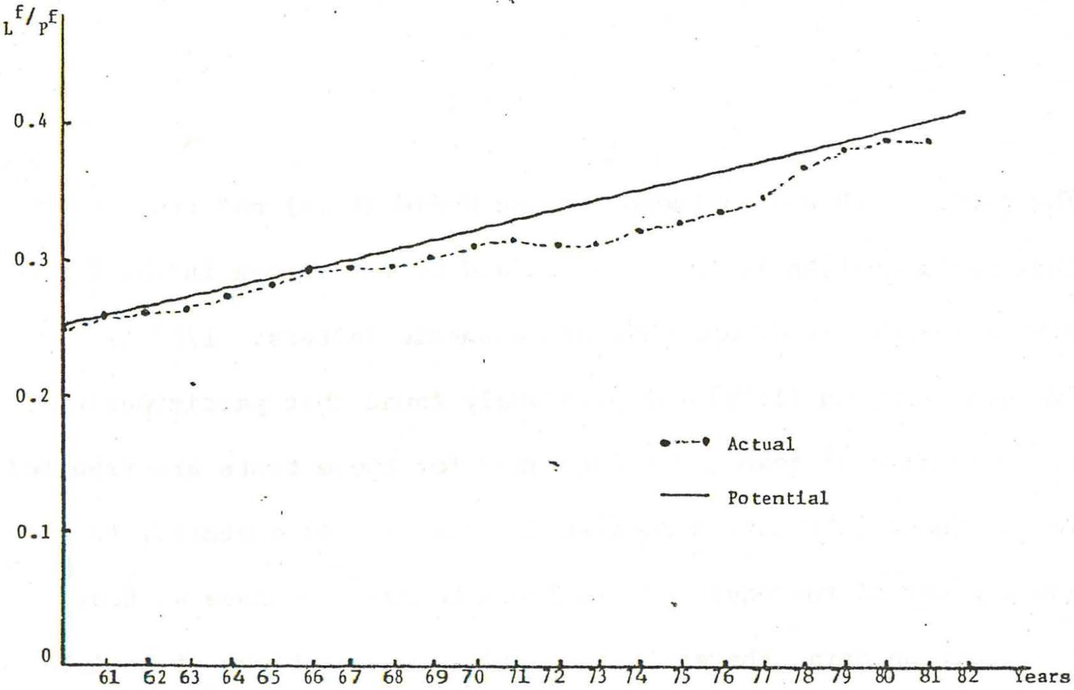
NOTE: Numbets in parentheses beneath coefficients refer to t values.

The variable ID was included because Neild (1971) had previously found that participation in the South Island is lower than in the North even after allowing for demographic and economic factors. $1/P^t$ is included because Hyman (1978) had previously found that participation increases with size of town. The data used for these tests are reported in Table 8. The results are presented in Table 9. As expected, the explanatory power of the equations is low. However, because we have used cross-section data, the analysis is free from problems of serial correlation. As a result, we can more readily make a judgement on the relevance of the discouraged worker hypothesis. For the male group our results provide no support at all for an inverse relationship between labour demand and labour force participation. For females, on the other hand, a discouraged worker effect does seem to be present although the evidence, especially from (5.22), is not conclusive.

5.6 Estimating the Number of Discouraged Workers

The computation of hidden unemployment from regression analysis involves a number of problems. The two most important being (a) a full employment level of unemployment must be chosen and (b) the coefficients for either L^g/P^g or U^t/L^t have very large confidence limits. The first problem involves an arbitrary choice. Depending on the full employment level of unemployment chosen, the estimates of hidden unemployment will vary accordingly. The second problem means that any estimates made will also have large confidence limits attached to them. This may make them useless for further analysis.

FIGURE D Female Participation Rates.



10. Estimated Female Discouraged Workers (March)

Year	Estimated No. of Discouraged Workers (000)	Census Equivalent Unemployed (000)	DW/UC^e	Potential Work force[a] (PWF) (000)	Potential Unemployment Rate $\frac{DW + UC^e}{PWF}$ %	Braae-Gallacher Potential Unemployment Rate
1960	0	2.0	-	214.0	0.93	1.87
1961	0	1.2	-	222.9	0.54	0.04
1962	4.3	2.1	2.05	233.9	2.74	2.29
1963	9.9	2.4	4.13	245.4	5.01	4.84
1964	6.4	2.5	2.56	256.8	3.47	4.54
1965	4.7	2.9	1.62	269.0	2.83	3.07
1966	0	2.8	-	280.0	1.00	0.32
1967	0	3.2	-	292.4	1.09	- 0.51
1968	9.8	7.1	1.38	302.6	5.58	5.21
1969	13.0	5.9	2.20	314.5	6.00	5.10
1970	19.3	4.4	4.39	334.8	7.08	3.65
1971	15.6	4.4	3.55	341.9	5.85	2.19
1972	26.6	7.0	3.80	358.5	9.37	4.60
1973	35.0	6.5	5.39	376.2	11.03	4.09
1974	32.5	4.6	7.07	393.9	9.42	0.93
1975	32.7	7.7	4.25	403.8	10.00	2.19
1976	31.7	10.8	2.94	412.4	10.31	3.28
1977	27.4	10.5	2.61	424.0	8.94	2.45
1978	9.2	17.7	0.52	436.6	6.16	4.92
1979	1.2	19.1	0.06	446.7	4.54	2.98
1980	2.3	20.4	0.11	457.4	4.96	3.40
1981	11.9	25.3	0.47	475.5	7.82	5.00

[a] Intercensal Labour Force (April, except 1980 and 1981 which are February) plus Hidden Unemployment due to measurement error, plus Discouraged Workers (March estimates)

Source: Table 1; Table 3; Table 5.

Fortunately, we are not restricted to using our regression results to estimate the number of hidden unemployed as an alternative procedure, introduced by Taylor (1970), exists. Taylor's procedure is as follows:

1. Examine the time series of participation and seek out the full employment levels of participation. At such peaks it is assumed that the labour force has reached its cyclical (short-run) maximum.

   The labour force is therefore assumed to be 100 percent of its true short-run value at such peaks.

2. Fit linear segments to the full employment levels of participation in order to generate a series of full employment participation rates for all non-peak quarters. (This has been done in Figure D for female participation rates in New Zealand).

3. The number of discouraged workers (DW) is then calculated from the ratio of actual participation to full employment participation.

$$DW_t = P\ [(L/P)^*_t - (L/P)_t] \tag{5.23}$$

where

L = recorded female labour-force,

P = female population of working age,

$(L/P)^*$ = full employment participation rate for females.

The results of this exercise, for New Zealand, are reported in Table 10. The table demonstrates the existence of a considerable number of discouraged workers amongst women over the period.

As Merrilees (1977) points out, this method has several advantages apart from ease of computation. Firstly, non-linearities can be allowed for. Secondly, the measure is direct, with no reliance on a causal specification such as unemployment linkage. Thirdly, the measure is malleable to structural changes in the labour market.

Unfortunately disadvantages do exist. For example, the method is mainly relevant when participation rates have an upward trend. This effectively excludes using the method to calculate discouraged workers amongst the male labour force in New Zealand. In this respect we are fortunate that our previous econometric analyses produced no evidence of a discouraged worker effect operating within this group. A further limitation results from the fact that the estimates of the full employment participation rate rely heavily upon the assumption that the chosen full employment peaks in participation are of equal strength. The fact that the peaks we have chosen, 1961 and 1966, correspond with the lowest levels of the total census equivalent unemployment rate (Table 4) over our period of study, suggests that this assumption of equal strength in each of the relevant peaks is not unreasonable. A final problem is that linear extrapolations at the beginning and at the end of the series makes those particular estimates of full employment participation hazardous. Unfortunately this problem is particularly severe in the New Zealand case. The existence of very low levels of unemployment in the 1960s means that peak periods of participation will be found in this period. Extrapolating far into the 1970s may not be justified, producing precarious estimates of discouraged workers.

Nevertheless the results reported in Table 10 are interesting. Up until 1970 our measure for the potential female unemployment rate moves in a manner (and at a magnitude) comparable with Braae and Gallacher's (1983) estimates. The assumption of near full employment for this period appears justified and the number of discouraged workers is relatively low. After 1970 the two estimates diverge greatly. Our potential unemployment rate values are heavily influenced by the very rapid increase in the number of discouraged workers during the onset of the recession. As predicted, Braae and Gallacher's method causes them to understate the number of hidden unemployed when their estimates are based on Census data collected during periods of high unemployment.

As we move beyond the mid-seventies, the confidence that can be placed in our estimates diminishes. However, the results we have obtained are not unreasonable. The two potential unemployment rates converge as a result of a noticeable drop in the level of our estimated number of discouraged workers. This phenomenon may result from the increasing importance of the added worker effect. In the early stages of a recession the number of married men dismissed tends to be absolutely very small, with unskilled, unmarried juniors and others ahead of them in the hierarchy of firing (Merrilees 1977). However, as the recession worsens, the number of unemployed married men becomes noticeable, with many wives forced into the work force in order to help the family survive a period of unemployment experienced by the husband. The addition of these women to the workforce counters the build-up of discouraged workers.

11. Unemployment and Discouraged Workers SIS data, 1980-81

Statistic	Male	Female
SIS Unemployment Rate[a] (%)	3.6	5.5
Census Equivalent Unemployment Rate for 1981 (%)	3.6	5.5
SIS Potential Unemployment Rate[b] (%)	5.1	11.3
Potential Unemployment Rate from Current Study for 1981 (%)	-	7.8
Braae-Gallacher Potential Unemployment Rate for 1981 (%)	4.9	5.0

[a] Respondents who describe themselves as seeking full-time work or who are not seeking full-time work because they are on temporary layoff from a job or would be starting a new job within the next four weeks were recorded as unemployed. The labour force figure consists of the foregoing (unemployed) persons plus the number of respondents who describe themselves as working 20 hours or more.

[b] If not employed respondents were not looking for a job because (a) they were of the opinion that employers think them too old or young; (b) they believed no suitable work was available; (c) they believed they lacked the necessary skills or training; then they were classified as discouraged workers. In calculating the SIS Potential Unemployment Rate this group is added to both the numbers unemployed and the work force.

Source: Unpublished data provided by Social Indicators Section, Department of Statistics; Table 1; Table 10.

The subsequent rise in our data (after 1979), may be explained by the workers who were added becoming discouraged when they find that they are unable to secure employment.

5.7 Evidence From a Survey of the Unemployed

During the period October 1980 to September 1981 the Department of Statistics conducted a special survey as part of a programme designed to develop "social indicators" for New Zealand. The survey, known as the Social Indicators Survey (SIS) was carried out with 6,891 respondents aged 15 or more. As a result of SIS a considerable amount of previously unavailable data on New Zealanders was collected. Of special interest to us, is the information collected on aspects of labour force participation and non-participation. Table 11 records, at the aggregate level, unemployment rates and potential unemployment rates calculated from SIS data. For comparison, we report the census equivalent unemployment rates for 1981, Braae and Gallacher's potential unemployment rates for 1981 and our own estimates of the potential unemployment rate for 1981. The results are encouraging. Our estimates for the census equivalent unemployment rate are identical to the SIS unemployment rates for both males and females. Although the SIS potential unemployment rate for females is higher than our estimate part of the difference may be explained by the fact that the SIS figure will include individuals who were discouraged in months after March 1981 and our estimates indicate that the number of discouraged workers was rising at this time. In any case, the SIS estimate of potential unemployment for females is considerably higher than the Braae-Gallacher estimate,

12. The Characteristics of Discouraged Workers

Characteristic	Proportion of Population 15 and more		Proportion of Discouraged Workers	
	Males (%)	Females (%)	Males (%)	Females (%)
No secondary school qualification	42.2	55.6	68.2	69.2
Married	66.0	66.0	37.6	54.4
Unskilled[a]	67.8	76.9	63.4	88.7
Proportion in Lowest Income Quartile	17.6	25.0	39.8	43.4
Under 24 years of age	25.3	23.8	41.9	16.9
Over 54 years of age	23.4	26.7	51.0	43.2

[a] Includes workers from the following occupational categories: Clerical, Sales, Service and Production etc.

Source: Unpublished data provided by Social Indicators Section, Department of Statistics.

supporting our earlier contention that the latter method will produce underestimates. While the male results would not lead to the same conclusion the importance of discouraged workers in this group is clearly much less - a fact which supports our decision not to attempt a calculation of male discouraged workers.

Further disaggregation of the SIS data maybe extremely hazardous. However, with this warning in mind, we compare, in Table 12, the characteristics of the discouraged group (for both males and females) with the characteristics of the population as a whole.

In Section 2.5 of Chapter 4 we predicted, on the basis of the search theory model, that discouraged workers would consist of " ... the young, elderly and unskilled". The SIS results largely support this prediction. Male discouraged workers are typically poorly educated, single and outside of the prime working age. Female discouaraged workers are also poorly educated and concentrated in the older age groups.

6. CONCLUSION

In this chapter we have observed that the development of an indicator of unemployment is a difficult task. The measure needs to be carefully defined and collection procedures must be instituted to ensure that what is measured is what was intended to be measured. This is difficult to do when information is collected on a survey or census basis and requires that the questions asked be framed in a manner that avoids distortions in the results due to the varied interpretation of questions by respondents. The task is practically impossible when the source of information is voluntary registration at employment offices.

Both the census method and the registration method for collecting unemployment data are suspect in the New Zealand case. The census method, because the questions soliciting information on unemployment status are open to wide interpretation, and the registration data because there is no adequate incentive to register.

Attempts to adjust the data have assumed either that the Census figures closely approximate the "true" situation or that there is a fixed ratio between registered unemployment and "true" unemployment. Although neither assumption is satisfactory we have, in making our estimates, opted for the first. Unfortunately, it is an assumption that cannot be tested with the data currently available. In this regard we add our voice to the call for a regular labour-force survey.

After constructing a measure for Census equivalent unemployment we employed it to test for the discouraged worker effect over time. The results were disappointing but, using cross-section data from the 1981 Census, we were able to establish the presence of a relationship between female labour-force participation and economic conditions. We then used our census equivalent labour force figures to produce estimates of the number of discouraged female workers for the period 1960 to 1981. Our estimates indicated that Braae and Gallacher (1983) had underestimated the number of hidden unemployed - a conclusion that was supported by the results of a 1980-81 survey carried out by the Department of Statistics. The SIS survey also enabled us to confirm that the characteristics of discouraged workers were in accordance with the prior predictions of theory.

Perhaps the greatest value of this chapter is the fact that it identifies the precarious nature of the data with which we will be working. It therefore serves as a warning to be careful in how we interpret the results of the research conducted in the following chapters.

NOTES

1. In particular our definition does not draw a distinction between voluntary and involuntary unemployment. Although these terms may have some special appeal in analysing the causes of unemployment it is questionable whether the distinction is useful from a measurement point of view (Hughes 1975b). Consequently our theoretical definition of unemployment encompasses both.

2. Although, as Endres (1980) has observed, counting procedures will necessarily take place at one remove from the theoretical concept so that the correspondence between the theoretical concept of unemployment and its operationally defined, empirical equivalent will remain proximate. Thus any statistic of unemployment can be no more than an indicator, or stand in, for the theoretical concept which it is used to express.

3. For a more detailed account see Levine (1950).

4. Endres (1980) has emphasised the need for a broad community consensus about the validity (meaning) of unemployment indicators.

5. Respondents may be reluctant to admit that they are not interested in paid employment or fearful of giving someone the impression that they are not willing to work. Alternatively, a housewife may interpret her intention to accept the "right" job if it comes along as looking for work.

6. See Braae (1983) for a discussion on the comparability of the 1976 and 1981 Census labour force definitions and Kay (1983) for a general discussion of the problems of comparability.

7. In fairness, it must be stated that this was not the purpose of these exercises. Braae and Gallacher (1983) merely wished to produce an estimate of potential unemployment and Walsh wanted to estimate an unemployment figure which "includes the hidden unemployed".

8. A steady state population is one in which births, deaths and migration patterns are such that the total population does not change <u>and</u> the age and sex distribution remains constant.

9. The second group will be comprised of those who are discouraged because of labour market reasons. These reasons may include discouragement because of the belief that a job cannot be found or discouragement because, even if a job was found, it would be at an unacceptably low wage. The latter cause of discouragement has been found to be empirically unimportant by Walsh (1978).

10. We have assumed that the number of discouraged workers existing at each Census date is the same. If this is not the case the problem inherent in calculating the level of potential unemployed at intercensal dates is exacerbated.

11. See for example Brosnan and Poot (1979), Poot and Brosnan (1980), Department of Labour (1979b) and Thompson and Endres (1979).

12. See Section 4.2 and Note 6.

13. See for example Poot and Brosnan (1980) and Braae and Gallacher (1983).

14. Such research must await the establishment of an adequate labour market survey. Such a survey has been called for by many researchers of which Poot and Brosnan (1980) and Braae and Gallacher (1983) are examples.

15. The registered unemployment rate is obtained by dividing the registered unemployed for each district, at the date nearest the Census date, by the district's Census labour force. Ideally our denominator should be made conceptionally equivalent to the intercensal labour force estimate. However, we do not have sufficient information to adjust the employment component and adjusting the unemployment component, by deducting the Census unemployment figure and adding the registration unemployment figure, may not improve the estimate at all. This is because some of the Census unemployed will actually be people on job creation schemes. Such people are included in the intercensal labour force but <u>not</u> as registered unemployed.

16. The emphasis in this section is on the <u>discouraged</u> worker effect. This is not to dismiss the possibility that an <u>added</u> worker effect may be present. Unfortunately, in New Zealand, there is no suitable data that enables us to test for the latter effect. Consequently our tests are more correctly tests of the <u>net</u> discouraged worker effect. All previous studies have found that when the added worker effect is present it is dominated by the discouraged worker effect.

CHAPTER 7

THE DURATION OF UNEMPLOYMENT IN NEW ZEALAND

1. INTRODUCTION

While the unemployment rate is used as a summary measure of labour market conditions it is an ambiguous indicator, being consistent with any number of distributions of unemployment and employment experience. For example, an unemployment rate of 8.3 percent would be consistent with a labour market in which each member of the work force is unemployed at random one month in twelve or with a labour market in which one person in twelve was continuously unemployed. We have previously seen that the decade of the seventies witnessed the development of search theory, a "new" view of the labour market which emphasises the voluntary nature of the movement of workers between jobs and unemployment. A familiar theme in this literature is that, if properly measured, the average duration of (completed spells of) unemployment is quite short. This emphasis on the voluntary search decisions of individuals has important theoretical as well as policy implications. On the theoretical level it tends to support the equilibrium view of labour markets and characterizes the unemployment experience as a transitory phenomenon. On the policy level the welfare significance of unemployment tends to be discounted, since the burden of unemployment is assumed to be widely shared among a large number of workers who stay unemployed for only a brief period. In this perspective, job availability - and unemployment relief - become less of a policy concern than measures to encourage job holding for longer periods do.

Thus, the length of time people spend on average looking for work may be viewed as an important index of labour market conditions. The labour market prospects of workers are best measured, not by the volume of unemployment of any age or sex group, but by that group's expected duration of unemployment on becoming unemployed. If a long spell of unemployment can be expected this would suggest considerable difficulties in finding jobs and indicate the need for job creation policies. On the other hand, if unemployment was concentrated in spells of short duration, this would be consistent with the search theoretic explanation of unemployment. In this chapter we examine the available data on unemployment duration in New Zealand. In Section 2 the simplest estimate of duration - average current duration or average interrupted duration (AID) - is considered. AID is a statistic based on the unemployment duration of those who are currently unemployed. In Section 3 the more relevant statistic of average completed duration (ACD) is examined. Unfortunately ACD is not directly observable from Department of Labour statistics and estimates are therefore generated. These estimates are compared with ACD data from the Department of Social Welfare whose superior quality data enable more accurate figures to be calculated for the average completed spell on unemployment benefit. In Section 4 a relatively new concept, experienced weighted duration (EWD), is analysed and estimates made. Section 5 considers the importance of multiple spells of unemployment and Section 6 concludes.

1. Average Interrupted Duration of Registered Unemployment Spells 1974-1983

Period	Average Interrupted Duration (Weeks)[a]	
	Male	Female
December 1974	5.5	6.2
December 1975	5.2	6.3
December 1976	7.2	7.3
December 1977	5.3	6.1
December 1978	11.2	11.6
November 1979	10.3	9.9
December 1980	10.9	9.8
December 1981	13.9	13.5
December 1982	12.3	12.1
June 1983	14.5	15.0

[a] Assumes that maximum duration is 52 weeks

Source: Department of Labour (various); Unpublished data from the Department of Labour.

2. THE AVERAGE LENGTH OF SPELLS IN PROGRESS

2.1 In Progress Spells of Registered Unemployed

No statistics on the average interrupted duration of registered unemployment (AIDRU) are published by the Department of Labour. However estimates of AIDRU can be readily calculated from Tables 9a-9c of Monthly Employment Operations for the period since March 1981 and for earlier periods from unpublished data available from the department on request. In essence, the tables record the number of persons registered as unemployed at the end of each month by the following duration categories: 0 to less than 4 weeks, 4 to less than 8 weeks, 8 to less than 13 weeks, 13 to less than 26 weeks, and 26 weeks and over. To calculate AIDRU we have assumed that there is a uniform distribution of tenures within each reported category and that no individual spell of unemployment exceeds 52 weeks.[1] The mid-point of each category is therefore assumed to be the mean spell for the group. These mid-points were taken to be 2, 6, 10.5, 19.5 and 39 weeks respectively. The number of persons in each class was multiplied by the class mid-point and the sum of the resulting products divided by the total number of unemployed persons to give our estimates of AIDRU which are reported in Tables 1 and 2.[2]

Table 1 shows how AIDRU, for both males and females, has risen since 1974. In each case there has been an increase over the period by a factor of approximately 2.5 This suggests that as the unemployment rate has risen the duration of unemployment has also moved up at a quite significant rate.

2. Average Interrupted Duration of Registered Unemployment Spells 1981 March - 1983 July

Group	Duration Category (Weeks) 0-<4	4-<8	8-<13	13-<26	26+	Total	Average Current Duration (Weeks)[a]
Total Male	10,095 (30.1)	6,935 (20.7)	5,065 (15.1)	6,185 (18.5)	5,232 (15.6)	33,513 (100.0)	13.1
Female	6,156 (29.0)	4,366 (20.5)	3,237 (15.2)	4,073 (19.2)	3,426 (16.1)	21,258 (100.0)	13.4
School Leavers Male	654 (34.9)	431 (23.0)	296 (15.8)	320 (17.1)	173 (9.2)	1,876 (100.0)	10.7
Female	817 (28.4)	602 (20.9)	464 (16.1)	593 (20.6)	399 (13.9)	2,875 (100.0)	11.1
15-24 Years Male	5,424 (33.5)	3,669 (22.7)	2,509 (15.5)	2,830 (17.5)	1,757 (10.9)	16,189 (100.0)	10.6
Female	3,852 (30.0)	2,722 (21.2)	2,008 (15.6)	2,461 (19.2)	1,800 (14.0)	12,843 (100.0)	12.7
25-39 Years Male	2,895 (27.6)	2,055 (19.6)	1,584 (15.1)	2,041 (19.5)	1,913 (18.2)	10,493 (100.0)	14.2
Female	1,076 (28.8)	741 (19.9)	532 (14.3)	662 (17.7)	721 (19.3)	3,732 (100.0)	14.3
40+ Years Male	1,079 (21.8)	816 (16.5)	676 (13.6)	995 (20.1)	1,388 (28.0)	4,954 (100.0)	17.7
Female	412 (22.4)	302 (16.4)	235 (12.8)	356 (19.3)	538 (29.2)	1,843 (100.0)	20.4

[a] Assumes that maximum duration is 52 weeks.
NOTE: Figures in parantheses are the percentage in category to the total in group.
Source: Department of Labour (various).

3. Average Interrupted Duration of Spells on Unemployment Benefit 1981 March - 1983 June

Group	Average Current Duration (Weeks)
Total Male	25.0
Female	25.5
16-24 Years Male	18.1
Female	21.3
25-39 Years Male	27.2
Female	31.8
40+ Years Male	42.4
Female	50.1

Source: Computed from the Department of Social Welfare data base.

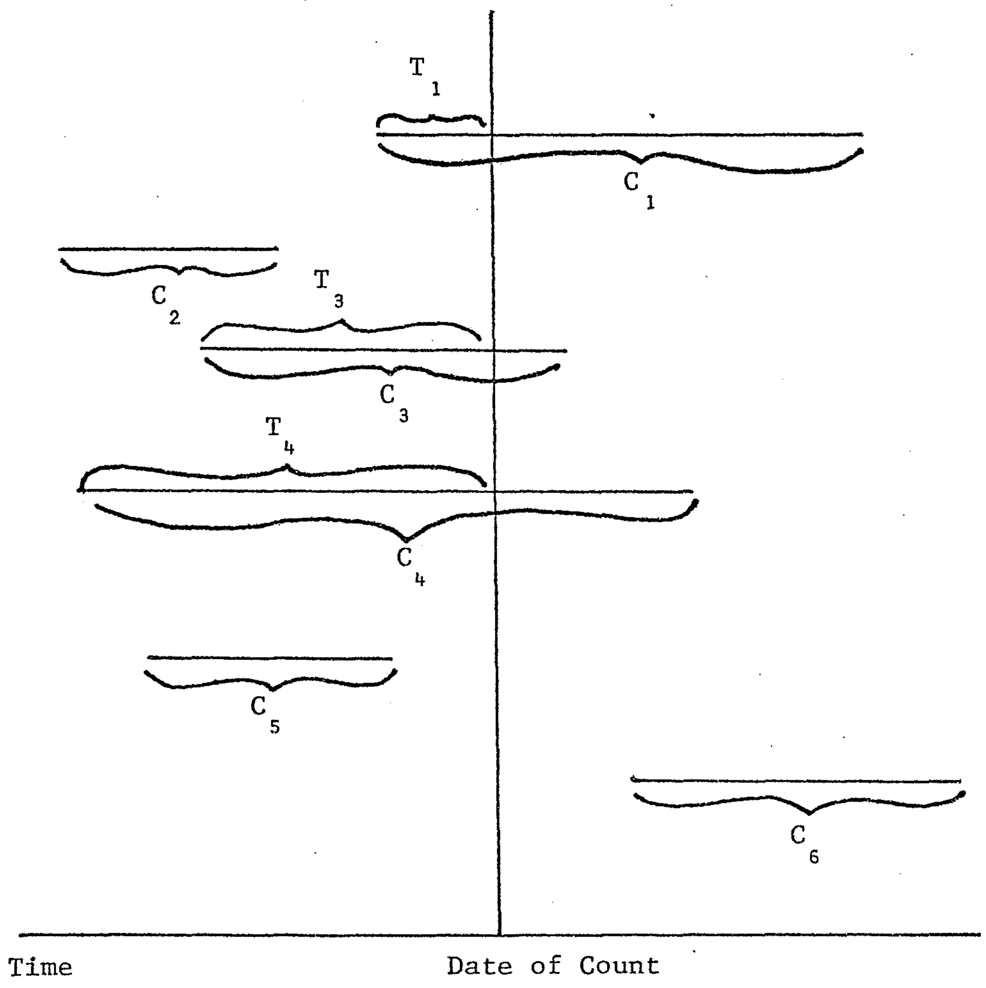
Table 2 presents data averaged over the period March 1981 to July 1983 for both sex and age groups. The data appears to support the usual proposition that school leavers and young workers will experience relatively less time in unemployment than the average and that older workers, who have the misfortune to become unemployed, will experience longer than average spells in unemployment. In addition, young women and older women appear to experience longer spells than do men in the same age groups.

2.2 In Progress Spells on Unemployment Benefit

An alternative source of information on the duration of unemployment is provided by the records of spells on benefit kept by the Department of Social Welfare. Table 3 presents estimates, derived from this source, of the average interrupted duration of spells on unemployment benefit (AIDBEN) averaged over the period March 1981 to June 1983. The pattern of the data is similar to that found with AIDRU data over the same period. That is, women tend to have longer spells than men and the young tend to have shorter spells than the elderly.[3]

However, one important difference between the AIDBEN figures and those for AIDRU stands out clearly. AIDBEN is nearly twice the length of AIDRU in all categories. That AIDBEN should be longer than AIDRU is not unexpected. Benefit recipients, although they may well become discouraged about their future job prospects, will not let their

FIGURE A: Comparison of AID and ACD



enrolment on the unemployment register lapse because of the incentive provided by continued receipt of the unemployment benefit. Non-recipients, on the other hand, will lack this monetary inducement to maintain their registration and allow it to lapse once they become sufficiently discouraged and form the opinion that registration is not likely to result in employment. What is surprising, however, is the size of the discrepancy between the two sets of figures. The size of the difference may be additional evidence in support of the hypothesis that registered unemployment data understates the true level of unemployment in New Zealand.

2.3 The Nature of AID Estimates

A clear distinction should be drawn between the duration variable AID, which we have used above, and the entirely different variable that job-search theorists are referring to. The latter variable is what we have termed average completed duration (ACD). The conceptual difference between AID and ACD has been highlighted by Salant (1977) and is illustrated in Figure A. Calander time is measured on the horizontal scale. Each horizontal line represents a spell of unemployment. The length of the line indicates the length of a completed spell (C). Six observations of completed spells are shown in the diagram. The Department of Labour, however, does not observe, and therefore cannot record, data on C. Instead, once a month, the department records the number of persons on the unemployment register and the length of spells in progress up to the date of the count. This variable is designated by T in Figure A. AID can now be clearly distinguished from ACD as reflected in the following equations.

$$AID = (T_1 + T_3 + T_4)/3 \qquad (2.1)$$

$$ACD = (C_1 + C_2 + C_3 + C_4 + C_5 + C_6)/6 \qquad (2.2)$$

Unfortunately AID does not even represent a good estimate of ACD. There are two reasons for this. The first is referred to as "interruption bias". The second results from the "length biased" sample used to construct AID.

Interruption bias occurs because spells of unemployment are "captured" by the Department of Labour when they are only part-way to their completion. This phenomenon is demonstrated in Figure A by the fact that only three spells happen to be in progress when the count is conducted and only part of their full length is observed. Since, under stable economic conditions the intersection of a spell with the count is equally likely to occur at any point on the length of the spell, captured spells are, on average, halfway through their full length at the time of a count. Thus, if it were not for the problem of length biased sampling, a doubling of AID would provide a sensible estimate (in the steady state) of ACD.

Length biased sampling arises because, as Figure A also suggests, it is spells with longer than average full lengths that are more likely to be in progress at the time of the Department of Labour's count. If for example, full spells of X and 2X weeks are equally likely to occur, the longer spells will be twice as likely to be in progress at the time of count, since the interval in which the longer spells might have commenced is twice as long. Salant (1977) has shown that as long as the variance of completed spell lengths is negligible (relative to the square of mean length) length-bias is unimportant. On the other hand, if the variance of full spell lengths is sufficiently large, the effect of length bias can predominate causing AID to be greater than ACD.[4]

Which of the two effects will dominate - length bias or interruption bais - depends on what is called the "escape rate" or the probability that a person's unemployment will end in "N" weeks provided that it has not ended before that time.[5] Three propositions can be identified:

1. If the probability of escape rises with time unemployed, AID < ACD.
2. If the probability of escape is constant AID = ACD.
3. If the probability of escape falls with time unemployed AID > ACD.[6]

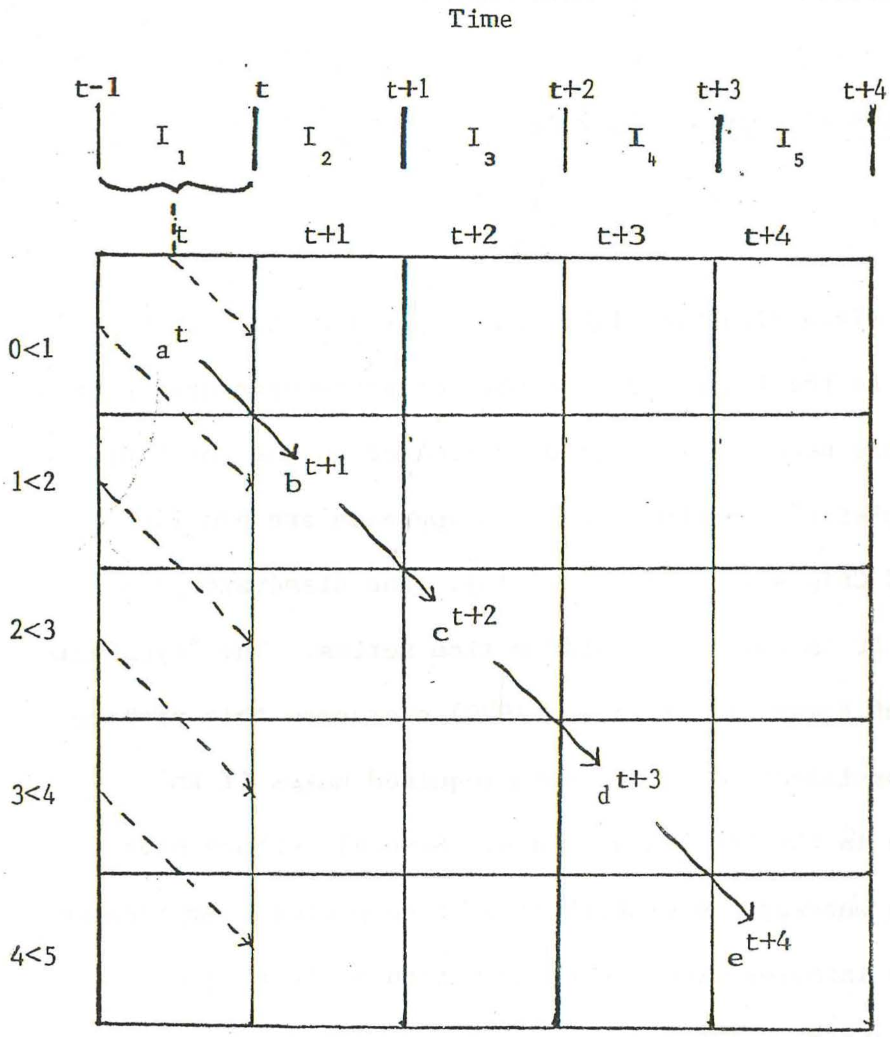
Over time, economic conditions are not stable, as has been assumed above, and changing economic conditions are likely to have an impact on the escape rate from unemployment for any given group. Thus, comparisons of AID for the group over time will be treacherous. In addition, escape rates will differ among demographic and occupational groups - and between regions. As a result, a group that appears on the basis of AID to be more hard-pressed than some other group may in fact have a shorter ACD. Thus, at any given point in time, a comparison of AID between groups is hazardous.

3. THE AVERAGE LENGTH OF COMPLETED SPELLS

3.1 Introduction

The foregoing discussion highlights the importance of obtaining estimates for ACD. In the literature a number of procedures have been developed to meet this need. Early research centred on the construction of a "stationary register". Examples of this approach are provided by Fowler (1968) and Cripps and Tarling (1974). The disadvantage of this method is that it is unable to yield a time series. The "synthetic register" approach of Bowers and Harkess (1979) overcomes this problem but the detailed classification of the data required makes it an unsuitable procedure in the New Zealand case. Several authors have developed techniques whereby the distribution of completed unemployment spell lengths may be inferred from the distribution of in-progress unemployment spell lengths using sophisticated econometric techniques. See for example, Salant (1977), Frank (1978), Lancaster (1979), Nickell (1979b) Lancaster and Nickell (1980) and Trivedi and Baker (1982). The lack of a suitable computer programme prohibited the adoption of such an approach in our study for New Zealand. A final, simpler technique

FIGURE B: Unemployment Flows



which we have adopted, is one which relies on knowledge of gross flow data of the unemployed. Examples of the use of this technique are found in Bowers and Harkess (1979). Gregory and Paterson (1980) and Hason and De Brouker (1982).

3.2. A Methodology for Estimating ACD from Gross Flow Data

In Section 2.1. we considered the nature of the duration data provided by the Department of Labour. This data is "snapshot" data on current duration, giving a breakdown of the stock of unemployment at a certain point in time into those who have been in the pool for different lengths of time. If we have regular snapshot observations on current duration with the width of the duration intervals equal to the length of the accounting period (the time between observations), and we know inflows each period, the completed duration experience of the unemployed can be estimated from the knowledge of escape rates that the data allows us to discern. The technique can be inferred from Figure B. The columns represent the points in time at which unemployment is observed. The rows 0<1 to 4<5 represent the duration intervals. The number in the (0<1,t) interval, a^t, is the number unemployed less than 1 time unit (e.g. a month or a quarter) at time t, the number in the (1<2, t+1) interval, b^{t+1}, is the number unemployed 1 to <2 time units at time t+1, etc. The block above the main grid represents inflows (I) each period. Thus the inflow over the period t-1 to t is related to the stock a^t at t.

By moving diagonally through the grid (as shown by the heavily marked arrows) we can determine how many individuals leave after different lengths of unemployment. Ignoring for the moment the inflow group, we can see that of the a^t individuals in the group (0<1, t) b^{t+1} remain one period later, and so on. Technically, the ratio b^{t+1}/a^t is the transition rate from the group (0<1, t) to the group (1<2, t+1) and the escape rate between the two groups is therefore $1-b^{t+1}/a^t$. Other transition and escape rates can be similarly calculated.

In our analysis we assume that the number of individuals in any group (e.g. a^t in (0<1, t)) are evenly distributed over the interval so that the current duration of the members of any group can be represented by the duration mid-point. For example, it is assumed that the number a^t have been unemployed, on average, for 0.5 of a time unit and that the number b^{t+1} have been unemployed for 1.5 time units. Thus the escape rate $1-b^{t+1}/a^t$ can be interpreted as the time period specific probability of an individual who has been unemployed for 0.5 time units at period t escaping from unemployment before period t+1. Alternatively the transition rate can be interpreted as the time specific probability of an individual who has been unemployed for 0.5 time units at period t remaining unemployed for a further full time unit.

We must now consider the transition and escape rate calculations for the inflow group. A person who has just become unemployed is regarded as an inflowing individual. To be consistent with our foregoing analysis we will want to derive a statistic that can be interpreted as either the time period specific probability of an individual who has just become unemployed leaving unemployment before the completion of a full time unit (the escape rate) or the time specific probability of an individual who has just become unemployed remaining unemployed for a full time unit (the transition rate). The ratio of a^t to I_1 does not provide this statistic. This is because the relevant current duration mid-point for the group a^t is 0.5 of a time unit not 1 time unit as is required. To approximate the required numerator we will average a^t and b^{t+1} so that the transition rate for the inflow group I_1 is $0.5\ (a^t + b^{t+1})/I_1$ and the escape rate is $1 - 0.5\ (a^t + b^{t+1})/I_1$.

Before we can proceed with the calculation of ACD a further adjustment must be made to the data. We currently have time unit specific transition and escape rates for individuals who have been unemployed for 0 time units, 0.5 time units, 1.5 time units etc. To be of use we have to adjust all rates so that we are considering a situation in which we have time unit specific transition and escape rates for individuals who have been unemployed for 0 time units, 1 time unit, 2 time units etc. This adjustment is made by estimating the required rates as a linear interpolation (or where necessary extrapolation) of the observed rates.

From the grid in Figure B we can calculate the following transition rates

$$\frac{0.5\ (a^{t} + b^{t+1})}{I}, \quad \frac{b^{t+1}}{a^{t}}, \quad \frac{c^{t+2}}{b^{t+1}}, \quad \frac{d^{t+3}}{c^{t+2}}$$

which correpond to the current duration mid-points 0, 0.5, 1.5, and 2.5. Our estimating procedure will require that the transition rates correspond to the current duration mid-points 0, 1, 2 and 3. The transition rate corresponding to the current duration mid-point 1 time unit, P_1 is given by the formula

$$P_1 = \left(\frac{b^{t+1}}{a^{t}} - \frac{c^{t+2}}{b^{t+1}} / 2\right) + \frac{c^{t+2}}{b^{t+1}} \qquad (3.1)$$

where $\frac{b^{t+1}}{a^{t}} > \frac{c^{t+2}}{b^{t+1}}$

The transition rate corresponding to the current duration mid-point 2 time units, P_2, is calculated in a similar manner while the transition rate corresponding to the current duration mid-point 3 time units, P_3, is given by the formula

$$P_3 = \frac{d^{t+3}}{c^{t+2}} - \left(\frac{c^{t+2}}{b^{t+1}} - \frac{d^{t+3}}{c^{t+2}} / 2\right) \qquad (3.2)$$

P_0 is, of course, the previously calculated transition rate for the inflowing group.[7]

The total unemployment experience of the t^{th} period inflow, in terms of the stated time units, can be approximated as

$$UE = I_t \cdot \frac{1 - P_{0t}}{2} + I_t \,.P_{0t} + I_t \,.P_{0t} \,.P_{1t+1} + I_t \,.P_{0t} \,.P_{1t+1}$$

$$.P_{2t+2} + I_t \,.P_{0t} \,.P_{1t+1} \,.P_{2t+2} \,.P_{3t+3} \cdot \frac{1}{1-P_{3t+3}} \tag{3.3}$$

The term $I_t \,.1 - P_{0t}$ is the number of persons experiencing less than one full time unit of unemployment. To account for their experience we assume that on average each experiences half a time unit of unemployment. Therefore $I_t \,.1 - P_{0t}$ is divided by 2 to give $I_t \,.1 - P_{0t}/2$, the first term of (3.3).

$I_t \,.P_{0t}$ is the number of persons experiencing more than one time unit of unemployment. $I_t \,.P_{0t} \,.P_{1t+1}$ is the number of persons experiencing more than two time units of unemployment and $I_t \,.P_{0t} \,.P_{1t+1} \,.P_{2t+2}$ is the number of persons experiencing more than three time units of unemployment.

The final term in (3.3), $I_t \,.P_{0t} \,.P_{1t+1} \,.P_{2t+2} \,.P_{3t+3} \,.1/1 - P_{3t+3}$ is dervied from assuming that for time intervals after t+3 the probability of leaving unemployment remains constant at P_{3t+3}.[8] It is equal to the number of persons experiencing more than four time units of unemployment ($I_t \cdot P_{0t} \cdot P_{1t+1} \cdot P_{2t+2} \cdot P_{3t+3}$) multipled by the expected duration of the remaining unemployment for this group ($1/1 - P_{3t+3}$).[9]

Grouping terms, (3.3) can be written as

$$UE = I_t \; (1 - P_{0t}/2 + P_{0t} + P_{0t} \cdot P_{1t+1} + P_{0t} \cdot P_{1t+1} \cdot P_{2t+2} + P_{0t} \cdot P_{1t+1} \cdot P_{2t+2} \cdot P_{3t+3} \; / \; 1 - P_{3t+3}) \tag{3.4}$$

or

$$UE = I_t \cdot ACD \tag{3.5}$$

where ACD is the completed actual average duration of unemployment in terms of the time units given.

As well as being the unemployment experience, in terms of the stated time units, for the t^{th} inflow group UE, under stable conditions in which the inflow doesn't change from period to period and in which the various transition rates remain constant, is a measure of the expected unemployment stock at any point in time.

FIGURE C: Computing Monthly Transition Rates from Department of Labour data.

Duration Group (Weeks)

Month	0<4	4<8	8<13	13<17	17<21	21<26	26+
1	a_1		c_1				
2		b_2	c_2				
3			c_3		D_4		
4				d_4	e_4	f_4	
5					e_5	f_5	
6						f_6	g_6
7							g_7

3.3 Estimates of ACD from Department of Labour Data

As we have seen, data from the Department of Labour is presented monthly in the following categories, 0<4 weeks, 4<8 weeks, 8<13 weeks, 13<26 weeks and 26+ weeks. In calculating ACD we will either have to amalgamate this data into 0<13 weeks, 13<26 weeks and 26+ weeks or divide the category 13<26 weeks into three groupings of one month. In the first procedure we lose valuable information, in the second much of the information we required has to be estimated and, as we will see, the construction of a time series is not possible.

Although both procedures clearly produce difficulties it was decided to attempt both and to compare the results. We commence by attempting to divide the group 13<26 into three groups (13<17 weeks, 17<21 weeks and 21<26 weeks), each of which approximates a monthly interval. Figure C represents the problem to be overcome. The transition rates $T_{0<4} = b_2/a_1$ and $T_{4<8} = c_3/b_2$ can be calculated easily enough. However the transition rates $T_{8<13} = d_4/c_3$, $T_{13<17} \doteq e_5/d_4$ and $T_{17<21} = f_6/e_5$ cannot be calculated directly because rather than separate figures for the d's, e's and f's the Department of Labour reports an amalgamation such as $D_4 = d_4 + e_4 + f_4$. However from the diagram we can see that D_4 is contributed to by c_1, c_2 and c_3. In general any D_t will be contributed to by the corresponding c_{t-1}, c_{t-2} and c_{t-3}. Thus given time series data we may estimate the average contribution made to D_t by each c value by fitting the equation

$$D_t = \alpha c_{t-1} + \beta c_{t-2} + \gamma c_{t-3} \qquad (3.6)$$

4. Estimation of Average Values for α, β and γ for the period 1981 March to 1983 July[a]

Group	Transition Rates α	β	γ	$\overline{R}^2$
Total Male	0.75486 (8.5837)	0.4018 (3.0242)	0.13734 (1.1505)	0.950
Female	0.68230 (5.4929)	0.34364 (2.1769)	0.28209 (1.9721)	0.925
School Leavers Male	0.44412 (4.5062)	0.3647 (2.7448)	0.35969 (3.6386)	0.913
Female	0.52519 (4.5976)	0.33295 (1.904)	0.4644 (4.0723)	0.903
15-24 Years Male	0.77072 (5.455)	0.31723 (1.8310)	0.12406 (0.85705)	0.941
Female	0.69407 (5.9734)	0.31708 (2.3614)	0.26796 (2.2782)	0.924
25-39 Years Male	0.85069 (8.2935)	0.38346 (2.6996)	0.13765 (1.3115)	0.958
Female	0.63330 (6.6358)	0.35242 (2.8205)	0.32158 (3.22)	0.954
40+ Years Male	1.0452 (9.9724)	0.31496 (2.1210)	0.17775 (1.6539)	0.946
Female	0.66720 (3.7841)	0.32482 (1.5743)	0.60962 (3.3197)	0.927

[a] Estimated from equation 3.6

NOTE: Numbers in parantheses beneath coefficients are t values. Degrees of freedom equal 23 and $\overline{R}^2$ has been adjusted for degrees of freedom.

Source: Computed from data in Department of Labour (various).

The value of the coefficient α will represent an estimate of the average value over the period of the transition rate from the 8<13 group. We will call this $T^{av}_{8<13}$. In addition knowledge of β and $\hat{\gamma}$ will enable us to calculate $T^{av}_{13<17}$ and $T^{av}_{17<21}$, the average transition rates for the groups 13<17 and 17<21 respectively, over the period.

If we assume that the transition rate is roughly constant for durations more than six months $T_{21<26}$, from Figure C, could be calculated according to the formula provided by Cripps and Tarling (1974) of

$$T_{21<26} = {}^{g_7}/f_6 + g_6 \tag{3.7}$$

We do not know individual f values but we can calculate the average value of f over the period from knowledge of the average value of the c's and γ. We can also compute the average value of the g's. Therefore we will define

$$T^{av}_{21<26} = {}^{gav}/fav + gav \tag{3.8}$$

where $T^{av}_{21<26}$ is the average transition rate over the period from the group 21<26.

Table 4 reports the values for α, β and γ for ten demographic groups based on data from 1981 March to 1983 July. Table 5 reports, for the same demographic groups, the estimated average transition and

5. Estimated Average Transition and Escape Rates for the Period 1981 March to 1983 July

Transition Rates

Duration Class	Total Male	Total Female	School Leavers Male	School Leavers Female	15-24 Years Male	15-24 Years Female	25-39 Years Male	25-39 Years Female	40+ Years Male	40+ Years Female
0< 4[a]	0.687	0.704	0.639	0.717	0.673	0.701	0.715	0.688	0.771	0.733
4< 8[a]	0.743	0.741	0.702	0.794	0.698	0.774	0.792	0.724	0.854	0.794
8<13[b]	0.755	0.682	0.444	0.525	0.771	0.694	0.851	0.633	0.941	0.667
13<17[b]	0.536	0.504	0.820	0.941[c]	0.317	0.457	0.451	0.556	0.333	0.956[c]
17<21[b]	0.342	0.820	0.990	0.941[c]	0.485	0.845	0.358	0.914	0.564	0.956[c]
21<26[b]	0.883	0.800	0.618	0.650	0.850	0.770	0.900	0.810	0.920	0.790

Escape Rates

Duration Class	Total Male	Total Female	School Leavers Male	School Leavers Female	15-24 Years Male	15-24 Years Female	25-39 Years Male	25-39 Years Female	40+ Years Male	40+ Years Female
0< 4[a]	0.313	0.296	0.361	0.283	0.327	0.299	0.285	0.312	0.229	0.267
4< 8[a]	0.257	0.253	0.298	0.206	0.302	0.257	0.208	0.276	0.146	0.206
8<13[b]	0.245	0.318	0.556	0.475	0.229	0.306	0.149	0.367	0.059	0.333
13<17[b]	0.468	0.496	0.180	0.059[c]	0.683	0.543	0.549	0.444	0.667	0.044[c]
17<21[b]	0.658	0.180	0.010	0.059[c]	0.515	0.155	0.642	0.086	0.436	0.044[c]
21<26[b]	0.117	0.200	0.382	0.350	0.150	0.230	0.100	0.190	0.080	0.210

[a] Calculated directly from data on duration

[b] Calculated from data on duration and estimated values for α, β and γ from Table 4.

[c] β coefficient in Table 4 not significantly different from zero therefore estimates made utilizing only α and γ.

Source: Computed from data in Department of Labour, (various).

and escape rate for the duration classes 0<4 through to 21<26 for the period. The results are only partially what one would expect on an *a priori* basis. Most studies that have reported transition (escape) rates have found that they increase (decrease) from one duration class to the next.[10] This is true only over some of the classes for the groups we have studied. Generally our results indicate a rise (decline) in transition (escape) rates for the first few categories which is then followed by a sharp reversal.

Some attempt at explaining the foregoing observations is required before we proceed. A person leaving unemployment can do so in one of two ways: (a) find employment; or (b) withdraw from the labour force. Salant (1977) has argued that as time passes a sorting process takes place so that as individuals pass through unemployment, the people with relatively high escape rates will tend to leave more quickly until eventually only the sluggish members of the original cohort remain. Hence, although each individual person may have a constant escape rate, the tendency of the higher escape rate people to "sort" themselves out sooner makes the average rate for the group decline. Empirical work done by others tends to support this proposition. Thus we consider it unlikely that the rise in the escape rate that occurs after about two months unemployment results from individuals finding themselves jobs. This leaves us with only two possibilities. Either they are given a "special work scheme" job by the Department of Labour or they allow their enrolment to lapse because they have become discouraged

6. Estimated Monthly Transition and Escape Rates for Spells of Given Monthly Duration (Registered Unemployed)

Transition Rates

Duration Spell (Months)	Total Male	Total Female	School Leavers Male	School Leavers Female	15-24 Years Male	15-24 Years Female	25-39 Years Male	25-39 Years Female	40+ Years Male	40+ Years Female
0	0.559	0.572	0.495[a]	0.604[a]	0.542[a]	0.580[a]	0.601[a]	0.563[a]	0.679[a]	0.626[a]
1	0.715	0.773	0.670	0.755	0.685	0.722	0.753	0.706	0.812	0.761
2	0.749	0.714	0.573	0.659	0.734	0.718	0.821	0.678	0.897	0.730
3	0.643	0.593	0.632	0.733	0.544	0.575	0.651	0.594	0.637	0.811
4	0.437	0.662	0.905	0.941	0.401	0.651	0.404	0.735	0.448	0.956
5	0.660	0.731	0.761	0.780	0.625	0.710	0.652	0.772	0.684	0.873
6	0.883	0.800	0.618	0.650	0.850	0.770	0.900	0.810	0.920	0.790

Escape Rates

Duration Spell (Months)	Total Male	Total Female	School Leavers Male	School Leavers Female	15-24 Years Male	15-24 Years Female	25-39 Years Male	25-39 Years Female	40+ Years Male	40+ Years Female
0	0.441	0.428	0.505[a]	0.396[a]	0.458[a]	0.420[a]	0.399[a]	0.437[a]	0.321[a]	0.374[a]
1	0.285	0.275	0.330	0.245	0.315	0.278	0.247	0.294	0.188	0.239
2	0.251	0.286	0.427	0.341	0.266	0.282	0.179	0.322	0.103	0.270
3	0.357	0.407	0.368	0.267	0.456	0.425	0.349	0.406	0.363	0.189
4	0.563	0.338	0.095	0.059	0.599	0.349	0.596	0.265	0.552	0.044
5	0.340	0.269	0.239	0.205	0.375	0.290	0.348	0.228	0.316	0.127
6	0.117	0.200	0.382	0.350	0.150	0.230	0.100	0.190	0.080	0.210

[a] Assumes that the escape rate for new entrants is 1.4 times the escape rate for those who have been unemployed for two weeks.

Source: Computed from Table 5 and data in Department of Labour, (various).

about their prospects of securing work. On average over the period 6,367 persons were placed in jobs (including special work schemes) by the Department of Labour each month. Monthly enrolments for unemployment over the period averaged 24,062. To maintain the monthly average unemployment of 53,894 something like 17,695 persons must have either obtained jobs for themselves or have quit the work force. Even if we assume that individuals are twice as effective in obtaining new jobs for themselves than the Department of Labour this would still leave nearly 5,000 people on average per month over the period withdrawing from the work force. We therefore tentatively conclude that the observed rise in the escape rate after approximately two months on the register is due largely to labour force withdrawal.

Table 6 reports the escape and transition rates adjusted to coincide with monthly time periods and the escape and transition rates for those who have just become unemployed. Because no inflow figures are reported for any group other than total male and female we must infer the inflow escape rate for the other groups. To do this we assume that the ratio of the inflow escape rate to the escape rate from the group 0<4 is the same for all groups. Since for total males and females this ratio is approximately 1.4 we use this factor to obtain the inflow escape rate for the other groups. The data in Table 6 is used to make our estimates of the average completed duration for the various groups. These results are reported in Table 7.

7. Estimated Average Completed Duration of Unemployment for Specified Groups Over the Period 1981 March to 1983 July

Group	ACD (Weeks)
Total	
Male	9.6
Female	9.9
School Leavers	
Male	7.4
Female	10.5
15-24 Years	
Male	8.1
Female	9.2
25-39 Years	
Male	11.2
Female	9.5
40+ Years	
Male	15.3
Female	14.3

Source: Computed from data in Table 6 using equation 3.5.

In general ACD is higher for women than it is for men with the exception of the 25-39 age group. When compared with the AID figures of Table 2 it appears that interruption bias has not been as important as length bias in the computation of the AID figures as, in each case, ACD is less than AID for the corresponding group. In other words, we may conclude that, for the period over which our analysis was made, AID significantly overstates the duration of completed spells of unemployment and that length bias dominates the interruption bias (see Section 2.3).

An important conclusion that may be drawn is that completed spells of unemployment are generally only of moderate length. This finding is somewhat surprising given the fact that New Zealand was in the midst of a severe recession at this time. However, a similar analysis performed on data for the period 1975 June to 1977 June indicates that ACD was only 4.3 weeks for males and 4.4 weeks for females.[11] Thus, as the recession has worsened, it appears that ACD has risen.

Search theorists might accept the brevity of completed spells as evidence in support of their hypothesis and argue that almost everyone out of work can find his usual type of job in a relatively short time and that therefore the key to lowering the unemployment rate is to reduce the frequency of unemployment spells. However, it can be argued that the estimates of ACD alone are misleading indicators of the experience of persons moving through the unemployed state and that therefore search theorists may be wrong to draw comfort from evidence

8. Estimated Average Monthly Flow on to the Unemployment Register by Selected Population Sub-groups for the Period 1981 March to 1983 July[a]

Group	Estimated Average On-flow	Unemployment	On-flow as a Percent of Unemployment
Male School Leavers	1,097	1,876	58.5
Female School Leavers	1,174	2,875	40.8
Males 15-24	8,388	16,189	51.8
Females 15-24	5,667	12,843	44.1
Males 25-39	4,118	10,493	39.2
Females 25-39	1,635	3,698	44.2
Males 40+	1,395	4,954	28.2
Females 40+	570	1,843	30.9
Estimated Total Male	14,998	33,513	44.8
Estimated Total Female	9,046	21,258	42.6
Actual Total Male	15,235	33,513	45.5
Actual Total Female	9,174	21,258	43.2

[a] Computed from the formula $E_{\bar{x}} = UD_{\bar{x}}^{0<8}/1 - e_{\bar{x}}^{0}$

where $E_{\bar{x}}$ is the average monthly flow onto the register, $UD_{\bar{x}}^{0<8}$ is the average number in the duration category 0<8. and $e_{\bar{x}}^{0}$ is the average monthly escape rate for inflowing individuals.

Source: Computed from data in Table 6 and from data in Department of Lavour, (various).

9. Contribution of Spells of Specified Duration to Total Spells and to Total Unemployment: Average 1981 March to 1983 July

	Total			School Leavers		15-24		25-39		40+	
	Male	Female	Total	Male	Female	Male	Female	Male	Female	Male	Female
Completed Spells of Unemployment											
1. Proportion of Spells ending within 1 month	44.1	42.8	43.6	50.5	39.6	45.8	42.0	39.9	43.7	32.1	37.4
2. Proportion of Spells exceeding 3 months	30.0	31.6	30.6	19.0	30.1	27.3	30.0	37.2	26.9	49.5	34.7
3. Proportion of Spells exceeding 6 months	5.1	9.1	6.9	8.3	16.2	4.0	8.0	6.4	9.0	9.7	23.5
Proportion of Unemployment by Spell Length											
4. Less than 1 month	10.1	9.2	9.7	14.8	8.1	11.9	9.3	7.9	9.6	4.5	5.8
5. More than 3 months	47.8	46.7	47.4	37.2	48.6	38.3	41.3	52.8	45.4	60.8	62.5
6. More than 6 months	21.6	19.7	20.8	12.7	18.9	13.4	15.4	24.9	21.3	34.1	34.7

Source: Computed from data in Tables 6 and 8.

indicating a low ACD of unemployment. As Hason and De Broucker (1982) point out, the average duration of unemployment spells does not tell us much about the distribution of spell lengths and therefore about the importance of long spells or about the burden of unemployment. In addition, the brevity of average spells does not mean that locating a job, in general, is easy. Withdrawals from the labour force after an unsuccessful job search may also contribute to this result.

3.4 The Concentration of Unemployment

One way of assessing the importance of long spells of unemployment is to see what contribution they make to total unemployment. Knowledge of the transition rates for our demographic groups plus estimates for the average monthly flow into unemployment for each group (Table 8) enables the construction of Table 9.

From row 1 of Table 9 we can see the proportion of unemployment spells that ended within one month for each group. Even for males over 40 the group with the highest ACD, 32.1 percent of spells ended within a month. Clearly a large proportion of all unemployment spells end within one month. For the population as a whole about 43.6 percent of spells, on average, were completed within a month. However, while most spells are short, it does not mean that most unemployment is due to short spells or that most unemployed persons will leave unemployment soon. These points can be illustrated by reference to the proportion of unemployment that is due to spells of different length. For example row 6 records the proportion of unemployment accounted for by spells exceeding six months. In each case the contribution to unemployment of spells exceeding six months is greater than the contribution to unemployment of spells ending within one month (row 4). For the total population,spells of unemployment that last for longer than six months account for nearly 21 percent of unemployment but only 6.9 percent of spells. From row 5 we can see that for male school leavers, the group with the shortest ACD, over 37 percent of unemployment is due to spells lasting longer than three months. For males over 40 spells exceeding three months account for nearly 61 percent of the groups unemployment. For the population as a whole, spells exceeding three months contribute nearly 50 percent of all unemployment.

The conclusion appears inescapable, while a majority of spells are of short duration, a disproportionately large portion of total unemployment is explained by the long spells. Thus the evidence from ACD is not as supportive to the search theorist's case as first appeared. Although ACD for all groups, with the exception of those over 40, is only moderate and nearly 44 percent of all spells end within one month, the elimination of these short spells would reduce unemployment by only 10 percent. On the other hand the elimination of long spells, those in excess of six months, while reducing the number of spells by only 7 percent, would reduce unemployment by 21 percent.

The concentration of unemployment in long spells noted above indicates that over the period examined difficulty has been experienced in obtaining a job and highlights the need for job creation. However, several factors suggest that the observed concentration may even understate these difficulties. One of these we have previously touched upon but are not yet in a position to develop the argument further. That is, the fact that a large proportion of unemployment spells may be terminating in labour force withdrawal (discouraged workers) rather than employment. Another factor is the possibility of individuals having multiple spells of unemployment with only brief intervening periods of employment. Although no New Zealand evidence is available we will discuss this aspect in greater detail in Section 5.

3.5 An ACD Time Series from Department of Labour Data

As was pointed out in Section 3.3, one of the disadvantages of the technique used above is that it cannot produce time series data. We now turn to the alternate procedure which requires the amalgamation of the monthly data into quarterly data. The inflow data for a quarter is given by the sum of the inflow data for each month of that quarter. For example the inflow figure for the June quarter of 1981 for total males was 37,775 and was comprised of the monthly inflows of 13,812 (April); 11,915 (May) and 12,048 (June).

10. Expected Average Completed Duration

Time	Expected Average Completed Duration (Weeks)	
	Male	Female
1981 June	12.2	12.1
September	10.7	13.9
December	12.0	12.7
1982 March	10.1	10.6
June	11.1	11.3
September	12.0	12.1
December	12.9	13.1
1983 March	13.2	12.5
Average	11.8	12.3

Source: Computed from data provided in Department of Labour, (various).

The numbers in the duration categories are as at the end of each quarter. The only adjustment required being the addition of groups 0<4 weeks, 4<8 weeks and 8<13 weeks to give one category 0<13 weeks. The remaining categories 13<26 weeks and 26+ weeks remain unaltered.

One difference in operational procedure to that described in Section 3.2 should be noted. We, in fact, will be calculating the expected ACD of unemployment upon entry into the pool rather than actual ACD. This is derived from the transition rates calculated for two consecutive periods rather than from transition rates down the diagonal. Thus in terms of Figure B, the original transition rates are calculated from the dotted arrows between t-1 and t. If the labour market conditions generating these current transition rates were not to change the expected ACD and the actual ACD would be the same.

The results of this exercise are reported in Table 10. Again, because of the nature of the data required to make the computations, we are restricted in our study to the period after March 1981, the date from which inflow data became available. In addition we are only able to consider the construction of a time series for the total male and total female groups as breakdowns with respect to inflows are not provided for the remaining groups.

As can be seen from the table these estimates of ACD produce higher averages for both groups over the period than did the previous

11. Average Completed Duration of Spells on Unemployment Benefit for Specified Groups Over the Period 1981 I to 1983 II

Group		ACD (Weeks)
Total	Male	15.6
	Female	17.0
16-24	Male	13.6
	Female	16.1
25-39	Male	17.0
	Female	18.7
40+	Male	23.1
	Female	28.0

Source: Computed from the Department of Social Welfare data base.

method (11.8 weeks for males compared with 9.6 weeks and 12.3 weeks for females compared with 9.9 weeks). Considering the degree of aggregation on which the quarterly estimate is based this difference is not extraordinary and should not prohibit the future use of the time series based on the quarterly method of computation. Both estimates are below the estimates for AID provided in Table 2 giving further support to the belief that length bias sampling has a greater impact on the construction of AID than does interruption bias. Unfortunately insufficient observations can be generated with which to undertake a more detailed analysis.

3.6 Department of Social Welfare Data and ACD Estimates

We return now to Department of Social Welfare data to see if estimates of ACD from this source can add to our understanding of the recent history of unemployment in New Zealand. Because detailed data on benefit payments is kept by the Department of Social Welfare, techniques for estimating ACD are not required. The exact values can be calculated directly from the data files of the department. Table 11 presents the average value for ACD on benefit for each group for the period 1981 I to 1983 II.

As with the AID estimates from the two different sources, discussed in sections 2.1 and 2.2, our average completed duration on unemployment benefits (ACDBEN) is nearly twice the length of average

12. Proportion of Ceased Spells on Benefit of a Specific Length to Total Ceased Spells on Benefit: Various Groups: Average 1981 I to 1983 II.

Group	Total Number of Ceased Spells	Months						
		<1	1<2	2<3	3<4	4<5	5<6	6+
Total Male	19,593	28.3	20.0	13.4	11.6	6.3	4.4	16.1
		(5545)	(3919)	(2626)	(2273)	(1234)	(862)	(3155)
Female	10,961	25.5	19.7	13.5	11.5	6.2	4.9	18.7
		(2795)	(2159)	(1480)	(1261)	(680)	(537)	(2050)
16-24 Male	11,623	29.9	21.3	13.9	11.5	6.0	4.3	13.1
		(3475)	(2476)	(1616)	(1337)	(697)	(500)	(1523)
Female	8,927	25.8	20.1	13.7	11.8	6.3	4.9	17.4
		(2303)	(1794)	(1223)	(1053)	(562)	(437)	(1553)
25-39 Male	5,798	26.8	18.8	12.8	11.8	6.6	4.7	18.6
		(1554)	(1090)	(742)	(684)	(383)	(273)	(1078)
Female	1,496	25.1	19.0	13.2	10.6	6.0	4.8	21.4
		(376)	(284)	(198)	(159)	(90)	(72)	(320)
40+ Male	2,172	23.4	16.0	12.2	11.4	6.9	4.6	25.5
		(508)	(348)	(265)	(248)	(150)	(100)	(554)
Female	536	20.5	15.3	10.8	10.1	5.5	5.1	32.8
		(110)	(82)	(58)	(54)	(30)	(27)	(176)

NOTE: Figures in parantheses refer to the number in the group on average over the period.
Source: Data provided by the Department of Social Welfare.

13. Average Number of Spells Commencing: Quarterly Average 1981 I to 1983 II

Group	Average Number of Unemployment Benefits Granted per Quarter
Total Male	20,476
Female	11,222
16-24 Male	12,293
Female	9.193
25-39 Male	6,034
Female	1.501
40+ Male	2,148
Female	529

Source: Data provided by the Department of Social Welfare.

completed duration of registered unemployed (ACDRU). Again the explanation most probably lies with the incentive offered by the receipt of benefit to maintain one's registration.

The data from the Department of Social Welfare are presented in a manner which enables the proportion of ceased spells of a specified length to total ceased spells to be calculated for each quarter. In order to maintain consistency with the registration data of the Department of Labour we have used intervals of one month and averaged the data over the ten quarters from 31 March 1981 to 30 June 1983 in producing Table 12. Also shown in Table 12 is the average number of total ceased benefits per quarter and the average number in each of the spell length categories.

Table 13 presents the average number of spells on benefit that commenced per quarter over the period under consideration. As we would expect, the difference between the figures recorded in Table 13 and those in the second column of Table 12 are quite small.

Utilizing the data in Tables 12 and 13 we are able to estimate: (a) the proportion of spells on benefit that end within a specified period; (b) the contribution to the average stock of benefit recipients of spells of a given length (the stock of benefit recipients is analogous to the number unemployed); and (c) transition and escape rates for the various groups. In order to explain these calculations we will use the total male group as an example.

14. Average Stock of Unemployment Benefit Recipients 1981 I to 1983 II

Group		Stock of Recipients
Total	Male	23,732
	Female	13,996
16-24	Male	12,257
	Female	10,626
25-39	Male	7,624
	Female	2,108
40+	Male	3,852
	Female	1,262

Source: Calculated from data provided by the Department of Social Welfare.

The proportion of spells of a given length is simply the number of spells of that length for each group (from Table 12) divided by the number of benefits granted for the group. Thus we have 5545 ÷ 20476 = 27.1, the proportion of spells commenced that end within one month for all males.

In calculating the contribution of spells of a given length to the benefit recipient stock we first divide the number of spells ending within a specified period, for each group, by three. This is because we are interested in monthly divisions but have quarterly data. In dividing by three we are assuming that, for example, the 5545 spells for males that concluded within one month on average each quarter, did so at an even rate over the quarter. Similarly we assume that benefits are granted at an even rate over the quarter so that, on average, 6825 males commenced receipt of benefit each month. The contribution of spells less than one month will be equal to the number of spells that end within one month. For males this is 5545 ÷ 3 = 1848 or 7.8 percent of the stock of male benefit recipients on average over the period. (The average number of all stocks of benefit recipients over the period is shown in Table 14). The contribution of spells that cease between one month and less than two months is equal to the number of spells that end within this period multiplied by two. We multiply by two because on average the stock for any month will include new entrants who will eventually move into this category and entrants from the

15. Estimated Transition and Escape Rates (Monthly) for Unemployment Benefit Recipients

Duration Spell (Months)	Total		16-24		25-39		40+	
	Male	Female	Male	Female	Male	Female	Male	Female
	Transition Rates							
0	0.729	0.751	0.717	0.749	0.742	0.750	0.764	0.792
1	0.738	0.744	0.719	0.740	0.757	0.748	0.788	0.804
2	0.762	0.764	0.745	0.760	0.781	0.765	0.795	0.828
3	0.729	0.737	0.717	0.728	0.742	0.743	0.759	0.807
4	0.798	0.807	0.794	0.801	0.805	0.814	0.807	0.867
5	0.823	0.811	0.814	0.806	0.827	0.817	0.841	0.862
	Escape Rates							
0	0.271	0.249	0.283	0.251	0.258	0.251	0.236	0.208
1	0.262	0.256	0.281	0.260	0.243	0.252	0.212	0.196
2	0.239	0.236	0.255	0.240	0.219	0.235	0.205	0.172
3	0.271	0.263	0.283	0.272	0.258	0.247	0.241	0.194
4	0.202	0.193	0.206	0.199	0.195	0.186	0.193	0.133
5	0.177	0.189	0.186	0.194	0.173	0.183	0.159	0.139

Source: Calculated from data provided by the Department of Social Welfare.

previous month who will also become part of this category. Thus for males the contribution of spells between one month and less than two is 2 (3919/3) = 2612 or 11.0 percent of the stock of benefit recipients. The contribution of the remaining categories are computed in a similar fashion.

The escape rates and transition rates are computed from knowledge of the monthly flow onto benefit and the number ceasing benefit within a specific period. Thus for males 20,476 commenced benefit on average. 5545 of these ceased within one month and 14931 remained on benefit. Thus the escape rate for new recipients was .271 and the transition rate .729. The remaining rates can be calculated in the same manner.

The results of these exercises are reported in Table 15 and Table 16. Table 15 reports our estimates of the monthly transition and escape rates. The data in this table should be compared with the data in Table 6 (which records transition and escape rates for the registered unemployed). Transition rates for new benefit recipients are greater (and escape rates lower) than is the case for the newly registered unemployed. The difference is quite large and needs to be explained. Most likely two factors are responsible. The first is the stand-down period required before the unemployed can obtain the unemployment benefit. This varies from seven to fourteen days depending on an individuals circumstances. During this period many of the individuals who may readily find a job will do so. Thus they will not entre the

16. Contribution of Spell on Benefit of Specified Duration to Total Spells on Benefit and to the Average Stock on Benefit: 1981 I - 1983 II

	Total		16-24		25-39		40+	
	Male	Female	Male	Female	Male	Female	Male	Female
Completed Spells on Unemployment Benefit								
1. Proportion of Spells ending within 1 month	27.1	24.9	28.3	25.1	25.8	25.1	23.6	20.8
2. Proportion of Spells exceeding 3 months	41.0	42.7	38.5	42.2	43.9	42.9	47.9	52.7
3. Proportion of Spells exceeding 6 months	19.7	20.6	17.8	19.8	21.8	21.5	24.6	31.7
Proportion of Total on Benefit by Spell Length								
4. Less than 1 month	7.8	6.7	9.5	7.2	6.8	5.9	4.4	2.9
5. More than 3 months	70.1	72.4	63.8	70.0	74.0	75.7	82.7	88.1
6. More than 6 months	41.3	44.6	31.6	39.8	46.4	51.8	62.4	74.1

Source: Calculated from data provided by the Department of Social Welfare.

unemployment benefit records although they will be counted as having registered as unemployed. The second explanation is the likely incentive to remain unemployed longer offered by the benefit itself.

For the groups that are comparable the transition and escape rates between the two sets of data are similar for those who have been on their respective list for one and two months. However, the drop (rise) in the transition (escape) rate that occurs for the registered unemployed after three months is not as marked for those in receipt of benefits. This finding adds further evidence to support our earlier contention that the rise in the escape rate after two to three months of unemployment was largely the result of discouraged workers failing to maintain their registration. The transition and escape rates for those whose spell is longer than six months appears to be similar for both groups of data.

Table 16 records the contribution of spells on benefit of a specificed duration to total spells on benefit and to the average stock of benefit recipients over the period. The findings reinforce our previous analysis regarding the importance of long spells in determining the stock of unemployed. Indeed, the results from Table 16 suggest that our work with data on registrations from the Department of Labour may understate the importance of long spells in contributing to unemployment. For males, spells on benefit of less than one month account for 27.1 percent of spells but only 7.8 percent of the

17. Average Completed Duration on Unemployment Benefit[a] (Weeks)

Year	Male	Female	Total
1960[b]	8.8	14.3	9.3
1961	9.7	12.8	9.9
1962	6.7	7.9	n.a.
1963	10.4	9.5	n.a.
1964	10.8	9.4	n.a.
1965	8.8	11.4	n.a.
1966	8.7	8.9	n.a.
1967	5.2	6.2	n.a.
1968	7.8	7.9	n.a.
1969	12.2	12.0	n.a.
1970	9.6	10.5	n.a.
1971	8.0	10.6	8.5
1972	8.0	8.7	8.2
1973	11.0	13.9	11.9
1974	8.4	8.8	8.6
1975	6.7	6.8	6.7
1976	7.8	9.8	8.6
1977	7.5	9.4	8.3
1978	13.2	15.3	14.0
1979	14.2	15.7	14.7
1980	13.3	14.6	13.7
1981	16.2	17.4	16.6
1982	15.7	16.7	15.9
1983[c]	15.7	16.7	16.1

[a] Unemployment benefits which ceased during the calendar year.

[b] Year ended March 31 of following year.

[c] Average of March and June quarters.

Source: Department of Social Welfare, (various).

average stock on benefit. For females the respective values are 24.9 percent and 6.7 percent. On the other hand spells in excess of six months account for 19.7 percent of all male spells and 20.6 percent of all female spells. However spells of greater than six months account for 41.3 percent of the average male stock of benefit recipients and 44.6 percent of the female stock. In both cases over 70 percent of the average benefit recipient stock is accounted for by spells on benefit of greater than three months.

Finally, Table 17 indicates how the average duration of completed spells on unemployment benefit has moved over time. For both males and females there is an obvious cyclical sensitivity which dramatically manifests itself in the post 1977 period - the period in which New Zealand's economy moved further into recession.

4. EXPERIENCE WEIGHTED SPELL LENGTH

The analysis presented above suggests that estimates of ACD, by themselves, are unable to provide an accurate picture of the unemployment situation. In particular they tend to give the impression that long-term unemployment (i.e. in excess of six months) is relatively unimportant. Our subsequent study of the concentration of unemployment demonstrated that this is a misleading impression. The problem here is not one of measurement but one of appropriateness. ACD measures treat the inanimate spell concept as the prime concern, rather than the person experiencing the unemployment. As we have already seen ACD statistics may be quite short, given a high proportion of short spells, and yet much of the unemployment may be spent in long spells.

Because of the forgoing problem, Main (1981) has suggested an alternative which concentrates on the persons experiencing unemployment and which is termed the experience-weighted spell length (EWD). In terms of Figure A it is equal to

$$EWD = \frac{C_1 + C_3 + C_4}{3} \tag{4.1}$$

This statistic measures the average length of spell that will be experienced by those currently unemployed. As Main writes "... in a sense it measures the average spell length in which the observation day of unemployment was spent". In calculating the statistic we take advantage of the length biased nature of our sample and the fact that, on average, each observed spell is only halfway to completion.

The length biased nature of the sample means that longer spells have a greater opportunity of being included than shorter spells. This is an advantage because we wish to weigh spell lengths by the unemployment experienced. Thus spells in which greater unemployment experience has been incurred will be more readily observed and, Main argues, ensure that spells of different length will be sampled in the appropriate

18. Experience Weighted Duration of Unemployment Spells 1974-1983 (Registered Unemployed)

Period	Experience Weighted Duration (Weeks)	
	Male	Female
December 1974	11.0	12.4
December 1975	10.4	12.6
December 1976	14.4	14.6
December 1977	10.6	12.2
December 1978	22.4	23.2
December 1979	20.6	19.8
December 1980	21.8	19.6
December 1981	27.8	27.0
December 1982	24.6	24.2
December 1983	29.0	30.0

Source: Computed from data in Department of Labour, (various), and from unpublished data obtained from the Department of Labour.

relative frequencies. As each spell is roughly halfway to completion doubling the observed spell length will provide an estimate on EWD. In terms of our previous analysis in Section 2.3 this gives

$$EWD = \frac{2\ (T_1 + T_3 + T_4)}{3} \tag{4.2}$$

$$= AID \times 2 \tag{4.3}$$

Main proceeds to show that if all spells were of equal lengths (i.e. variance of individual spell duration equal to zero), then ACD and EWD would be identical. As the variance of spell lengths increases, the experience weighted measure, EWD, will rise giving, as it does, more weight to the longer spells in which comparatively more unemployment is spent.

Unfortunately in estimating EWD we must assume that a steady-state exists. When unemployment is growing there will be a relatively high number of recently unemployed who by definition will have little unemployment experience to date, irrespective of their final experience. Thus EWD will be underestimated. Similarly when unemployment is falling EWD will provide an upward bias.

Results based on this method are recorded in Table 18 (for registration data) and Table 19 (for unemployment benefit recipient data). From Table 18 we can see that the average length of spell in which a period of unemployment was spent, EWD, appears to have always been quite

19. Experience Weighted Duration of Spells on Unemployment Benefit (Weeks)

	Total		16-24		25-39		40+	
Period	Male	Female	Male	Female	Male	Female	Male	Female
31. 3.81	50.0	45.6	40.0	40.6	53.8	53.4	78.0	82.8
30. 6.81	49.8	50.2	38.2	44.0	54.4	59.2	77.8	91.8
30. 9.81	49.8	55.6	38.2	48.2	51.6	64.6	75.8	98.8
31.12.81	53.4	50.8	37.0	43.2	59.8	65.4	90.4	92.6
31. 3.82	59.8	53.0	40.2	44.2	66.6	68.0	102.4	102.0
30. 6.82	55.2	55.0	36.6	45.2	60.4	68.8	99.2	107.4
30. 9.82	46.0	56.0	33.0	45.2	47.4	70.6	78.8	108.4
31.12.82	41.4	44.4	27.8	34.6	46.8	59.6	79.8	106.2
31. 3.83	46.6	47.6	33.8	38.4	51.2	60.8	83.6	106.2
30. 6.83	48.0	52.4	36.6	43.0	51.0	66.2	81.4	105.8

Source: Calculated from data provided by the Department of Social Welfare.

long. As the recession has worsened EWD has more than doubled. Again the average length of spell of the currently unemployed of 29 weeks for men and 30 weeks for women would seem to refute any theories of voluntary unemployment or search related behaviour. This conclusion is reinforced by the data in Table 19 which shows that the average length of a spell on unemployment benefits experienced by those currently on benefits was 48 weeks for males and 52.4 weeks for females in the second quarter of 1983. For both men and women over forty this figure has, on recent occasions, exceeded two years.[12]

5. MULTIPLE SPELLS OF UNEMPLOYMENT

Before concluding this chapter it is important to comment on an aspect of unemployment that unfortunately cannot yet be examined in the New Zealand case. That is the fact that there are many persons who, even over a short period, suffer from more than one spell of unemployment. For them the duration of a completed spell, the variable which is of major concern in this chapter, understates their unemployment experience.[13]

The "search" view of unemployment sees the typical spell of unemployment as short and bounded on either side by periods of long job tenure. Thus it is believed that individuals will suffer only a single spell of unemployment over a fairly long period of time. We have already shown in this chapter that although measured ACD is short to moderate in length a large amount of unemployment is confined to spells of long duration. Trivedi and Baker (1982) show, with Australian data, that in 1979, 82 percent of all unemployed experienced one spell while 10 percent experienced 2 spells and 7.6 percent experienced more than 3 spells. Thus, about 20 percent of the unemployed in Australia experience two or more spells of unemployment in a typical twelve month period. Between 1972 and 1979 about 40 percent of spells were repeat spells. Similar data produced by Akerlof and Main (1980) for the USA, show that there, 50 percent of spells were repeat spells. Clearly, in these two countries, repeat spells are numerically important.

In addition, Akerlof and Main found that the average length of single spells of unemployment is longer than the average length of multiple spells. Consequently, they argue, statistics on ACD seriously underestimate the unemployment experience of individuals who experience a single spell of unemployment (because on average single spells are longer than multiple spells) and of individuals who experience multiple spells of unemployment (because the unemployment experience of these persons includes the multiplicity of their spells).

Two sources of potential data on the multiplicity of unemployment spells in New Zealand exist. The first source is the records kept by district employment offices of the Department of Labour. This data is not however available to the public because of the confidential nature of the files. It is also unlikely that staff in the department will ever be called upon to retrieve the information in a form that can be made publicly available. The second source is the data kept by the Department of Social Welfare. Data recorded on their computer files is currently in the process of being "tagged" in a manner that will enable multiple spells of benefit holding to be determined. This should, in the future, provide researchers with the opportunity of seeing how important multiple spells are in the overall unemployment (benefit) picture in New Zealand.

6. CONCLUSION

In this chapter we have considered the question of how long is a typical spell of unemployment. An answer to this question is important because search theorists argue that spells of unemployment are typically of short duration. We examined a number of concepts of unemployment spell lengths. The first, average interrupted duration, was considered an unsuitable measure because of the problem of length biased sampling. An alternative, average completed duration, was discussed and estimates made. At first our findings seemed to support the search theoretic hypothesis but when an analysis of the concentration of unemployment amongst spells of different length was undertaken it was found that long spells accounted for a sizeable proportion of total unemployment. In order to reflect the concentration of unemployment in lengthy spells a measure of experience weighted duration was considered. Finally a brief comment was made on the possibility of individuals experiencing more than one spell of unemployment but no examination was possible because the data was not available.

In summary it appears reasonable to argue that, notwithstanding the fact that a great many spells are short, it is the long spells that account for a considerable amount of the unemployment. Secondly, long spells of unemployment cannot be easily accommodated within a search theoretic explanation of unemployment so that search theory cannot be regarded as a satisfactory explanation of observed unemployment.

NOTES

1. To the extent that these two assumptions do not hold our results will be biased. As we will see, this problem does not exist with data from the Department of Social Welfare.

2. This thesis has, in the main, restricted the analysis of unemployment in New Zealand to the period 1960 to 1981. However data, such as that reported in Table 2 and data to be introduced later in this chapter, is not available prior to March 1981. Because of the importance of this material it was felt that it was necessary to extend our period of analysis, for this chapter, to July 1983.

3. Unemployment benefits, in New Zealand, are not payable to anyone under the age of sixteen. Therefore our lowest age group is confined to those 16-24 years rather than 15-24 years as in the case of registered unemployment. In addition the Department of Social Welfare does not record data on benefits paid to school leavers.

4. After Salant (1977), we note that AID and ACD are related in the following way:

$$\frac{AID}{ACD} = \frac{1}{2} \left\{ \frac{Var\ C}{ACD^2} + 1 \right\}$$

so that if Var C is negligible AID = ½ ACD.

5. In the above equation, if the escape rate is constant the right hand term equals unity, while if the escape rate function decreases (increases) monotonically as unemployment progresses, the term exceeds (is less than) unity. See Barlow and Proschan (1967), p.33.

6. All evidence to date suggests that this last proposition is the most likely to occur. See for example Fowler (1968), Kaitz (1970), Salant (1977), Paterson (1980) and Hason and De Broucker (1982).

7. Our method of calculating the transition rate for the inflowing group and the subsequent adjustments that this requires to the transition rates calculated from data in the body of the table have not been used by other authors. However, our procedure has two advantages. Firstly, our estimate of ACD will be more conservative because we allow for a greater impact of the traditionally higher escape rates in the early stages of a period of unemployment. This is an advantage because we wish to use our findings as an argument against search theory which predicts that unemployment will commonly be found in spells of short duration. Secondly, expressing our transition and escape rates in this form is convenient when we come to generate the distribution of completed spells by time period and the proportion of total unemployment contributed by spells of t-time units length.

8. See Gregory and Patterson (1980), p.7.

9. See Hason and De Broucker (1982), p.739.

10. See, for example, Hason and De Broucker (1982), and Bowers (1981).

11. Data, broken down by age group, was not available for this earlier period. In addition the escape rate for unemployment starters had to be estimated in a manner similar to that described for the sub groups in Table 5.

12. The EWD measure is interpreted, in this chapter, as a measure of the extent to which current unemployment is concentrated in spells of long duration. For this reason it is preferred to AID data which, Layard (1981) has argued, can, in a steady state, be interpreted as the average length of time that those already unemployed will remain unemployed <u>from now on</u>. That this latter figure is longer than ACD is, however, additional evidence against extreme versions of the voluntary search unemployment approach.

13. A number of writers have recognized this problem. See, for example, Kaitz (1970), Akerlof and Main (1980), Trivedi and Baker (1982), Hason and De Broucker (1982) and Bjorklund (1983).

CHAPTER 8

THE ESTIMATION OF UNEMPLOYMENT TYPES IN NEW ZEALAND[1]

1. INTRODUCTION

As we have seen, the extreme search theoretic view of unemployment is that all unemployment is voluntary and that demand-management policies cannot be used to lower the "natural" rate of unemployment. In Chapter 5 we reported Thirlwall's (1983) comment that Friedman considered that the natural rate of unemployment, in general equilibrium, would be comprised of frictional and structural unemployment. Less extreme advocates of search theory are prepared to admit the existence of demand-deficient unemployment but will argue that the rise in unemployment experienced in recent years can be substantially attributed to increasing rigidities and frictions within the labour market. Finally, there exist a number of writers who accept a demand-deficient explanation for the rise in unemployment but who argue that demand stimulation will not be an effective remedy for the problem of unemployment because of structural problems that have developed in the labour market and which will prevent a return to the low levels of unemployment previously experienced.

The purpose of this chapter is to estimate series for various unemployment types in New Zealand and to use these series to discern whether any of the foregoing interpretations are of relevance to the unemployment problem currently being experienced by this country. We commence by providing a description of unemployment types and consider how our resultant definitions can be made operationally useful (Section 2). Two alternatives present themselves. The first, an *ex poste* measure is described in Section 3, where a simple application of the method is made. The second, an *ex ante* measure described in Section 4, forms the basis for the remainder of the chapter. In Section 5 we consider the problems associated with the *ex ante* measure of unemployment types. An empirical application of the method and a detailed discussion of the results obtained is undertaken in Section 6. Section 7 concludes.

2. THE CLASSIFICATION OF UNEMPLOYMENT TYPES

When attempting to define categories of unemployment, as when defining unemployment itself, concern with diagnosing the causes of the original displacement of workers leads to a theoretical dead end. The diagnosis must search for reasons for failure to re-employ experienced workers and to hire new labour-force entrants. The reasons for original disemployment are of no concern if re-employment is assured. It has often been taken as useful to classify unemployment into two basic categories: unemployment resulting from deficient-demand and unemployment due to frictions and labour market adjustments. Each form of unemployment, thus described, can be said to possess its short-and long-run variants, giving the following four-way classification:

	Short Term	Long Term
Deficient Demand	Cyclical Unemployment	Growth-gap Unemployment
Labour Market (mal) adjustment	Frictional Unemployment	Structural Unemployment

This classification omits seasonal and hard-core unemployment which can be considered as subsets of either frictional or structural unemployment. In what follows we will also ignore the distinction made between growth-gap unemployment and cyclical unemployment, lumping them together under the title of demand-deficient unemployment.

2.1 Frictional Unemployment

Frictional unemployment refers to short-term unemployment due to normal market adjustments. In the economy unemployment and vacancies exist side by side, because it takes time to match jobs and men appropriately. The frictionally unemployed are therefore those unemployed for whom jobs are available within reasonable reach, which are reasonably suited to their skills and pay current wage levels. Thus frictional unemployment arises simply because it takes time and resources for workers to change jobs, either voluntary or involuntary, even though suitable job vacancies exist and can be found without the worker having to adjust his broad occupational status or his reservation wage.

Frictional unemployment, as a short-run concept, assumes relative constancy of the state of technology, the aggregate final-product mix and the distributions of skills within the labour force. It is also assumed to be independent, theoretically, of the level of demand and therefore will exist at full employment. (This assertion is explained below). Although frictional unemployment cannot be eliminated in an aggregate sense, those members of the work force whose unemployment, at any point in time, is considered frictional can reasonably expect to obtain a job in the near future as jobs are available for them which are well suited to their abilities. The workers are unemployed, therefore, because they are not aware of the opportunities available to them.

2.2 Demand-Deficient Unemployment

Short-term, demand-linked unemployment is often called cyclical unemployment, since it appears as a characteristic of business cycle fluctuations. It is the unemployment caused by levels of final demand sufficiently low to leave unutilized numbers of labour-force participants with currently used labour skills. Production short of the full-employment level leaves a gap which must be closed through increased business investment, government spending, foreign sales, or a rise in consumption relative to income. In the long-run, the labour force grows and technology changes, while new labour skills are learned and others discarded. On the capacity side, labour force and productivity growth raises the level of output needed for full employment. If the labour force has kept constant the ratios of its skill composition to skills required in production, unemployment beyond frictional levels is still due to inadequate demand, but the gap between full-employment levels of output and actual levels of output can appear not only in recessions but also at cyclical peaks. The long-run gap at cyclical peaks, which is a function of the spread between the rate of change of labour force capacity and the rate of change of output, creates what is sometimes called growth-gap unemployment.

In this chapter both types of unemployment are combined as demand-deficient unemployment. Demand-deficient unemployment is said to occur when there is not enough aggregate demand to provide work for the whole labour force no matter how it is trained or deployed.

2.3 Structural Unemployment

Structural unemployment occurs when the unemployed are mismatched with job vacancies because they do not possess the right skills or live in the right places. It comes about in the long-run and can arise regardless of the level of demand. As technology, the composition of final demand, and the location of industry change, these structural shifts affect the composition of labour skill requirements. The structurally unemployed are those whose skills are either no longer used in output and are also not transferable to other occupations, or their skills are required in smaller proportions to output and there are skill complements needed for output which are in short supply. The key to the structural problem is the mismatching of specific labour-skill demands and supplies where there is limited transferability of skills and limited substitutability among skills.

Finding jobs for the structurally unemployed requires more than search in local labour markets, for workers must be retrained or change location. Additionally, when technical change involves the absolute uselessness of a skill, no amount of increase in demand or increased supply of any other skill will provide employment for the displaced workers, unless they are qualified and willing to do some other work. Structural unemployment, due both to the absolescence of skills and the smaller proportions of certain skill requirements in production, requires worker retraining if an efficient solution is to be found.

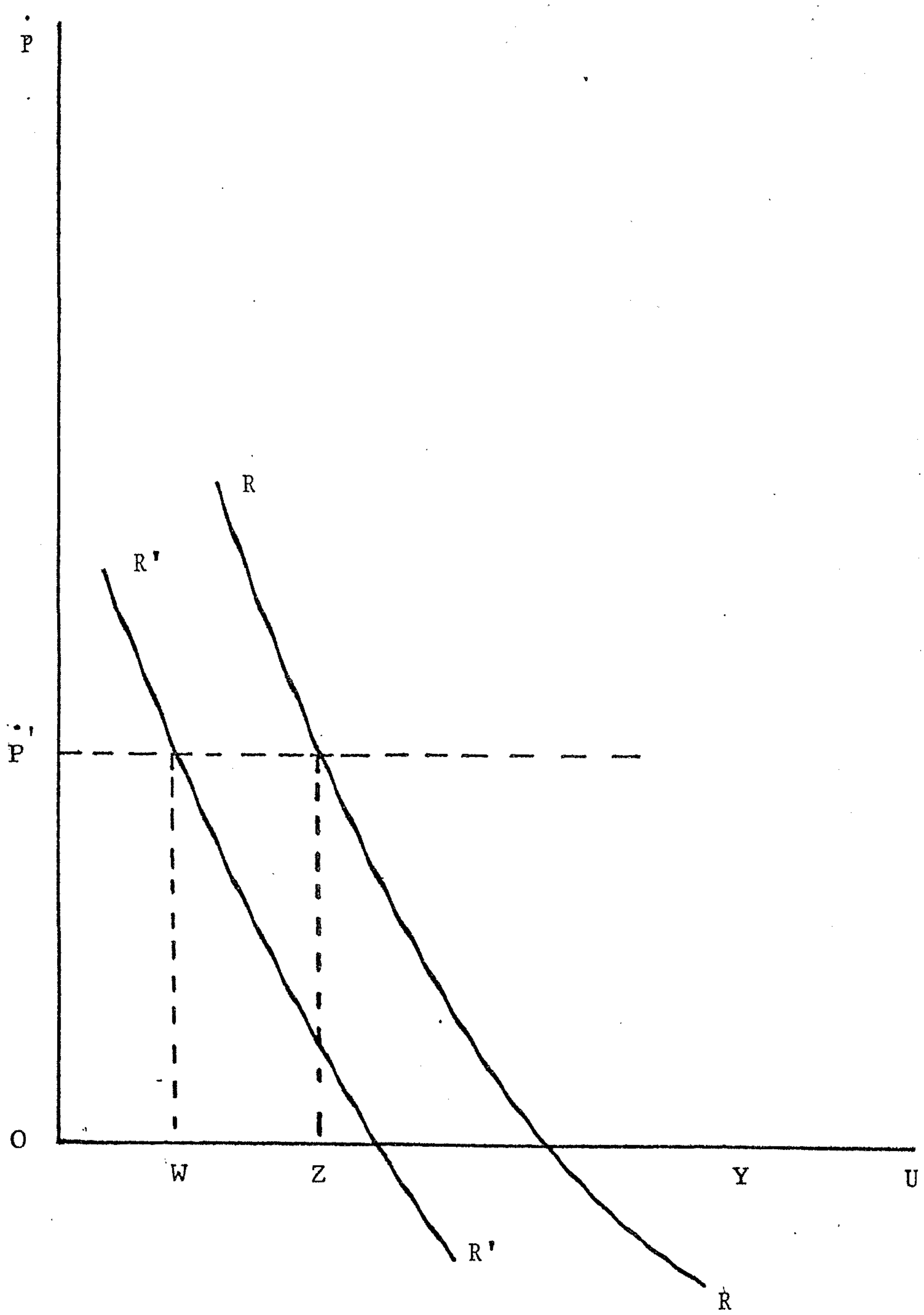
The concept of structural unemployment became the centre of a controversy, among American economists in the early 1960s. The pro-structuralists attempted to show that America's higher than normal unemployment rates after 1957 were the result of structural changes in the economy and hence that the unemployment was structural (see

Demsetz 1961). The anti-structuralists, on the other hand, attempted to show that there was little or no evidence for a worsening in structural unemployment in the American economy.[2] Unfortunately much of the debate confused the concept of structural unemployment with the concept of the structure of unemployment. (The later concept was the subject of Chapter 2 i.e. it is associated with the impact of unemployment on specific groups). The major difficulty with much of the early investigation into structural unemployment was that the authors focused almost exclusively on the labour supply side of the issue. It was not until Lipsey (1965) entered the debate that the role of labour demand in determining unemployment types was established. Lipsey wrote:

> It is a basic theme of my own paper that <u>nothing</u> about the causes of unemployment (at least, on the question of whether it is structural or deficient-demand in nature) can be determined by studying the characteristics of the stock of unemployed .... (Lipsey 1965 p.222)

To be useful, a classification of unemployment needs to satisfy two main conditions. First, it should lend itself to measurement. Second, it should be based on clearly defined, objective criteria to avoid arbitrariness and inconsistency in the process of measurement. In an attempt to meet these criteria two different methodologies have been developed. The approach traditionally used within the United States has been to classify unemployment according to the possible

FIGURE A An <u>Ex Poste</u> Measure of Unemployment Types



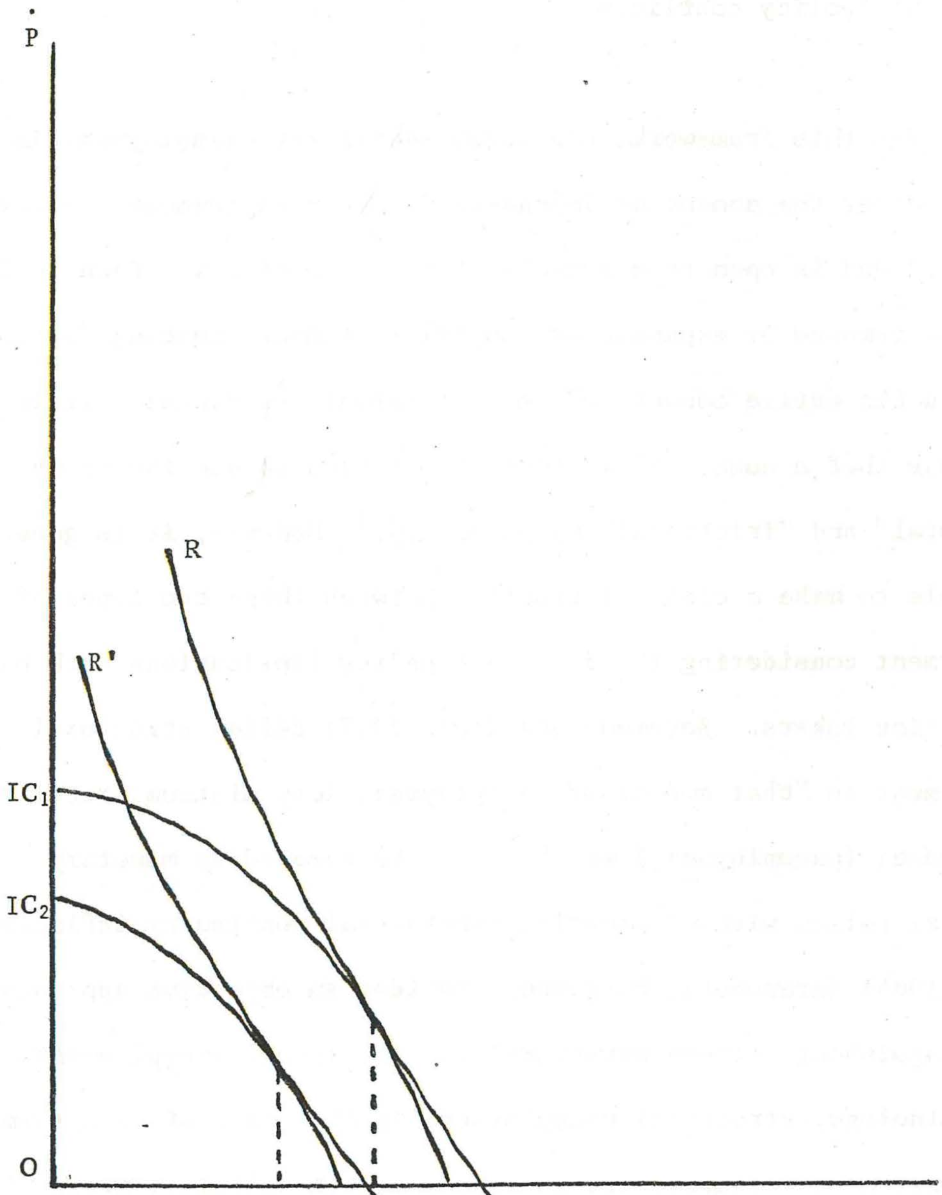
means of reducing it, assuming certain constraints on action. This has become known as the "cure" basis for classifying unemployment. The alternative is to classify unemployment types according to cause.

3. UNEMPLOYMENT CLASSIFICATION BY CURE

If unemployment is classified according to its cause a measure can be provided of unemployment types before remedial action is taken. However, measurement based on a "causal" approach is difficult because an index of demand is required before the level of demand-deficient unemployment can be determined and knowledge of the types of labour in demand and supply is required before estimates of structural and frictional unemployment can be made. Consequently, economists have tended to classify unemployment according to the possible means of curing it. The "cure" approach to classifying unemployment produces <u>ex post</u> measures of each type of unemployment depending on the success of various policies in reducing unemployment within the constraints laid down. For example, the distinction has been made between unemployment that can be eliminated without causing intolerable inflation and that which can't (Thirlwall 1969). In Figure A, $\dot{P}$, represents the percentage rate of change in prices, U, the proportion of the labour force that is unemployed and $O\dot{P}$, the level above which price rises become unacceptable. Combinations of U and $\dot{P}$ which can be attained by varying the level of aggregate demand are given by the RR curve. The share of demand-deficient unemployment in the total unemployment rate is given by the distance between the actual rate of unemployment, OY, and the unemployment rate associated with price increases of $O\dot{P}'$ percent. Demand-deficient unemployment is therefore equal to the distance OY-OZ as this amount of unemployment could be removed by expansionary monetary and fiscal policies without unacceptable policy conflicts.

Within this framework, non-demand-deficient unemployment is a residual after the amount of demand-deficient unemployment has been determined and is open to a variety of interpretations. Because it cannot be removed by expansionary policies without creating "excessive" inflation the entire amount, OZ, may be termed structural. It is in this sense that a number of writers have tended to use the terms "structural" and "frictional" synonomously.[3] However, it is generally preferable to make a clear distinction between these two types of unemployment considering the different policy implications each has for decision makers. Bergmann and Kaun (1967) define structural unemployment as "that amount of unemployment less minimum frictional and seasonal (unemployment) which cannot be removed by monetary and fiscal policy without creating substantial continuing inflation". Berman (1965) (presumably Bergmann) provides an objective approach to distinguishing between structural and frictional unemployment. In her terminology, structural unemployment is that part of unemployment which could be eliminated through labour market policies, except for

FIGURE B Lipsey's Ex Poste Measure of Unemployment Types



that amount which could be eliminated by general demand-stimulation measures, unaccompanied by other measures, without violating the price constraint. That is, if labour market policies could displace the existing trade-off curve in Figure A to R'R' unemployment, as measured by the difference between OZ and OW, could be regarded as structural. Any remaining unemployment would presumably be frictional.

However, perhaps the best-known ex-post definition of unemployment types is that of Lipsey (1965). Lipsey introduces the concept of the policy maker's concave indifference curve between the discommodities inflation and unemployment. In Figure B, the level above which inflation would be intolerable is determined by the tangency of the RR curve with one of these indifference curves (IC_i). Structural unemployment is defined as the amount of unemployment that can be removed by structural cures "some of which pay for themselves on an analysis of the money costs and money benefits and some of which are justified because the non-pecuniary social benefits are judged to justify the net money costs of the schemes". The RR curve shifts to the left as a result of the structural cures and the amount of structural unemployment then depends on the new point of tangency of the R'R' curve and one of the indifference curves (IC_2). In this case the contribution of structural unemployment to the total unemployment rate of OY is represented by the distance OZ' – OW'.

Given Lipsey's definition, and provided one can agree on the specification of the trade-off relation it may be possible to determine whether or not structural unemployment has increased in a particular period. To this end Vanderkamp (1966) developed a simple simultaneous model of wage and price level determination which is presented as a reduced from equation in (3.1)..

$$\Delta CPI = a + b\ \Delta Pm + c\ \Delta CPI_{t-1} + d\ 1/U \tag{3.1}$$

where ΔCPI = Change in the Consumer Price Index,
ΔPm = Change in the Import Price Index,
U = Registered unemployment

An increase in structural unemployment, as defined by Lipsey, will result in an upward shifting of the relation between unemployment and the rate of price change. That is, other things being equal, a particular unemployment rate will now be compatible only with a higher rate of inflation than in the past. To test for any increase in structural unemployment time variables are included in the reduced form price equation mentioned above. If such variables obtain coefficients statistically different from zero the conclusion may be drawn that the trade-off relation between price changes and unemployment has in fact worsened.

1. Reduced Form Price Change Equations

Intercept	ΔPm	ΔCPI_{t-1}	1/U	T_1	T_2	T_3	$\bar{R}^2$	D.W.
1.144 (2.500)	0.046 (1.430)	0.599 (4.240)	-0.017 (-0.460)				0.437	2.230
0.958 (2.120)	0.039 (1.250)	0.458 (2.940)	0.015 (0.390)	0.031 (1.830)			0.476	2.110
1.064 (2.290)	0.043 (1.340)	0.562 (3.860)	0.004 (0.100)		0.027 (1.02)		0.437	2.190
1.091 (2.410)	0.056 (1.700)	0.491 (3.07)	0.010 (0.240)			0.486 (1.360)	0.452	2.160

NOTE: Numbers in parenthesis beneath coefficients refer to t values. Degrees of freedom equal 31 for first row and 30 for remaining rows.

To allow for various patterns of change in structural unemployment in the New Zealand case the following three time variables are included.

T_1 - a linear time trend which is zero in the fourth quarter of 1971, one for the first quarter of 1972, etc; this variable therefore tests whether structural unemployment has continuously increased over the period 1971 (IV) to 1980 (II).

T_2 - this variable is zero for all quarters up to 1976, and it is a linear time trend from the first quarter of 1976 to the second quarter of 1980; the question asked in this, case is whether the marked increase in unemployment following 1976 was due to structural unemployment becoming increasingly important.

T_3 - a step variable which is zero in the pre 1976 years and unity from 1976 onwards; this variable tests if structural unemployment has suddenly become important in 1976 but has not increased further since then.

The tests, utilizing the ordinary least squares procedure, are reported in Table 1. Quarterly data was obtained from Department of Statistics (various,a) for the period 1971 (IV) - 1980 (II). The tests do not support the conclusion that structural unemployment in the New Zealand economy has increased significantly during the 1970s, and more particularly since 1976. In addition the results show little support for the existence of a Phillips type relationship in New Zealand over the period.

The considerably more difficult task of estimating the actual amount of unemployment that was frictional, structural and demand deficient on the basis of the "cure" approach has not been attempted. Apart form the technical difficulty of doing so several definitions of structural unemployment are possible, the position of frictional unemployment is obscure and even the definition of demand-deficient unemployment varies according to whether use is made of the concept of an intolerable rate of inflation or Lipseys' "trade-off" model. Thus, although popular, the cure approach to classifying unemployment types is clearly fraught with difficulty. Such ambiguity over terms and the consequent arbitrariness in the process of measurement must be avoided if useful and objective measurements are to be made. It is for this reason that the "causal" approach is to be preferred.

4. UNEMPLOYMENT CLASSIFICATION BY CAUSE

The major practical difficulty involved in using the "causal" approach is identifying the level of unemployment at which the available labour supply equals unsatisfied demand. One solution, suggested by Perlman (1969) and Thirlwall (1974), is to equate the supply of labour with the sum of workers employed plus the number unemployed and the demand for labour with the sum of workers employed plus the number of unfilled vacancies. As the number of workers employed is common to both concepts the demand for labour will equal the supply of labour where vacancies equal unemployment. When the number of workers unemployed exceeds the number of vacancies the supply of labour will be greater than the demand for it and demand-deficient unemployment will exist. The amount of demand-deficient unemployment will be equal to the excess of registered unemployed over notified vacancies. The remaining unemployment (equal to the number of notified vacancies) is termed non-demand-deficient and consists of workers who are either frictionally or structurally unemployed. Two major types of structural unemployment exist. The first, occupational structural unemployment, arises when an unemployed worker is not qualified to fill an existing job opening. The second, geographic structural unemployment, results from the inability or unwillingness of the unemployed worker to move between regions in order to fill job vacancies for which he is qualified.

At the macroeconomic level it would be impossible to separate structural from strictly frictional unemployment. Fortunately, this problem can be resolved by operating initially at the micro level and then aggregating. Given the availability of data disaggregated by occupations. The excess of unemployed to job openings in a particular occupation measures the contribution of that occupation to demand-deficient unemployment and/or to occupational structural unemployment.

For occupational structural unemployment to exist there must be other occupations in which vacancies exceed unemployment. The amount of occupational structural unemployment will therefore be found by measuring the excess of vacancies over unemployment in all those occupations in which vacancies are greater than unemployment - provided that unemployment in the economy as a whole is greater than total vacancies.[4] For periods in which aggregate vacancies exceed aggregate unemployment there can be no demand-deficient unemployment. Under these circumstances occupational structural unemployment will be represented by the excess of unemployment over vacancies in those occupations in which unemployment is greater than vacancies.[5]

Geographic structural unemployment arises, as we have seen, because a vacancy exists in a region other than the one in which the unemployed worker is found. To measure the extent of geographic structural unemployment we require data disaggregated by region and occupation. In this paper geographic structural unemployment will be estimated on the assumption that the Employment Districts of the Employment and Vocational Guidance Service represents local labour markets. Geographic structural unemployment is the sum of the excess of vacancies over unemployment in an occupation in the regions when the occupation, as a whole, is experiencing an excess of unemployment over vacancies, plus the sum of the excess of unemployment over vacancies in an occupation in the regions when the occupation, as a whole, is experiencing an excess of vacancies over unemployment.[6]

Frictional unemployment, arising from the existence of suitable vacancies in the region in which the unemployed worker is found, can therefore be calculated as a residual. It will be equal to total unemployment minus the sum of demand-deficient, occupational structural and geographic structural unemployment.[7]

5. THE PRACTICALITY OF CLASSIFICATION BY CAUSE

When Perlman proposed classifying unemployment by cause the argument was largely academic since vacancy statistics for occupation and region were not published in the United States. However in the New Zealand context such figures are available and the possibility therefore exists of computing estimates of demand-deficient, structural and frictional unemployment utilizing Perlman's methodology. However, before doing so, two important aspects need to be considered. The first involves the influence of changes in the demand for labour on the calculations. The second involves the nature of the problems inherent in the data and the impact of these problems on the estimates produced.

5.1 The Influence of the Pressure of Demand

An increase in the demand for labour that is met will result in a fall in the level of unemployment and no change in the level of vacancies. On the other hand if the increase in the demand for labour is not met there will be an increase in the number of vacancies and no change in the level of unemployment. There is no way of telling which of the two possibilities will occur or in which region or occupation the change will take place. Since the measures of the various types of unemployment are dependent on calculations made from data across both occupations and regions, comparisons of types of unemployment over time, or between regional labour markets, only make sense at the point of zero excess demand (i.e. where total vacancies equal total unemployment) or when the pressure of demand, as measured by the ratio of vacancies to unemployment, is the same.[8]

5.2 The Impact of Data Recording Problems

Dow and Dicks-Mireaux (1958) write:

> There are good prima facie reasons for distrusting the statistics of unfilled vacancies since they neither record transactions nor register decisions, but represent a sort of queue. The size of the queue may be either more or less than the real unsatisfied demand, people may either duplicate orders or join several queues; or they may give up trying and not join a queue at all.

Now, over twenty years later, much the same thing can be said of similar data collected in New Zealand and elsewhere. Inaccuracies in data introduce bias into computations and it is important to understand the limitations of the statistics and the way in which such constraints impinge on the results obtained from them. Both unemployment and vacancy statistics may suffer from over-recording or under-recording. Unemployment statistics are under-recorded when people who are unemployed fail to register with the unemployment service. There are a number of reasons for failing to register. These include the belief that registration would be of no benefit in obtaining a job for the party concerned. Two examples of this phenomenon are the skilled worker who does not expect to be unemployed for long and women who would be quite prepared to entre the work-force if they thought that there were jobs available. Second, those people who are ineligible to draw unemployment benefits may lack the incentive to register. This group will undoubtedly include a large number of married women. Additionally, some of the unemployed may prefer to utilize alternate forms of securing jobs. Such methods may include answering newspaper advertisements, relying on word of mouth or seeking help from private employment agencies.

Vacancies may be understated if employers prefer not to use the government employment service but opt to recruit from past lay offs, through the factory "grapevine", from advertising in trade journals and newspapers and from specialized agencies. Overstating occurs, if jobs, which have been filled, are not removed from the list and when employers, in an effort to boost their chance of gaining workers, overstate their requirement.

Over-recording will occur with unemployment data if the employment service neglects to remove from their list workers who have obtained jobs and if unemployed workers have registered more than once or when in fact they do not wish to work.

Even if recorded vacancy and unemployment data is considered unrealiable the impact of the problems outlined above on the measurement of structural and frictional unemployment may not be severe if it is possible to predict the direction of the bias on the computations. During periods of general oversupply in the labour market occupational structural unemployment is calculated by measuring the excess of vacancies over unemployment only in occupations in which vacancies are greater than unemployment. If unemployment is over-recorded in such an occupation, occupational structural unemployment will be under-estimated. However, the employment service, wishing to find work for the unemployed in a slack labour market, will have an incentive to ensure that its listing of unemployed is up to date. Thus, failing to remove the names of those who have found jobs is unlikely to be a problem. It is also unlikely that illegitimate registrants will lead to an overstating of unemployment in labour deficit occupations where jobs are relatively easy to find.

Similarly, if unemployment is under-estimated in occupations experiencing an excess demand for labour, occupational structural unemployment will be over-estimated. However, while under-recording is likely to be greater when there is a slackening of the labour market generally it is less likely to occur in occupations experiencing labour shortages. This is because the unemployed in these occupations are likely to take a more optimistic view of the ability of the employment service to find them a suitable placement.

It is open to question whether or not vacancies in occupations experiencing labour supply shortages overstate or understate the true position. If vacancies are over-recorded then occupational structural unemployment will be over-estimated. However, the work of Mackay et al. (1971), suggests that in times of labour scarcity, employers fear that the fall in the ratio of skilled to unskilled will mean that if the government employment service can help them at all, it will only be able to provide less than satisfactory recruits. They may therefore prefer to employ other methods of securing labour. In addition to this, if firms believe that other firms are over-reporting, they may reason that to do so themselves will have little effect. If all firms operate on this premise the amount of over-reporting that takes place will be insignificant. It is therefore unlikely that vacancies will be over-recorded for occupations experiencing labour shortages and hence unlikely that the amount of occupational structural unemployment will be severely over-estimated.

During periods of general excess demand for labour occupational structural unemployment is measured by the excess of unemployment over vacancies in occupations experiencing an over supply of labour. If unemployment is over-recorded in these occupations and vacancies under-recorded, then occupational structural unemployment will be over-estimated. However, it is more likely that unemployment will be under-recorded in occupations with a labour surplus because of the number ineligible for unemployment benefits. It is also unlikely that vacancies in these occupations will be under-recorded as employers, although requiring less labour, will have fewer objections to the government employment service filling their vacancies. This is because the ratio of skilled and unskilled will be higher than for occupations experiencing labour shortages, and the cost of using the government's facilities less than that of private employment agencies. The net result is likely to be a slight under estimate of occupational structural unemployment rather than an over-estimate.

Geographical structural unemployment will be over-estimated if vacancies in occupations experiencing labour shortages are over-recorded and unemployment under-recorded and/or if unemployment in occupations experiencing a labour surplus is over-recorded and vacancies under-recorded. The arguments presented above suggest that vacancies may reasonably be expected to be over-recorded only in labour surplus occupations and under-recorded in labour shortage occupations. Unemployment on the other hand, is likely to be under-recorded in labour deficit occupations depending on demand conditions in the economy in general. The net result is a potential under-estimate of the true value of geographical structural unemployment.

By definition demand-deficient unemployment does not exist when labour supply is less than labour demand. However, in periods of labour shortages demand-deficient unemployment will be under-estimated to the extent that the unemployed are discouraged from registering with the employment service.

Frictional unemployment may be over-estimated. During periods of excess demand for labour both forms of structural unemployment are likely to be under-estimated. If, as we will assume, the total unemployment figure is reasonably accurate, frictional unemployment will be over-estimated. However, during times of labour surplus, it is impossible to predict the direction of the bias in the estimation of frictional unemployment. Demand-deficient unemployment will be under-estimated, as will be total unemployment. Unfortunately, this is compatible with either an under-estimate or over-estimate of frictional unemployment.

5.3 The Level of Disaggregation

Any attempt to estimate the contribution to total unemployment of various unemployment types based on the "causal" approach will be confronted by the problem of determining the appropriate level of disaggregation with respect to both regional labour markets and

and occupational groups. A labour market can be defined as an occupational/geographic entity within which there is perfect labour mobility (Armstrong and Taylor 1981). The division of the New Zealand labour market into 22 Employment Districts and 23 occupational groupings falls well short of this theoretical concept. Given that there are many hundreds of different occupations and a great deal more than 22 regional labour markets, the relatively high level of aggregation of data employed in this study will mean that structural unemployment is further under-estimated and frictional unemployment over-estimate.

6. EMPIRICAL RESULTS

Unpublished vacancy and unemployment data from the Department of Labour provided the raw material for this exercise. The data is collected on the basis of the department's 23 occupational groupings over their 22 Employment Districts at monthly intervals. This study makes use of the monthly data for March, June, September and December from March 1969 to June 1978.[9] The analysis is carried out for two groups, male and females. This classification implies that the groups belong to separate and distinct local markets, an assumption, which although not entirely true because of the overlap in the competition for jobs in some occupations, is justified by the fact that throughout the period under review supply and demand conditions between the two groups varied significantly.

The total vacancy and unemployment figures reported in this paper differ slightly from the published statistics of the Department of Labour. Full time university students have been excluded from the unemployment figures on the grounds that they are not usually regarded as members of the work-force. The Department of Labour's treatment of vacancies reported by the New Zealand Railways and the Post Office has been inconsistent over the period covered by this study. Although area break-downs of vacancies are available for the Post Office in all periods this is not true for the Railways. In neither case is any indication given of the occupational requirements of the vacancies and it is therefore impossible to determine whether such vacancies contribute to frictional or structural unemployment. Further, enquiry at regional employment offices has revealed that both Railways and the Post Office report at least some of their vacancies by occupation. To the extent that they become incorporated in the statistics for the occupational groups the inclusion of two separate categories, for total Post Office vacancies and total New Zealand Railway vacancies, introduces an element of double counting into the exercise. To avoid this, vacancies reported by the Post Office and Railways have been deducted from the Department of Labour's official figures. The procedure also enables a consistent treatment of the relationship between unemployment and vacancies across regions to be made throughout the period under review.

2. Demand-Deficient Unemployment: Males and Females: Annual Average 1969-1978

Year	Demand-Deficient Unemployment		Demand-Deficient Unemployment as a Proportion of Total Unemployment		Index of Demand	
	Male Udd(m)	Female Udd(f)	Male %	Female %	Male V(m) ÷U(m)	Female V(f) ÷U(f)
1969	293	4	14.6	0.6	1.06	1.69
1970	-	-	-	-	1.77	3.53
1971	1729	-	60.5	-	0.47	1.36
1972	3132	632	70.9	45.8	0.29	0.54
1973	102	53	7.1	8.0	1.53	1.26
1974	-	-	-	-	3.74	2.67
1975	1874	1338	61.7	81.8	0.38	0.18
1976	1971	1943	63.3	86.5	0.37	0.13
1977	3625	3065	76.7	92.6	0.23	0.07
1978	11747	8681	92.1	95.9	0.08	0.04
Average (1969-1978)	1958	1197	62.2	71.8	0.52	0.44

Source: Calculated from unpublished data provided by the Department of Labour.

6.1 Demand Deficient Unemployment

Table 2 examines the experience of the New Zealand labour market with respect to demand-deficient unemployment. For the period under review demand-deficient unemployment accounted, on average, for 71.8 percent of total female unemployment. This figure however, neglects the impact of the important changes that took place in 1975. Prior to the oil price rise demand-deficient unemployment was virtually unknown amongst women. In the recession year of 1972 it accounted for only 45.8 percent of the female unemployed compared with nearly 71 percent of male unemployment. During the remaining years, prior to 1975, little or no demand-deficient unemployment was recorded amongst females. Following 1975 however, the drastic reduction of demand in the labour market contributed increasingly to unemployment amongst both male and female workers.

Demand-deficient unemployment amongst females rose rapidly to 81.8 percent of total female unemployment in 1975, and by 1978 stood at 95.9 percent. Demand-deficient unemployment amongst males, on the other hand, rose to just under 62 percent of total unemployed males in 1975 and by June 1978 the ratio was still below the female equivalent. These findings suggest that during periods of a severe decline in economic activity women will be first to lose their jobs. Whether this is a consequence of the occupational composition of the female work force or the result of outright discrimination is beyond the scope of this chapter.

3. Occupational Structural Unemployment:

Males and Females: Annual Average 1969-1978

Year	Occupational Structural Unemployment		Occupational Structural Unemployment as a Proportion of Total Unemployment		Index of Demand	
	Male Uos(m)	Female Uos(f)	Male %	Female %	Male V(m)÷U(m)	Female V(f)÷U(f)
1969	870	255	43.3	37.4	1.06	1.69
1970	651	59	51.3	15.2	1.77	3.53
1971	558	210	19.5	32.6	0.47	1.36
1972	438	94	9.9	6.8	0.29	0.54
1973	642	162	44.6	24.2	1.53	1.26
1974	283	77	41.7	20.8	3.74	2.67
1975	563	5	18.6	0.3	0.38	0.18
1976	454	5	14.6	0.2	0.37	0.13
1977	429	1	9.1	0.02	0.23	0.07
1978	16	0	0.1	-	0.08	0.04
Average (1969-1978)	515	91	16.4	5.5	0.52	0.44

Source: Calculated from unpublished data provided by the Department of Labour.

6.2 Occupational Structural Unemployment

Table 3 records the annual averages for occupational structural unemployment over the period of our study, In it we can see the importance of occupational structural unemployment amongst men during periods of higher labour demand. In each of the periods in which the index of demand is greater than one, occupational structural unemployment accounted for over 40 percent of the total number of males unemployed. On average, in 1969, over 800 men could have found jobs if retraining facilities had been made available to them. As the table indicates, occupational structural unemployment has not been as important a problem for women. For example in only two of the five years for which demand exceeded supply is the proportion of women suffering from an occupational mismatch greater than 30 percent of total female unemployment.

Strictly speaking, however, comparisons between males and females with regard to any form of non-demand-deficient unemployment should only be made for those periods in which the pressure of demand is the same or nearly so. This has been done for occupational structural unemployment in Table 4. The proportion of unemployment that is due to occupational structural problems is clearly much greater for men than for women even when full account is taken of the influence of the pressure of demand.

4. Male and Female Occupational Structural Unemployment at Comparable Levels of Demand for Male and Female Workers

Period	Index of Demand		Occupational Structural Unemployment		Occupational Structural Unemployment as a Proportion of Total Unemployment	
	Male V(m)÷U(m)	Female V(f)÷U(f)	Male Uos(m)	Female Uos(f)	Male %	Female %
Dec. 1972	0.43	0.49	691	61	18.6	4.2
June 1973	0.90	0.83	1216	206	49.8	23.4
Sept. 1973	2.01	2.02	538	139	42.1	24.8
June 1974	3.06	3.30	396	78	47.7	21.3

Source: Calculated from unpublished data provided by the Department of Labour.

Policy proposals designed to reduce the amount of occupational structural unemployment will be most effective if concentrated in areas of male employment. Policies designed to deal directly with the structural nature of the unemployment are necessary because of the way in which it arises. Occupational structural unemployment is a result of either a shift in product demand or changes in production methods which alter the demand for specific types of labour. If relative wages fail to adjust to the shift in labour demand, surpluses and deficits in labour supply will occur. The suppression of occupational structural unemployment through a rise in aggregate demand would exacerbate the shortages of both labour and goods in occupations experiencing labour shortages. On the other hand, the elimination of structural demands will lead to a reduction in unemployment with out the inflation related to demand expansion and new job creation. Such policies may well have been appropriate in New Zealand during the early 1970s.

Care should be taken,however,to ensure the correct interpretation of the measure of occupational structural unemployment. A high value for occupational structural unemployment is not, by itself, justification for the implementation of an extensive retraining programme. Whether or not such a scheme is justified can be determined only by a thorough cost/benefit analysis.[10] Similarly the measure of occupational structural unemployment is not intended to be used as an indicator of structural imbalance in the economy. In periods when the pressure of demand is low occupational structural unemployment will also be low

5. A Comparison Over Time of Male and Female Occupational Structural Unemployment

Period	Index of Demand		Occupational Structural Unemployment		Occupational Structural Unemployment as a Proportion of Total Unemployment	
	Male V(m)÷U(m)	Female V(f)÷U(f)	Male Uos(m)	Female Uos(f)	Male %	Female %
March 1969	1.02		984		49.0	
March 1977	0.80		548		30.2	
Dec. 1969	2.23		730		54.9	
Dec. 1974	2.20		360		46.9	
Sept. 1971	0.34		542		16.8	
Sept. 1976	0.33		454		13.2	
March 1969		0.98		401		45.7
March 1973		0.86		218		26.3
Dec. 1971		1.07		379		35.5
Dec. 1974		1.02		124		25.7
June 1969		1.33		269		35.6
June 1971		1.31		40		32.1

Source: Calculated from unpublished data provided by the Department of Labour.

but this does not mean that the structural problems of the economy have been solved. During the upswings the structural imbalance will again assert itself and lead to high values for occupational structural unemployment. Some writers maintain that this is sufficient reason for initiating retraining schemes even during periods of low structural unemployment. It is believed that such policies would reduce the likelihood of the re-emergence of inflation due to structural problems as governments stimulate demand in an effort to reduce unemployment.

In recent years economists have argued that occupational structural unemployment is becoming a more serious deterrent to the attainment of full employment because it tends to arise as higher levels of overall unemployment than in the past. If this is so the low traditional levels of unemployment experienced by New Zealand will not be easily achieved in the future by demand management policies alone. In order to test this prediction it is necessary to compare the measure of occupational structural unemployment at points in time when the general pressure of demand, as given by the index of demand, has been the same or nearly the same. The result of such an exercise is presented in Table 5.

The table provides little evidence of a worsening in occupational structural unemployment. Contrary to expectations the analysis indicates a remarkable improvement between the late 1960s and early 1970s. For example male occupational structural unemployment dropped by over 44 percent between March 1969 and March 1977. The evidence also suggests a fall in occupational structural unemployment among females during the early 1970s. The December 1974 figure, for example, was over 70 percent lower than the December 1971 figure.

These findings suggest that many of the current arguments relating to the unemployment experience of the New Zealand economy are questionable. There seems little evidence to support the thesis that the current unemployment is structural in nature. Additionally, the evidence refutes the hypothesis that attempts to expand demand will lead to inflationary structural problems that are worse than those experienced in the past. Indeed, an expansion of demand appears less likely to generate inflation because of structural imbalance than was true ten years ago.

Although the type of unemployment which is more in keeping with search unemployment is frictional unemployment (to be considered presently), our findings with respect to structural unemployment are of relevance. Some portion of structural unemployment will result from workers not being occupationally flexible downwards, i.e. unemployment may result from workers failing to accept jobs that they believe are beneath their particular skill and training. Such unemployment is perfectly in accord with the concept of search unemployment. The reduction in the importance of structural unemployment, at any given level of demand, may, in part, result from New Zealander's becoming more flexible in their job requirements suggesting a reduction in unemployment due to search.

6. Male and Female Geographic Structural Unemployment at Comparable Levels of Demand for Male and Female Workers

Period	Index of Demand		Geographic Structural Unemployment		Geographic Structural Unemployment as a Proportion Total	
	Male V(m)÷U(m)	Female V(f)÷U(f)	Male Ugs(m)	Female Ugs(f)	Male %	Female %
Dec. 1972	0.43	0.49	365	365	9.8	39.8
June 1973	0.90	0.83	433	437	12.6	25.6
Sept. 1973	2.00	2.00	499	331	39.0	59.0
June 1974	3.01	3.30	274	223	33.0	60.9

Source: Calculated from unpublished data provided by the Department of Labour

6.3 Geographical Structural Unemployment

When we turn to the measure of the geographic dimension of structural unemployment we again find a quite striking contrast between the results of males and females. That females tend to suffer more than males from geographic immobility is clearly shown in Table 6. This table examines the experience between the sexes at points in time when the pressure of demand is comparable. In each of the four periods covered the proportion of females experiencing geographical structural unemployment to total female unemployment is higher than the corresponding ratio computed for males. In addition, in June 1973, the total number of women experiencing this type of unemployment was greater than geographically unemployed males. This figure takes on particular significance when we consider that in 1973 males outnumbered females in the work force by more than 3 to 1.

Our research indicated that structural unemployment resulting from geographical factors was a greater problem for women than unemployment resulting from occupational immobility. In only four of the thirty-eight periods we examined was occupational structural unemployment more severe than geographical structural unemployment. There is also some evidence (Table 7) to suggest that this situation is deteriorating and that it may therefore be increasingly difficult to solve female unemployment by a general expansion of demand.

7. Female Geographic Structural Unemployment for Comparable Levels of Demand for Female Workers

Period	Index of Demand V(f):V(m)	Geographic Structural Unemployment Ugs(f)	Geographic Structural Unemployment as a Proportion of Total Unemployment %
March 1969	0.98	289	32.9
March 1973	0.86	311	37.5
Dec. 1971	1.07	425	39.8
Dec. 1974	1.02	301	42.5
June 1969	1.33	268	35.5
June 1971	1.31	223	42.2
Sept. 1969	1.73	201	32.1
Sept. 1973	2.01	331	59.0

Source: Calculated from unpublished data provided by the Department of Labour.

8. Frictional Unemployment: Males and Females Annual Average 1969-1978

Year	Frictional Unemployment		Frictional Unemployment as a Proportion of Total Unemployment		Index of Demand	
	Male Uf(m)	Female Uf(f)	Male %	Female %	Male V(m):U(m)	Female V(f):U(f)
1969	511	190	25.4	27.9	1.06	1.69
1970	343	131	27.0	33.8	1.77	3.53
1971	293	153	10.2	23.8	0.47	1.36
1972	498	215	11.3	15.6	0.29	0.54
1973	325	113	22.6	16.9	1.53	1.26
1974	550	63	81.0	17.0	3.74	2.67
1975	337	198	11.1	11.9	0.38	0.18
1976	421	230	13.5	9.2	0.37	0.13
1977	450	221	9.5	6.7	0.23	0.07
1978	818	365	6.4	4.0	0.08	0.04
Average 1969-1978	455	188	14.5	11.4	0.52	0.44

Source: Calculated from unpublished data provided by the Department of Labour.

The high incidence of geographic structural unemployment amongst females is understandable considering the existing social framework. A large proportion of women of working age are married. Traditionally the employment prospects of the husband are considered ahead of any other household member. If he is secure in his job it is unlikely that the family will move to an area in which the wife is able to find employment. Schemes to force families to move to locations in which the wife may find employment are both socially undesirable and of doubtful effect since there is no guarantee that the husband will be able to find employment in the new location. To overcome what is a significant problem amongst married women, policies should be implemented that will increase the employment opportunities in the areas in which the unemployed women are found.

6.4 Frictional Unemployment

Since there are no skill or geographic barriers preventing frictionally unemployed workers from obtaining a job it will be this class of unemployment that is most likely to correspond to search unemployment. Over the period of our study the annual average estimates of male frictional unemployment ranged from a low of 293 to a high of 818 (Table 8). The average of the annual figures was 455 or 14.5 percent of the average level of total male unemployment. For females the annual averages ranged from 63 to 365 giving an average level of 188 or 11.4 percent of average female unemployment throughout the period.

9. Male and Female Frictional Unemployment at Comparable Levels of Demand for Male and Female Workers

Period	Index of Demand		Frictional Unemployment		Frictional Unemployment as a Proportion of Total Unemployment	
	Male V(m)÷U(m)	Female U(f)÷U(f)	Male Uf(m)	Female Uf(f)	Male %	Female %
Dec. 1972	0.43	0.49	528	289	10.8	19.8
June 1973	0.90	0.83	385	145	15.8	43.7
Sept. 1973	2.01	2.02	242	91	18.9	43.1
June 1974	3.06	3.30	161	65	19.4	44.0

Source: Calculated from unpublished data provided by the Department of Labour.

10. A Comparison Over Time of Male and Female Frictional Unemployment

Period	Index of Demand		Frictional Unemployment		Frictional Unemployment as a Proportion of Total Unemployment	
	Male V(m):U(m)	Female V(f):U(f)	Male Uf(m)	Female Uf(f)	Male %	Female %
March 1969	1.02		591		29.4	
March 1977	0.80		506		27.9	
Dec. 1969	2.23		400		30.1	
Dec. 1974	2.20		145		18.9	
Sept. 1971	0.34		335		10.4	
Sept. 1976	0.33		295		8.6	
March 1969		0.98		173		19.7
March 1973		0.86		181		21.8
Dec. 1971		1.07		263		24.7
Dec. 1974		1.02		57		11.8
June 1969		1.33		219		28.9
June 1971		1.31		136		25.7

Source: Calculated from unpublished data provided by the Department of Labour.

Thus over the period there was some scope for unemployment to have been voluntary and the result of search activity.[11] The fact that women appear to experience more frictional unemployment than men (Table 9) may result, in terms of search theory, from the availability of non-market income which acts as a subsidy to search that men, by and large, do not have the same amount of access to.

Table 10 allows comparisons over time for the two groups to be made. Taking into account the effects of the pressure of demand it appears that the importance of frictional unemployment has declined for both groups. Thus, it is unlikely that an increase in frictional unemployment (and by implication search unemployment) is responsible for the rise in total unemployment experienced throughout the period. Nor is it likely that increased frictions (search activity) will prevent a return to historical levels of unemployment.

6.5 Types of Unemployment in the Regions

This section examines the twenty-two employment districts of New Zealand and the types of unemployment experienced by them. The analysis treats the regions as labour markets in which there is complete geographic mobility and between which there is no movement of labour. To measure types of unemployment in each region the same procedure is adopted as in analysing types of unemployment in the country as a whole. A summary of the average experience of each region is shown in Table 11. The estimate of structural unemployment for each region

11. Types of Unemployment in the Regions: Male and Female: Average Experience 1969-1978

Region	Demand-Deficient Unemployment as a Proportion of Total		Structural Unemployment as a Proportion of Total		Frictional Unemployment as a Proportion of Total	
	Male %	Female %	Male %	Female %	Male %	Female %
Whangarei	94.3	95.8	1.0	0.3	4.8	3.9
Auckland	63.4	78.6	15.9	1.6	20.8	19.8
Hamilton	66.2	82.5	16.7	3.1	17.1	14.4
Tauranga	86.9	90.0	5.4	1.6	7.8	8.5
Rotorua	78.0	88.9	5.5	0.3	16.5	10.9
Gisborne	84.1	94.4	7.5	0.8	8.4	4.8
Napier	88.6	89.4	5.8	4.9	5.7	5.7
Hastings	93.9	96.7	3.4	1.1	2.7	2.2
New Plymouth	74.4	87.1	18.0	7.1	7.6	5.8
Wanganui	90.2	92.3	4.6	2.1	5.2	5.6
Palmerston N.	75.0	79.9	14.4	5.0	10.6	15.0
Masterton	95.0	93.2	2.3	2.3	2.7	4.4
Lower Hutt	26.7	64.0	39.9	6.7	33.3	29.3
Wellington	39.7	53.5	32.0	11.9	28.4	34.6
Blenheim	84.6	88.9	7.5	2.3	7.9	8.8
Nelson	75.5	84.0	13.8	5.9	10.7	10.2
Greymouth	66.5	71.7	14.7	11.6	18.8	16.7
Christchurch	80.5	90.5	10.1	2.2	9.4	7.3
Timaru	90.5	96.3	7.8	1.9	1.7	1.8
Dunedin	74.2	77.0	12.7	5.6	13.1	17.4
Invercargill	81.7	89.5	12.9	2.0	5.4	8.6
Murchison	87.9	95.8	5.1	0.2	7.0	4.0

Source: Calculated from unpublished data provided by the Department of Labour.

may be overstated because some of the unemployed classified as structural could possibly move to vacancies in other regions. On the other hand, structural unemployment may be understated because of the assumption of complete geographic mobility within regions. However, a more important problem in comparing the regions is that the proportional importance of each type of unemployment in each region is not independent of the average pressure of demand experienced by the regions. Consequently, in order to discover if structural unemployment, for example, is more of a problem in one region than another, the calculations must be appropriately adjusted.

Thirlwall (1969) proposes two ways of doing this. First, one could simply find years when the pressure of demand was the same in each region and compare the percentage of structural unemployment on this basis. Unfortunately, the New Zealand statistics do not provide a period in which this requirement comes even close to being met. Thirlwall's second approach is to adjust each regions structural unemployment by the extent to which its pressure of demand has fallen short of, or exceeded, the average pressure of demand for all regions. The adjustment factor is based on the regression co-efficient relating the percentage of structural unemployment in each region to the index of demand.

12. Structural Unemployment as a Proportion of Total Unemployment in the Regions Adjusted for Differences in the Pressure of Demand. (Male)

Region	Structural Unemployment %
Whangarei	4.9
Auckland	18.1
Hamilton	15.6
Tauranga	8.5
Rotorua	8.1
Gisborne	10.7
Napier	7.0
Hastings	7.2
New Plymouth	17.1
Wanganui	10.3
Palmerston North	16.3
Masterton	5.5
Lower Hutt	7.4
Wellington	16.4
Blenheim	10.6
Nelson	15.7
Greymouth	16.2
Christchurch	12.0
Timaru	11.2
Dunedin	14.1
Invercargill	15.0
Murchison	8.6

Source: Calculated from unpublished data provided by the Department of Labour

13. Male Structural Unemployment in Auckland at Comparable Levels of Demand

Period	Index of Demand	Structural Unemployment (Male) Uos(m)	Structural Unemployment (Male) as a Proportion of Total Unemployment %
March 1972	0.49	258	31.1
March 1975	0.46	148	23.6
March 1976	0.44	119	17.9

Source: Calculated from unpublished data provided by the Department of Labour

The result of this exercise, for male structural unemployment,[12] is found in Table 12. From this table we gain an idea of the regions in which programmes to retrain workers are likely to be of importance. It appears that some centres are more prone to structural problems than others. Efforts to expand demand and create new jobs may lead to bottleneck problems, and hence inflation, in areas such as Auckland, Greymouth and Palmerston North before demand in other regions has been raised sufficiently to solve their unemployment problems. This finding suggests that the focus of policy, if interregional unemployment rate discrepancies are to be narrowed, must be on policies to expand demand in the depressed regions while insulating the rest of the economy from their effects. This conclusion however, should be modified in the light of Table 13 which examines Auckland's structural unemployment at comparable levels of demand.[13] It appears that structural unemployment, and hence the structural problem, has become less important since the early 1970s. This being the case, traditional levels of unemployment should now be more easily reached than in the past through a general expansion of demand. This will be so despite the fact that Auckland will be amongst the first areas to experience a shortage of labour.

7. CONCLUSION

In this chapter we have considered two methods of calculating unemployment types and have chosen the "causal" method for use in our detailed analysis of the New Zealand experience. Because we decided that the experience of females should be examined separately from that of males we were restricted to the use of data prior to 1979. The analysis was confronted with a number of problems not the least of which was the realibility of the data used. Despite the fact that we expect the data to be deficient in many respects we decided to proceed with the analysis for three reasons. First, the recorded data of the Department of Labour is the most reliable information available on both the occupational and regional breakdown of unemployment and vacancy statistics. Second, the direction of any error arising from the incorrect recording of the data is, with one exception, known and can therefore be allowed for. Finally, in an analysis of this kind we are more interested in the relative relationships over time between the various unemployment types than in a precise estimate of the number in any group at a particular point in time.[14]

The empirical work has uncovered a number of important findings on the operation of the New Zealand labour market. There is, for example, a significant difference between the unemployment experience of male and female workers. Female workers appear to be the first affected by economic downturns as evidenced in the rapidly rising figures of demand-deficient unemployment amongst this group from the mid 1970s. Female workers are also less mobile geographically than their male counterparts but do not suffer to anywhere near the same extent from occupational immobility.

However,the most interesting findings are those that have a bearing on search theory as a explanation for unemployment. Frictional unemployment, and to a lesser extent structural unemployment, are the two classes of unemployment from which voluntary (search) unemployment might arise. Both types have accounted for a significant proportion of unemployment over the period studied. However,this has always been at times when unemployment, in total,was low. In recent periods, when total unemployment has been quite high, the scope for a person to be voluntary unemployed, in the sense that there is a job available for him, has been greatly reduced. Indeed by 1981 only 7.6 percent of the unemployed were in the non-demand-deficient category.[15]

The evidence with respect to both frictional unemployment and occupational structural unemployment suggests, if anything, a decline in the porportion of unemployed workers in these categories, at a given level of demand, over time. This implies that changes in labour market frictions, such as increased search, have neither been responsible for the increase in unemployment in the late 1970s nor will prevent a return to the historically low levels of unemployment in the future.

NOTES

1. Research reported in this chapter was utilized in Hicks (1980).

2. See Kalachek and Knowles (1961), Heller (1964) and Gordon (1964).

3. See for example Thurow (1965).

4. Thus

$$Uos = \sum_{i = n+1}^{T} (V_i - U_i)$$

provided

$$\sum_{i = n+1}^{T} (V_i - U_i) < \sum_{i = 1}^{n} (U_i - V_i)$$

where Uos is occupational structural unemployment,

T is the total number of occupations,

n is the number of occupations in which $U_i > V_i$,

U_i is the registered unemployment in occupation i,

V_i is the registered vacancies in occupation i.

5. Thus

$$Uos = \sum_{i = 1}^{n} (U_i - V_i)$$

provided

$$\sum_{i = n+1}^{T} (V_i - U_i) > \sum_{i = 1}^{n} (U_i - V_i)$$

6. $$Ugs = \sum_{n} \sum_{irm} (V_{ir} - U_{ir}) + \sum_{m} \sum_{irn} (U_{ir} - V_{ir})$$

where Ugs is geographical structural unemployment

n is the number of occupations in which $U_i > V_i$,

m is the number of occupations in which $V_i > U_i$,

irm is the number of regions in which $V_{ir} > U_{ir}$ (when $U_i > V_i$),

irn is the number of regions in which $U_{ir} > V_{ir}$ (when $V_i > U_i$).

7. Armstrong and Taylor (1981) argue for an additional category of structural unemployment which they call the occupational/geographical component. This is given by unemployment due to the simultaneous existence of a geographical and an occupational mis-match between demand for and supply of labour. In terms of our analysis it may be found by disaggregating Uos into the component that would need to be relocated once retrained and those who would not. The numerical importance of this group in the empirical results of Armstrong and Taylor was small. We therefore do not make the distinction.

8. Dow and Dicks-Mireaux (1958) state that a common sense way of measuring the strength of demand for labour is to subtract unemployment from unfilled vacancies. This technique has been

used by a number of writers. See for example Hanson (1970). However V/U, as used by Jacobson and Lindbeck (1969) is a more appropriate measure for the purpose at hand.

9. After 1978 no data is avialable by sex for registered vacancies.

10. See for example Niland (1975).

11. If all frictions could have been removed the level of unemployment over the period would have fallen by less than 20 percent on average.

12. From Table 11 we can see that structural unemployment among females is again of little importance. As a result we do not adjust for demand in this case.

13. An examination of Greymouth, Palmerston North, and New Plymouth produced similar results to those of Auckland. Auckland alone is reported because of its greater importance as an area of unemployment. It is also the area which, allowing for demand, may be expected to have the highest percentage of structural unemployment.

14. To the extent that measurement error varies over time our relativity argument will be weakened.

15. See Department of Labour (1982).

CHAPTER 9

THE RELATIONSHIP BETWEEN UNEMPLOYMENT AND VACANCIES IN NEW ZEALAND[1]

1. INTRODUCTION

The relationship between unemployment and vacancies (henceforth the UV relationship), and the occurence of shifts in this relationship, have received close attention in a number of countries in recent years as an explanation of the current rise in unemployment.[2] New Zealand, however, is an exception. Although Woodfield (1975) utilized New Zealand data, his concern was to demonstrate that the use of registered vacancy figures in estimating the UV relationship might result in an underestimate of structural unemployment. He was not concerned with estimating the precise quantitative form of the relationship, or with testing for shifts in the relationship. In this chapter we will attempt to find an acceptable form of the UV relationship for the New Zealand case and to test its stability over time.

The format of the chapter is as follows. Section 2 reviews the theoretical analysis of Chapter 4 as an underpinning for our empirical work. Section 3 examines the observed pattern of the UV relationship over time and estimates static econometric models of the relationship testing for shifts. Section 4 analyses the data in models of a dynamic

FIGURE A: The Search Model and the Relationship between Unemployment and Vacancies.

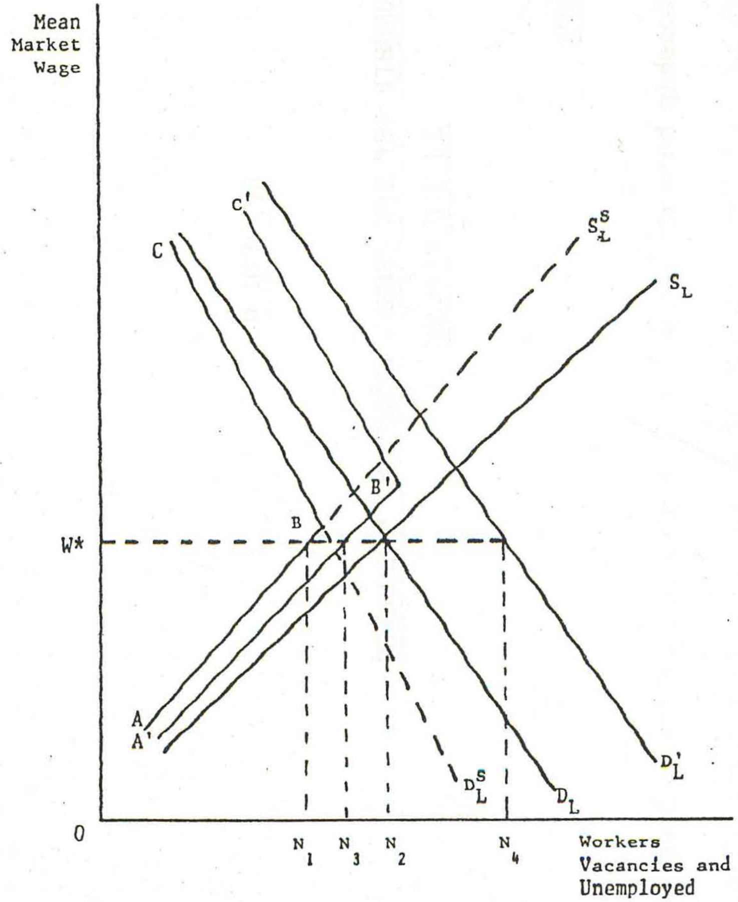
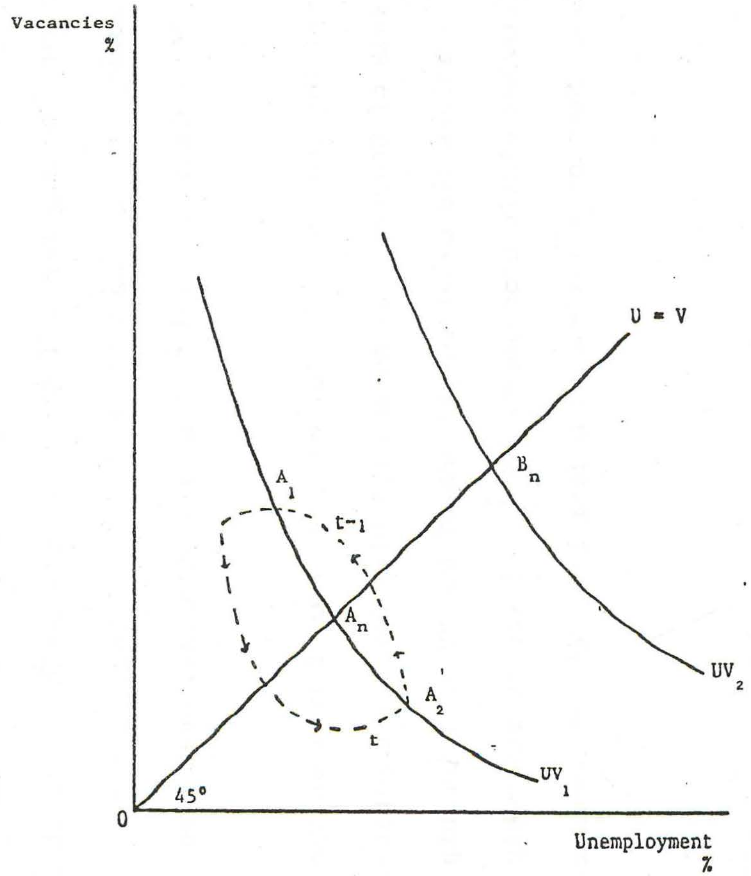


FIGURE B The Steady-State UV Curve



structure which also enable us to avoid problems of specification. Section 5 attempts to explain why shifts in the relationship have occured. Section 6 concludes.

2. REVIEW OF THE THEORY

Chapter 4 explained the existence of a long-run, steady-state relationship between unemployment and vacancies in terms of the modified version of the search model as depicted in Figure A. S_L^s and D_L^s are to the left of S_L and D_L respecively because of the existence of labour market frictions. ABC represents the economy's "employment" curve. At a wage of W*, employment is N_1 whilst both demand for and supply of labour is N_2. Thus, in equilibrium, vacancies equal unemployment. The steady-state UV curve in Figure B, UV_1, can be traced out by reference to either changes in the wage rate, demand for labour held constant, or, preferably, changes in the demand for labour, wages held constant. In the latter case an increase in the demand for labour would shift both D_L and D_L^s to the right and, because a given reservation wage is now more readily obtained, shift S_L^s closer to S_L. The net result, at a fixed wage, would be to produce the curve A'B'C' in Figure A. Unemployment will have fallen to N_3N_2 and vacancies have risen to N_3N_4. In Figure B this would be equivalent to a move from point A_n on UV_1 to A_1. A similar analysis can be used to demonstrate that a reduction in demand will result in a movement from A_n to A_2 given a fixed wage rate.

Of course wages will not remain fixed and, as we saw in Chapter 4, the consequence of allowing the wage rate to vary will be to trace out an adjustment path for the economy, in terms of unemployment and vacancies, that takes the form indicated by the dotted line in Figure B over the course of the cycle. We also demonstrated in Chapter 4 that in the absence of further cyclical changes, the level of vacancies and unemployment will tend to adjust to the combination found at point A_n in Figure B. The amount of unemployment and vacancies existing at point A_n is determined by the distance between the employment curve, ABC, and S_L and D_L in the initial equilibrium in Figure A. Three factors may alter this equilibrium position: (a) a shift in the relationship between D_L^s and D_L, (b) a shift in the relationship between S_L^s and S_L and (c) a shift of S_L. Following any of these changes a curve such as UV_2, with an equilibrium combination of vacancies and unemployment at B_n, may be generated.

The empirical analysis of this chapter therefore falls neatly into three parts. First we must both formulate and estimate an acceptable form of the UV relationship for the New Zealand economy. Second we must determine whether or not shifts in this relationship have occured. Finally if shifts are found, we must test to see which of the above factors have been responsible. With reference to the last of these tasks, we are particularly interested in the

FIGURE C Quarterly Registered Unemployment and Registered Vacancies: New Zealand, 1960 (I) to 1981 (IV).

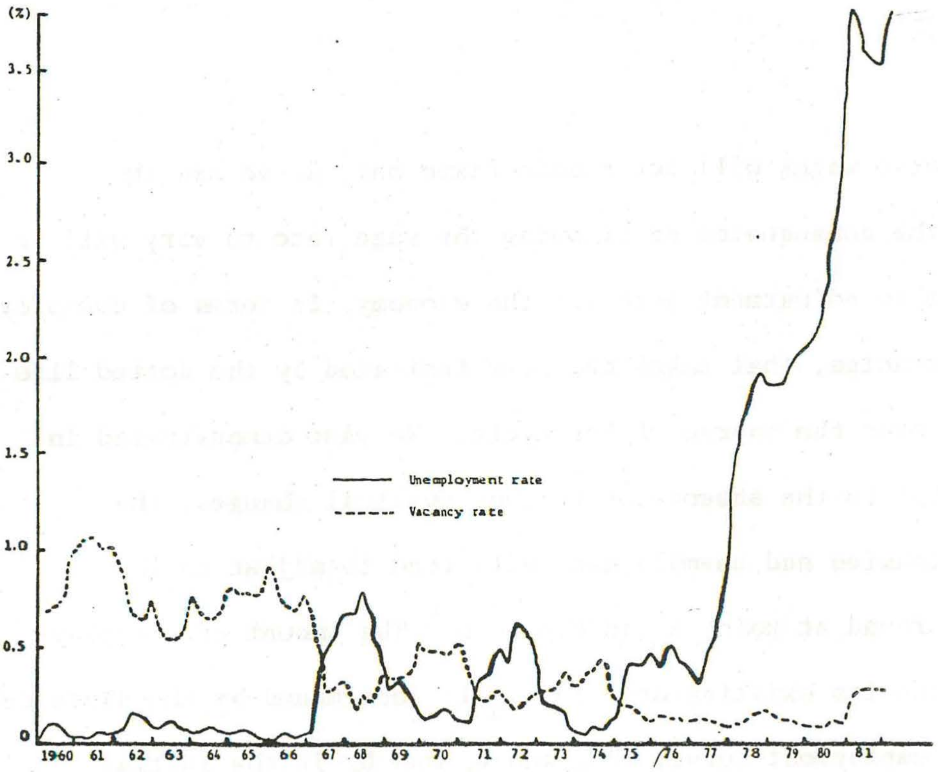
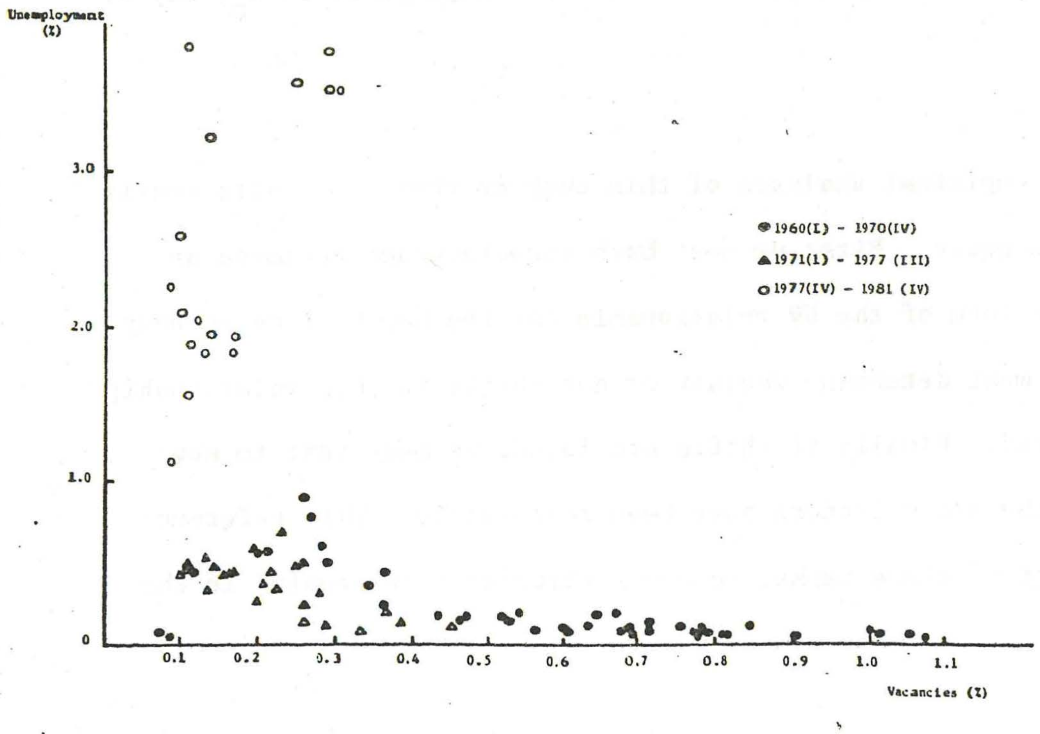


FIGURE D The UV Scatter for New Zealand, 1960 (I) to 1981 (IV)



extent to which our findings can be used to support the hypothesis that recent rises in the level of unemployment are due to changed search activity by workers. To repeat what we have already covered in Chapter 4, a search explanation of a shift in the UV curve is just one of a number of possibilities. However, failure to find any shift of the UV curve would severely weaken the claim that increased unemployment results from increased search activity.

3. SIMPLE FUNCTIONAL FORMS AND THE OBSERVED UV RELATION 1960-1981

Unemployment and vacancies are two labour market indicators, the former is related to the supply side of the market and the latter to the demand side. Because of their nature it is reasonable to assume that they will move in opposite directions. The plot of the registered unemployment rate and the registered vacancy rate over the period 1960 (I) to 1981 (IV) in Figure C conforms to this expectation.[3] Not only did these indicators move as expected but for most of the period they were almost images of one another. However, beginning about the third quarter of 1977 this pattern became somewhat distorted as the unemployment rate rose relative to what one would expect on the basis of vacancies. This shift is also highlighted in Figure D which presents the UV scatter for our period of study. In this graph not only is a shift outward of the UV curve indicated after 1977 (III) but a small inward shift in the relationship appears to

1. Simple Functional Forms of the UV Relation: Registered Quarterly Data

Functional Form No.	Constant	Log VR	1/VR	$\sqrt{VR}$	Δ log VR	S_1	S_2	S_3	$\bar{R}^2$	D.W.
3.1	-3.090 (-14.944)	-1.572 (-13.904)				-0.236 (-1.011)	0.107 (0.458)	0.092 (0.393)	0.690	0.264
3.2	-0.019 (-0.083)		0.185 (5.767)			-0.138 (-0.536)	-0.061 (-0.237)	0.021 (0.081)	0.255	0.100
3.3	-0.062 (-0.271)	-0.739 (-5.949)				-0.188 (-0.735)	-0.125 (-0.488)	-0.062 (-0.244)	0.269	0.066
3.4	1.662 (12.088)			-1.576 (-8.671)		-0.108 (-0.979)	-0.044 (-0.395)	-0.032 (-0.295)	0.454	0.086
3.5	0.086 (1.074)				-0.584 (-3.778)	0.217 (1.929)	-0.147 (-1.314)	-0.194 (-1.741)	0.366	2.228

NOTE: Numbers in parentheses beneath coefficients refer to t values.
Degrees of freedom = 80.

have taken place after 1970 (IV). Gallacher (1975) noted this tendency for the UV scatter to swing closer to the origin and tentatively suggested that through time the degree of maladjustment had become less.

Five different functional forms were fitted to the data using standard Ordinary Least Squares regression techniques. The functions were

$$\log UR_t = a + b \log VR_t \qquad (3.1)$$

$$UR_t = a + b/VR_t \qquad (3.2)$$

$$UR_t = a + b \log VR_t \qquad (3.3)$$

$$\sqrt{UR}_t = a + b \sqrt{VR}_t \qquad (3.4)$$

$$\Delta\log UR_t = a + b \,\Delta\log VR_t \qquad (3.5)$$

where UR = registered unemployment rate,

VR = registered vacancy rate and

$\Delta\log UR_t = \log UR_t - \log UR_{t-1}$

Equation (3.1) was the form adopted by Gujarati (1972) and repeated by a number of subsequent investigators.[4] Equation (3.2) was utilized by Holmlund (1975) in his study with Swedish data. Equations (3.3) and (3.4) were suggested by the work of Harper (1980), the latter being based on the work of Muellbauer (1978). Equation (3.5) has previously been used by Evans (1975). The results of the regressions are presented in Table 1. As the quarterly data had not been seasonally adjusted, seasonal dummies (s) are employed.

2. Testing for Shifts in the Simple Functional Forms of the UV Relation: Registered Quarterly Data

Functional Form No.	Constant	Log UR	1/UR	$\sqrt{VR}$	Δ Log VR	T	SHD	S_1	S_2	S_3	$\bar{R}^2$	D.W.
3.1	-3.378 (-16.325)	-0.901 (-4.338)				0.022 (3.754)		-0.170 (-0.782)	0.206 (0.941)	0.128 (0.590)	0.732	0.209
3.2	-0.532 (-2.630)		-0.035 (-0.812)			0.031 (6.424)		-0.106 (-0.499)	-0.005 (-0.021)	-0.028 (-0.134)	0.499	0.058
3.3	-0.549 (-2.768)	0.400 (2.008)				0.038 (6.632)		-0.077 (-0.368)	0.042 (0.200)	-0.001 (-0.003)	0.518	0.087
3.4	-0.022 (-0.069)			-0.004 (-0.013)		0.015 (5.838)		-0.049 (-0.518)	0.042 (0.443)	0.016 (0.169)	0.610	0.084
3.5	-0.018 (-0.168)				-1.092 (-3.814)	0.001 (0.902)		0.257 (2.298)	-0.101 (-0.888)	-0.150 (-1.332)	0.280	2.240
3.1	-2.938 (-20.279)	-1.099 (-11.772)					1.578 (8.911)	-0.163 (-1.001)	0.219 (1.344)	0.176 (1.080)	0.850	0.452
3.2	0.232 (2.049)		-0.002 (-0.084)				2.263 (15.983)	-0.086 (-0.673)	0.037 (0.289)	0.057 (0.442)	0.817	0.304
3.3	0.140 (1.244)	-0.111 (-1.529)					2.160 (16.087)	-0.091 (-0.721)	0.023 (0.184)	0.049 (0.388)	0.822	0.292
3.4	0.930 (12.08)			-0.736 (-7.523)			0.920 (17.270)	-0.059 (-1.143)	0.028 (0.531)	0.027 (0.521)	0.889	0.370
3.5	-0.134 (-1.652)				-0.601 (-3.878)		0.113 (1.136)	0.198 (1.777)	0.415 (3.723)	0.053 (0.480)	0.284	2.278

NOTE: Numbers in parantheses beneath coefficients refer to t values.
Degrees of freedom = 79.

These results suggested that none of the simple functional forms considered can be regarded as a well-specified estimate of the true UV relationship for New Zealand over the period of our study. The $\overline{R}^2$ is low in all cases, with the possible exception of equation (3.1), and all equations exhibit autocorrelation. Gujarati (1973) did not seem particularly concerned about the presence of autocorrelation in his original paper (Gujarati 1972) and defended the thrust of his findings - that there had been an outward shift in the UV curve for the United Kingdom following the Redundancy Payments Act (1965) and the National Insurance Act (1966).

Although we are not convinced by Gujarati's argument we will ignore the problem of autocorrelation for the time being and test for an outward shift in the UV curve from the third quarter of 1977 which was suggested by the evidence in Figure D. Three tests are employed. The first is to include a time trend (T) (Evans 1975). The second is to include a shift variable (SHD) for the period after 1977 (III). This procedure was originally adopted by Driehuis (1978). The results of these two tests for each of our simple functional forms is reported in Table 2. Apart from equation (3.5) the results indicate that a shift has taken place in the (albeit poorly estimated) relationship. The third test is similar to that employed by Gujarati (1972). The relationship between the vacancy rate and the unemployment rate is re-estimated for the period 1960 (I) to 1977 (III) using equation (3.1). We then use the equation to

3. Actual and Predicted Values of UR 1977 (IV) to 1981 (IV)

Period		Values of UR (%) Actual	Predicted[a]
1977	IV	1.24	0.95
1978	I	1.55	0.61
	II	1.88	0.92
	III	1.93	0.48
	IV	1.83	0.43
1979	I	1.83	0.50
	II	1.95	0.68
	III	2.05	0.75
	IV	2.10	0.83
1980	I	2.22	0.70
	II	2.58	1.04
	III	3.25	0.62
	IV	3.81	0.74
1981	I	3.58	0.22
	II	3.54	0.28
	III	3.53	0.24
	IV	3.79	0.22

[a] Based on the regression

$$\text{Log UR} = \underset{(-9.772)}{-2.289} \; \underset{(-13.491)}{-1.909} \log \text{VR} \; \underset{(-1.114)}{-0.188}\, S_1 \; \underset{(1.348)}{+\,0.228}\, S_2 \; \underset{(0.719)}{+\,0.122}\, S_3$$

$\bar{R}^2 = 0.733$ D.W. = 0.427 D.F. = 66 predict UR in each quarter since 1977 (III) and compare the results with the actual UR values. This is done in Table 3. The predicted results give the values of UR that "ought" to have prevailed since 1977 (IV) if the relationship between unemployment and vacancies observed during 1960 (I) to 1977 (III) had continued. The relationship of predicted UR to actual UR therefore gives some indication of the shift that has taken place in the relationship.

Apart from the problem of autocorrelation evident in the above analyses the form of the estimating equations are themselves subject to the criticism of being incorrectly specified.[5] Of particular importance, from the point of view of the theory developed in Chapter 4, is the fact that no allowance has been made for the impact on the relationship of the dynamic response to the various stages of the trade cycle. According to the dynamic theoretical consideration of Chapter 4, which concurs with the findings of slightly different versions of the dynamic UV relationship provided by Phelps (1968), Hansen (1970) and Holt and David (1966), a simple short-run relation between the unemployment rate and the vacancy rate does not exist. Although in the long run the relationship between the unemployment rate and the vacancy rate settles down to a unique form, in the short run the position of the UV curve shifts in accordance with cyclical movements in the level of economic activity. This fact must be incorporated into our attempts to correctly specify and estimate the UV relationship for New Zealand.

4. Simple Functional Forms of the Dynamic UV Relation: Registered Quarterly Data

Functional Form	Constant	Log VR	Log UR	Log UR_{t-1}	Δ Log UR	1/UR	$\frac{UR}{UR}$	Log $\frac{UR_{t-1}}{UR}$	S_1	S_2	S_3	$\bar{R}^2$	D.W.
4.1	-0.671 (-4.407)	-0.325 (-4.045)		0.847 (19.501)					0.009 (0.088)	0.515 (5.091)	0.026 (0.263)	0.945	1.347
4.2	-3.103 (-14.462)	-1.579 (-13.573)			-0.042 (-0.192)				-0.238 (-0.979)	0.126 (0.491)	0.093 (0.392)	0.684	0.271
4.3	0.162 (5.117)					0.031 (17.900)	0.002 (0.211)		-0.037 (-0.905)	0.052 (1.311)	0.032 (0.814)	0.789	0.639
4.4	-1.708 (-17.339)		-0.444 (-13.639)					0.270 (0.289)	-0.010 (-0.794)	0.034 (0.259)	0.035 (0.278)	0.682	0.315

NOTE: Numbers in parentheses beneath coefficients refer to t values.
Degrees of Freedom = 79.

4. TESTS OF THE DYNAMIC UV RELATIONSHIP

A number of simple functional forms attempting to capture the cyclical impact on the UV relationship were tried. They were

$$\log UR_t = a + b \log VR_t + c \log UR_{t-1} \qquad (4.1)$$

$$\log UR_t = a + b \log VR_t + c \, \Delta\log UR_t \qquad (4.2)$$

$$VR_t = a + b/UR_t + c \, \dot{UR}_t/UR_t \qquad (4.3)$$

$$\log VR_t = a + b \log UR_t + c \log UR_{t+1}/UR_t \qquad (4.4)$$

where $\dot{UR}_t/UR_t = UR_{t+1} - UR_{t-1}/2 \; UR_t$

Equation (4.1) was used by Foster (1973). Equation (4.2) is a variant on (4.1). Equations (4.3) and (4.4) were suggested by the work of Holmlund (1975). For the first two equations, a positive value for the c coefficient implies that rising unemployment means a higher level of unemployment for a given level of vacancies. In the second two equations a negative c coefficient implies that rising unemployment means a lower vacancy rate - at a given unemployment rate - than falling unemployment.

Our findings, reported in Table 4, are marginally more successful than our attempts with the simple static form of the UV model. Only in equation (4.1) is the coefficient for the variable for cyclical change of the correct sign and significantly different from zero. Even with equation (4.1) however, autocorrelation remains a

5. Shifts in the Simple Dynamic UV Relation: Registered Quarterly Data

Functional Form No.	Constant	Log VR	Log UR	Log UR_{t-1}	ΔLog UR	1/UR	$\frac{UR}{UR}$	Log $UR_{\frac{t+1}{U}}$	T	SHD	S_1	S_2	S_3	$\bar{R}^2$	D.W.
4.1	-0.672	-0.324		0.847					0.000		0.009	0.515	0.026	0.944	1.346
	(-3.662)	(-3.212)		(17.457)					(0.011)		(0.088)	(5.057)	(0.261)		
4.2	-3.373	-0.874			0.045				0.024		-0.209	0.189	0.129	0.730	0.207
	(-16.027)	(-4.104)			(0.221)				(3.840)		(-0.930)	(0.790)	(0.589)		
4.3	0.485					0.019	0.001		-0.005		-0.046	0.004	0.001	0.888	0.716
	(10.995)					(11.159)	(0.218)		(-8.586)		(-1.556)	(0.123)	(0.016)		
4.4	-0.672		-0.205					0.035			-0.088	-0.050	-0.010	0.777	0.443
	(-3.505)		(-4.254)					(0.448)			(-0.838)	(-0.455)	(-0.099)		
4.1	-0.983	-0.379		0.724						0.440	0.008	0.485	0.058	0.950	1.326
	(-5.679)	(-4.877)		(12.919)						(3.248)	(0.083)	(5.054)	(0.619)		
4.2	-2.949	-1.105			-0.039					1.629	-0.103	0.237	0.176	0.847	0.464
	(-19.626)	(-11.554)			(-0.254)					(9.335)	(-0.962)	(1.319)	(1.073)		
4.3	0.181					0.030	0.002			-0.044	-0.038	0.047	0.028	0.789	0.620
	(5.053)					(15.517)	(0.193)			(-1.117)	(-0.940)	(1.171)	(0.701)		
4.4	-2.007		-0.571					0.020		0.562	-0.106	0.086	0.076	0.717	0.412
	(-15.480)		(-11.610)					(0.227)		(3.309)	(-0.889)	(0.696)	(0.641)		

NOTE: Numbers in parantheses beneath coefficients refer to t valued.
Degrees of freedom = 78.

problem. In Table 5, we again test for a shift in the UV relation from 1977 (IV) utilizing equations (4.1) to (4.4). Again a shift does appear to have taken place.

Of the functional forms so far considered, equation (4.1) appears to have performed the best. That the level of unemployment will in part be determined by the level of unemployment in the previous period is in keeping with our theoretical model. However there is no reason why the lagged effect of unemployment should be confined to one period. Similarly, there is reason to believe that the level of unemployment in any period will be related to vacancies in previous periods as vacancies also reflect cyclical conditions. Hence, a more sophisticated lag structure may be introduced in order to capture the differential responses of the vacancy rate and the unemployment rate to changes in the level of aggregate demand.[6]

By including four lags each of UR_t and VR_t as independent variables in a simple log-linear regression of the form of equation (4.1) we discovered that lags greater than one period on either UR_t or VR_t did not improve our results. After a number of tests we therefore settled on the following as our preferred equation.

$$\log UR_t = \underset{(-2.689)}{-0.447} - \underset{(-4.631)}{0.663} \log VR_t + \underset{(2.804)}{0.458} \log VR_{t-1}$$

$$+ \underset{(19.059)}{0.914} \log UR_{t-1} + \underset{(0.020)}{0.002} S_1 + \underset{(5.156)}{0.501} S_2 + \underset{(0.408)}{0.039} S_3 \qquad (4.5)$$

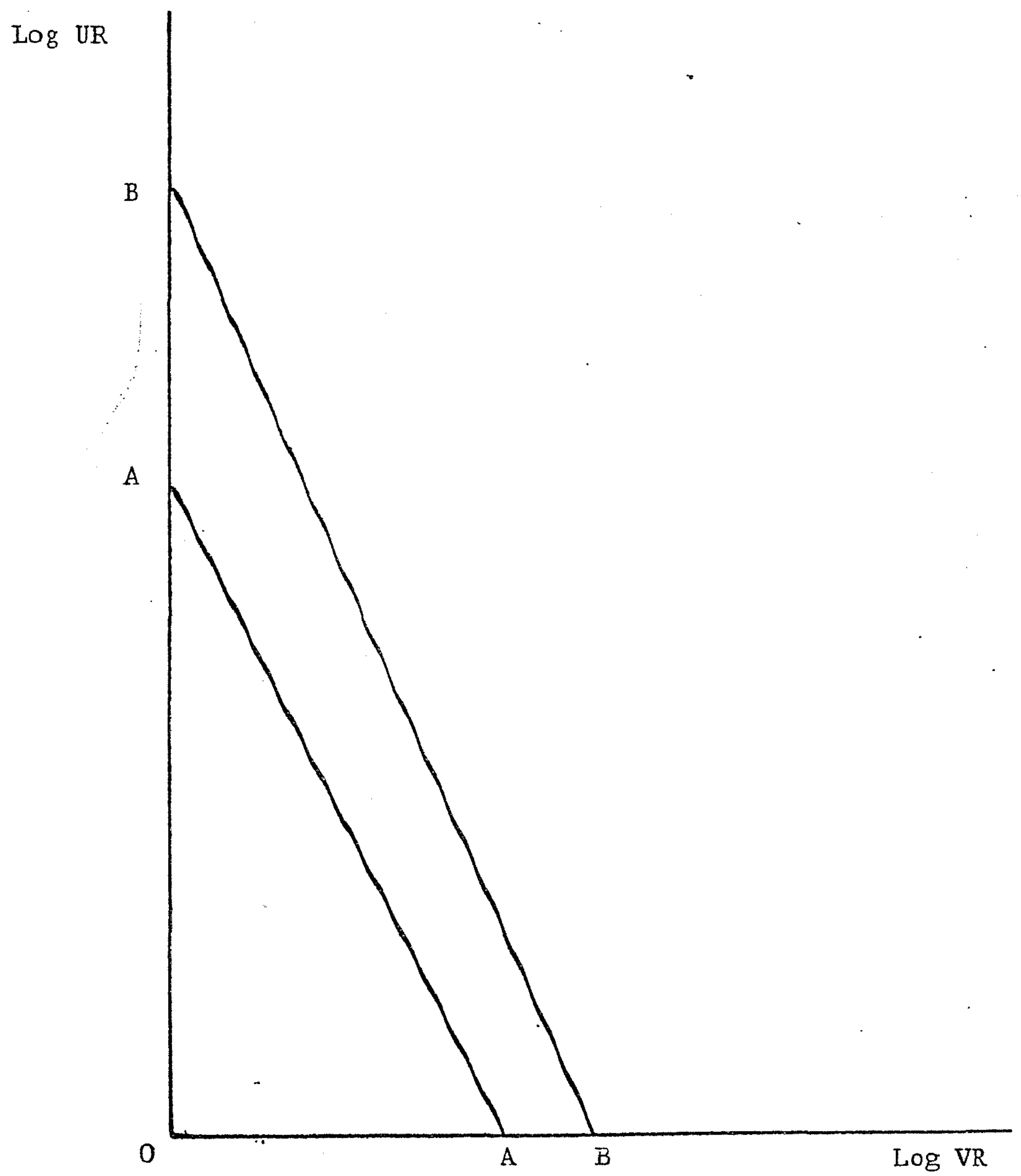
$\bar{R}^2 = 0.949$ D.W. = 1.719 h = 1.185 DF = 80

where h is Durbin's test for autocorrelation when lagged dependent variables are present as regressors.

The equation has a high explanatory value and the problem of autocorrelation, although still present, has been substantially reduced. The structure of this equation is clearly superior to previous forms as it captures the lagged response of the unemployment and vacancy rates to cyclical fluctuations.[7] We believe therefore that we have arrived at an equation which reliably depicts the UV relationship in New Zealand over the period 1960 (I) to 1981 (IV). It is an equation that describes a UV curve which is mobile about its long-run steady-state position over time, its exact location at any point in time being dependent upon the position of the economy in terms of the cycle of economic activity.

Given our belief that equation (4.5) yields a satisfactory fit to our data, the task remaining is to test for the existence of structural instability. As with our simple forms of the UV relationship, we test for an outward shift of the curve after 1977 (III).

FIGURE E Shift of the UV Curve After 1977 (IV)



We proceed by incorporating two dummy variables into (4.5). The first, SHA_1, is designed to detect constant parallel shifts in the equation. The second, SHB_1, is an attempt to capture the effect of changes in the value of the coefficient of log VR_t. Both switch at 1977 (IV). The results of the regression are as follows.

$$\text{Log } UR_t = \underset{(-4.666)}{-0.965} - \underset{(-5.424)}{0.749} \text{ Log } VR_t + \underset{(2.483)}{0.378} \text{ Log } VR_{t-1}$$

$$+ \underset{(11.030)}{0.725} \text{ Log } UR_{t-1} - \underset{(-0.308)}{0.028} S_1 + \underset{(4.835)}{0.443} S_2$$

$$+ \underset{(0.414)}{0.036} S_2 + \underset{(2.992)}{1.395} SHA_1 + \underset{(2.214)}{0.479} SHB_1 \qquad (4.6)$$

$$\bar{R}^2 = 0.956 \quad D.W. = 1.645 \quad h = 1.331 \quad D.F. = 78$$

Equation (4.6) substantiates our earlier finding that an outward shift in the UV curve had taken place after 1977 (III). Diagramatically the shift would be of the form depicted in Figure E where the curve moves from a postition such as AA to that represented by BB.

It was earlier noted that an inward shift of the New Zealand UV relationship could be observed after 1970 (IV). Our next step then, is to test the stability of our estimated relationship over this period. To do so we incorporate an additional two dummy variables into equation (4.6), SHA_2 and SHB_2, which are similar in nature

FIGURE F Shift of the UV Curve After 1971 (I)

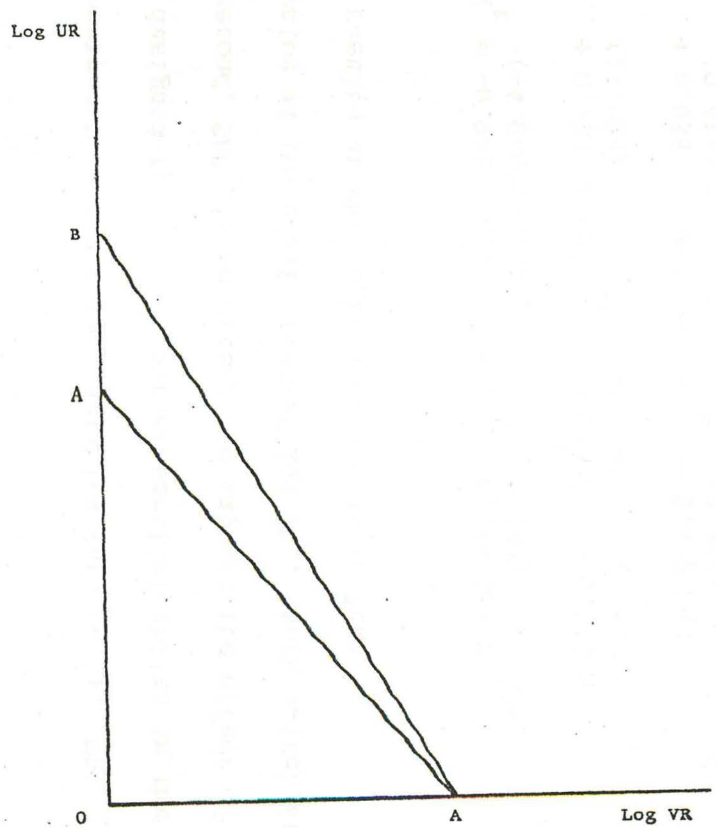
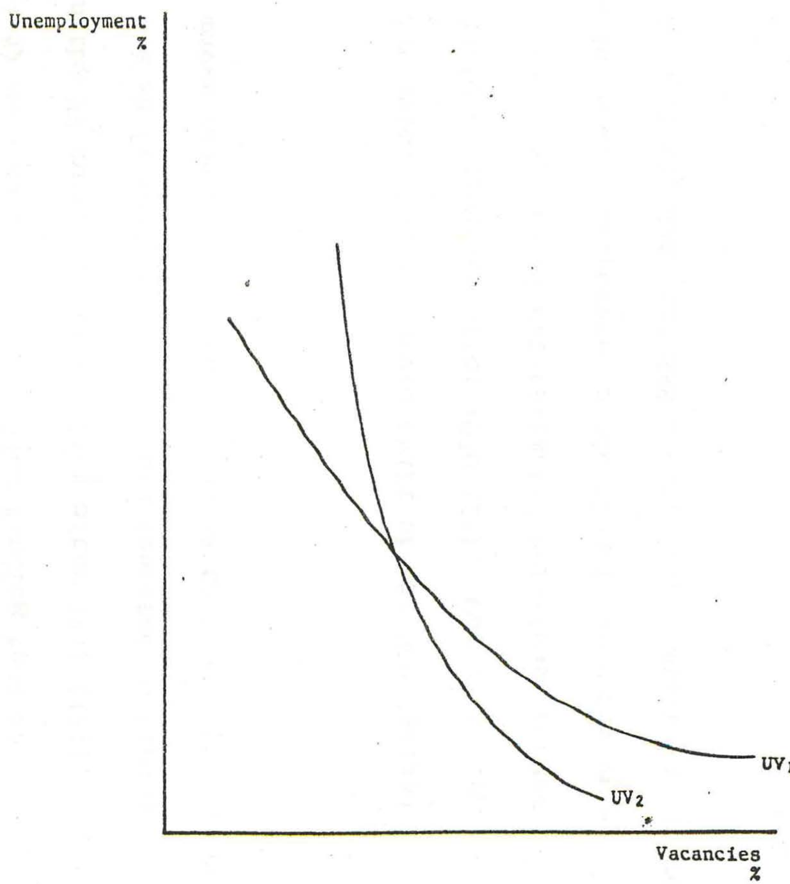


FIGURE G Impact of the 1971 (I) Shift of the UV Curve



to our first set of dummy variables but, in this case, they switch at 1971 (I) and switch back at 1977 (IV). The results are recorded in equation (4.7).

$$\begin{aligned}\text{Log } UR_t = {} & -1.444 \underset{(-6.653)}{-1.066} \text{ Log } VR_t \underset{(1.411)}{+0.213} \text{ Log } VR_{t-1} \\ & \underset{(8.224)}{+0.593} \text{ Log } UR_{t-1} \underset{(-0.747)}{-0.064} S_1 \underset{(4.249)}{+0.375} S_2 \\ & \underset{(-0.017)}{-0.001} S_3 \underset{(4.365)}{+2.108} SHA_1 \underset{(0.234)}{+0.052} SHA_2 \\ & \underset{(3.999)}{+1.023} SHB_1 \underset{(2.004)}{+0.339} SHB_2 \end{aligned} \qquad (4.7)$$

$\bar{R}^2 = 0.962$ D.W. $= 1.553$ $h = 1.564$ DF $= 76$

Equation (4.7) indicates that there was no inward parallel shift of the New Zealand UV relationship after 1970 (IV). It does, however, show that changes occuring at this time altered the value of the coefficient for log VR_t. This effect is depicted in Figure F by the movement of the curve AA to AB. The effect of this change on the conventional UV curve is presented in Figure G as a movement from the curve UV_1 to UV_2. This shift is able to explain the observations between 1971 (I) and 1977 (IV).

Thus the evidence would seem to suggest that there has been structural shifts in the relationship between unemployment and vacancies during 1971 and 1977. Although the former seems to have been a shift in the coefficient of Log VR_t only, the latter clearly appears to have occured in both this coefficient and the constant term to produce an outward movement of the UV curve.

5. THE CAUSE OF STRUCTURAL INSTABILITY IN THE OBSERVED UV RELATION

The theoretical analysis of Chapter 4 suggests a number of possible causes of shifts in the UV relation. In essence they can be divided into three main types; shifts of the supply curve, changes in demand-side "frictions" and changes in supply-side "frictions". Within the last category of causes would be included factors leading to a change in the search activity of individuals. Perhaps the most thoroughly investigated of these is changes in unemployment benefits.[8] Search theory predicts that the higher unemployment benefits (relative to income) the more likely workers are to prolong their period of search. Thus we would expect higher levels of unemployment at each level of vacancies following the increase in unemployment benefits. This would cause an outward shift to the UV curve. We conducted a number of experiments in which various forms of an unemployment benefit variable were included in (4.7). The coefficient on this variable rarely proved significant and was always of an incorrect sign.

The major competing theory, from the demand "friction" side, is the "shake-out" hypothesis first porposed by Taylor (1972). The so called "shake-out" occured when firms, that had been hoarding labour, suddenly changed their policy and initiated a substantial shedding of unwanted labour. Such action would create proportionately higher unemployment during the periods of low activity in the labour market than before. However, as unemployment fell, the discarded labour would be re-employed along with the "usual" unemployment pool. Evans (1975) argues that this would imply a shift in the UV curve similar to that actually found in the New Zealand case after 1977 (IV) (Figure E). However, to produce a shift in the UV curve of this type, firms would also have had to increase the number of vacancies available at each level of employment. While it is reasonable to expect that they would have done so, the issue cannot be empirically investigated because of lack of data.

Supply-curve shifts arise from changes in participation rates and/or changes in the proportion of the population of working age. Included in this category of influences would be changes in the participation rates of particular groups within the economy such as youths and women. Foster (1974) found these changes to be of importance in explaining shifts of the UV curve in the UK. To test their importance in the New Zealand case we incorporated into (4.7) a youth variable (the proportion of persons aged 15-19 in the labour force) and a female variable (the proportion of women in the labour force). Neither variable proved successful and, again, the details of the results have not been reported.

Shifts in the labour supply curve will also occur as a result of migration changes. A sudden upswing in net migration may increase the labour force to such an extent that the UV relation is fractured. However any tendency of increased migration to move the UV curve outward may be offset by a reduction in the number of vacancies, at any level of unemployment, as the migrants, with the requisite skills, move into jobs that nationals lack the qualifications to obtain. On the basis of this argument Hughes (1975a) and Harper (1980) have claimed that the reduction in the number of assisted migrants coming into Australia has caused the Australian UV curve to move out. The inclusion of a net-migration variable in (4.7), however, did not support this argument in the New Zealand case.

One of the difficulties in testing for causes of the shift in a country's UV curve is that, because of data problems, the shift may be more apparent than real. All the authors who have examined the problem have tended to assume, almost without discussion, that registered unemployment and registered vacancies are accurate measures of the true variables. An exception is Harper (1980) who warned of the possibility that registered unemployment and registered vacancies might be "unreliable and/or inconsistent indicators of the underlying economic phenomon they are designed to measure" and that this could result in shifts of the UV curve which are illusory. Evans (1977) had earlier found limited evidence of changes in the meaning of registered unemployment data over time and Parikh (1982) used econometric models with unobservable variables to show that the estimation of the UV relationship was quite sensitive to errors in the data. We will proceed therefore, to examine whether or not Harper's conjecture with respect to the use of registered unemployment and vacancy statistics is applicable in the New Zealand case.

In Chapter 6 we considered the possibility that the propensity to register as unemployed had changed over time. The evidence most often quoted in support of this argument is the change in coverage of registered unemployment when compared with unemployment from the Census. At the time, we noted that this argument rested on two crucial points. First, that Census unemployment was a good estimate of true unemployment. Second, that no other factors had caused the change in coverage. In the absence of adequate data, we concluded that no judgement could be passed on either of these assumptions. Nevertheless, we devised a method of estimating "census equivalent" unemployment from registration data (Section 5.4, Chapter 6) and used it in subsequent analysis "as if" it provided an adequate measure of true unemployment.

The concept of "census equivalent" unemployment can be used in the present context. After calculating "census equivalent" unemployment rates (UCr^e) from quarterly registered unemployment over the period 1960 (I) to 1981 (IV) we substituted them for UR in (4.7). This produced the following result.

$$
\begin{aligned}
\text{Log } UCr^e = \; & \underset{(-3.899)}{-0.109} \underset{(-7.095)}{- 0.374} \text{ Log } VR_t \underset{(1.215)}{+ 0.061} \text{ Log } VR_{t-1} \\
& \underset{(8.204)}{+ 0.578} \text{ Log } UCr^e_{t-1} \underset{(-1.170)}{- 0.326} S_1 \underset{(3.795)}{+ 0.109} S_2 \\
& \underset{(-0.605)}{- 0.166} S_3 \underset{(4.770)}{+ 0.782} SHA_1 \underset{(0.348)}{+ 0.251} SHA_2 \\
& \underset{(4.385)}{+ 0.376} SHB_1 \underset{(2.195)}{+ 0.122} SHB_2 \qquad (5.1)
\end{aligned}
$$

$\bar{R}^2 = 0.968 \quad D.W. = 1.520 \quad h = 2.22 \quad DF = 76$

The structural shifts that were observed in equation (4.7) are still to be found, however they are now much smaller in magnitude. It would seem that a large part of the shifts in the UV curve, estimated from registration data, can be explained by changes in the "propensity" to register as unemployed.

In New Zealand the Department of Labour has, until recently, conducted a six monthly survey of unfilled vacancies (Labour and Employment Gazette). Woodfield (1975) commented that it seems reasonable to assume that these closely approximate true vacancies, since they are collected without reference to their use, and there appears no reason to expect misrepresentation in any sense on the part of employers. Unfortunately the department's definition of a vacancy was altered in 1978 which meant that subsequent figures were not comparable with earlier data (Department of Labour, 1979c, p.45). Nevertheless we will assume that the impact of the change is marginal[9] and that the published statistics of surveyed vacancies represent the best approximation to "true" vacancies available.

The survey of vacancies is conducted in April and October. We therefore re-estimated our model utilizing the surveyed vacancy data and "census equivalent" unemployment rates for April and October. The shift dummies, SHA^*_1 and SHB^*_1, switched in the first half of 1971 and, SHA^*_2 and SHB^*_2, in the last half of 1977. The results were as follows.

$$\begin{aligned}
\text{Log } UCr^e_t = {} & \underset{(3.055)}{0.283} - \underset{(-2.944)}{0.401} \text{ Log } VS_t + \underset{(0.371)}{0.049} \text{ Log } VS_{t-1} \\
& + \underset{(4.455)}{0.752} \text{ Log } UCr^e_{t-1} - \underset{(-1.083)}{0.159} \text{ Log } UCr^e_{t-2} \\
& - \underset{(-0.587)}{0.039} S_1 - \underset{(0.640)}{0.561} SHA^*_1 - \underset{(-1.390)}{0.443} SHA^*_2 \\
& + \underset{(1.282)}{0.189} SHB^*_1 - \underset{(1.323)}{0.567} SHB^*_2 \qquad (5.2)
\end{aligned}$$

$\bar{R}^2 = 0.890$ D.W. - 2.146 h = not defined DF = 32

Equation (5.2) exhibits no evidence of shifts in the structural relationship between unemployment and vacancies over the period of our study suggesting that the recent increase in New Zealand's unemployment may be due to factors other than an increase in the degree of structural disequilibrium in the labour market. In addition, these findings, in conjunction with those of equation (5.1) suggest that Harper's warning on the use of recorded vacancy and unemployment data in estimating the UV relationship is well founded.

6. CONCLUSION

In this chapter we have estimated the UV relationship for New Zealand over the period 1960 (I) to 1981 (IV). We found that the relationship does not assume one of the variety of simple functional forms but rather takes a more sophisticated form in keeping with the expectations of the theory developed in Chapter 4 and reviewed here in Section 2. The analysis of Section 4 enables us to show that the observed relationship between registered unemployment and registered vacancies changed its shape in 1971, and both its shape and its position in 1977. In Section 5 we attempted to provide an explanation for the observed shift. Factors that might be expected to account for shifts in the labour supply curve were found to be unimportant as were changes in the level of unemployment benefit (which could have been expected to have the result of increasing the amount of search in the labour market.) Findings from our earlier analysis gave some support to the "shake out" hypothesis but inadequate data prevented us from pursuing this explanation. Substituting "census equivalent" unemployment rates for registered unemployment rates and surveyed vacancies for registered vacancies led to the conclusion that the observed shifts in the UV curve were probably illusory, resulting from the fact that neither registered vacancy figures nor registered unemployment figures are reliable estimates of the true value of these variables and, more importantly, the relationship they bear to the true value of the variables tends to change over time.

The results of the previous chapter led us to conclude that, amongst other things, the recent increase in New Zealand's unemployment was not due to a rise in "frictional" or "structural" unemployment. The findings of this chapter confirm this conclusion. In particular our results cast doubt on the value of search theory in explaining the current state of the New Zealand labour market. We have previously noted that if the search theoretic hypothesis, that unemployment has risen because of increased quits and longer search, is to be maintained, evidence of an outward shift in the UV curve would have to be found. Although such a finding was made, our analysis suggested that it was largely an apparition. However, to the extent that the observed shifts reflect real changes, they are likely to result from the demand side of the market and not from changes in either labour supply or search activity.

NOTES

1. The analysis presented in this chapter has been published in Hicks and Chin (1984a).

2. See Green and Cousineau (1976) for Canada, Driehuis (1978) for an international coverage of the UV concept which includes Germany, the Netherlands, the United Kingdom, Belgium and France; Harper (1980) for Australia and Parikh (1982) for the United Kingdom.

3. The registered unemployment rate is obtained by dividing registered unemployed by the estimated work-force. The registered vacancy rate is calculated from a similar procedure. The data are obtained from Department of Statistics (various,a). For convenience we have reversed the axis when compared with our theoretical presentation. Henceforth we will continue to record unemployment on the vertical axis.

4. See for example, Holmlund (1975), Woodfield (1975) and Green and Cousineau (1976).

5. See for example, Holden and Peel (1975), Parikh (1977), Warren (1977) and (1980), and Bewley (1979).

6. A lag structure of this type was used by Harper (1980).

7. The positive coefficient of VR_{t-1} is not unexpected and is in keeping with our theory. It is this response that would generate observations such as t and t-1 in Figure B and therefore produces the counter-clockwise pattern of observations about a steady-state UV curve.

8. The impact of changes in unemployment benefit rates in the context of UV analysis has been the subject of investigation by Gujarati (1972), Harper (1980) and Hannah (1983a). In the next chapter we take a detailed look at the impact of unemployment benefits on the level of unemployment.

9. Shift dummies for the period 1978(2) to 1981(2) in a regression of surveyed vacancies on registered vacancies proved not to be significantly different from zero.

CHAPTER 10

UNEMPLOYMENT BENEFITS AND THEIR IMPACT ON UNEMPLOYMENT IN NEW ZEALAND[1]

1. INTRODUCTION

As we observed in Chapter 4, both the search theory model and the utility maximization model of individual choice predict that there is likely to be an increase in the level of unemployment resulting from a rise in the level of unemployment benefits. One of the major areas of empirical study related to search theoretic concepts in recent years has been the attempts made to estimate the relationship between unemployment and unemployment benefits. The major findings of these studies are reported in Chapter 5. In this Chapter we look specifically at the nature of the relationship in New Zealand. Although Braae (1978) has previously considered this question a number of reasons justify further enquiry. First, Braae's work utilized data prior to 1976. It was only after this date that unemployment became a problem of some magnitude in the New Zealand economy. The role, if any, that changes in the unemployment benefit had in contributing to this increase is worthy of examination. Second, Braae, as part of his argument, utilizes the ratio of unemployment benefit to gross average earnings. However, because of the amount of "fiscal drag" that has occured since 1976, it may be more suitable to compare benefits with average earnings net of tax. Third, Braae devoted his attention to total unemployment. Our study of New Zealand's unemployment suggests that the labour market experiences of men and women are significantly different. Consequently it seems prudent to give some consideration to the effect of changes in benefit on unemployment by sex. Fourth, our study will focus on the impact of benefit payments on the duration of unemployment as well as on the unemployment rate. Fifth, a number of variables, apart from the replacement ratio[2], may work to induce unemployment. Other variables may operate to reduce the inducement impact. We examine the impact both types of factors have had on unemployment in New Zealand. Finally, Braae's study attempted to discover if there was a relationship between unemployment and unemployment benefit in New Zealand as predicted by the utility maximization model of labour - leisure choice. In this study we are concerned with establishing whether or not search theory is a viable competing explanation of any relationship found and if, at least in part, the existence of a relationship can explain the recent rise in unemployment.

The structure of the chapter is as follows. In Section 2 we describe the benefit system in New Zealand and compare it with a selection of systems found overseas. A description of the recent operation of the New Zealand system is provided in Section 3. Section 4 discusses the trends in both unemployment and unemployment benefits.

An econometric analysis of the relationship between unemployment and unemployment benefits is undertaken in Section 5. Section 6 concludes.

2. UNEMPLOYMENT COMPENSATION SYSTEMS

In any one country the system of unemployment relief measures typically embraces a number of different programmes. Hence, it is somewhat misleading to describe the systems of one or a number of countries in general terms for purposes of comparison. Nevertheless, in discussing the New Zealand system, we feel that it is important to present the alternatives. Therefore we highlight some of the variations observed in those countries whose disaggregated unemployment statistics have already been the subject of examination in Chapter 2.

Perhaps the biggest difference between countries results from the essential nature of the benefit scheme used. Two main types of scheme can be identified. The first, the insurance scheme, is, as the name implies, a method by which employees are insured against unemployment. Only those covered by the scheme are able to obtain benefits although the insurance premiums may be paid by employers or the employees or be subsidized by the State. The second type of scheme is the unemployment benefit system which is basically an extension of the country's social welfare programme. Coverage does not require

1. The Coverage of Unemployment Benefits

Country	Coverage[a] %
Australia	98[b]
Norway	90
United Kingdom	80
USA	95
New Zealand	98[b]
Germany	93
Netherlands	75–89
Israel	90

[a] Ratio of covered employeed to total work force.

[b] Those under sixteen years of age are not covered.

Source: Central Bureau of Statistics (1976); Mittelstadt (1975); OECD (1979); Australian Bureau of Statistics (1980); Department of Social Welfare (1983).

membership in the sense of being a member of an insurance scheme although certain criteria must usually be met before an unemployed worker can become a recipient. In this section we will focus on the following aspects of the two types of schemes; (1) the extent of coverage and the effect of eligibility requirements; (2) the duration of benefit; (3) the average size of benefit and (4) the financing of the benefit.

2.1 Coverage and Eligibility

The effective coverage ratio depends on coverage by area and type of employment, and the stringency of eligibility requirements. In the countries studied variation was largely the result of the latter. In no country is coverage complete although it is nearly so in New Zealand, Israel, Australia, the USA, Germany and Norway. In the UK and the Netherlands, however, about 20 percent of the work-force remains uncovered (Table 1).

The variations in coverage arise for a variety of reasons. For example in New Zealand and Australia benefits are not available to 15 year olds, in Israel they are not usually available to minors and in Norway the self-employed under the age of 64 are excluded. In the UK all of the self-employed are excluded and, in addition, married women may choose not to be part of the scheme.

A wide range of factors may determine eligibility. These will normally include a certain number of weeks work prior to taking up the benefit, proven willingness to work or undertake training, an acceptable reason for loss of employment and, in some cases, a minimum level of earnings. In New Zealand, an applicant for unemployment benefit is required to satisfy the authorities: (a) that they are unemployed; (b) that they are capable of undertaking and are willing to undertake suitable work; (c) that they have taken reasonable steps to obtain suitable employment; and (d) that they have resided continuously in New Zealand for not less than 12 months at any time (Department of Statistics, various b). The New Zealand system is harsh on workers who have become unemployed either voluntarily or as a result of alleged misconduct as the authorities may postpone, for a period not exceeding 6 weeks, the commencement of the benefit. However, in New Zealand, no period of work is required before an individual becomes eligible for benefit. Thus those entering the work force for the first time, along with those re-entering, immediately become eligible for the benefit. Mittelstadt (1975) reports that pre-benefit employment requirements substantially reduce the coverage ratio in other countries. For example, in Germany, 26 weeks of employment over a 3 year period preceeding unemployment were required before a worker was eligible for benefit. In the UK, 26 weeks out of 52 must have been worked. In the USA there was also a qualifying period but its length varied considerably between the states.

Although the coverage ratio is not restricted in New Zealand by the existence of a qualifying period, it is adversely affected by the income test. The income test is used to assess whether the family income has fallen below the level or levels which are accepted as being adequate, and in all cases the income of both the claimant and the claimant's spouse is taken into account. The Royal Commission on Social Security (1972) argued that to do otherwise, would be to pay the benefit "where a need did not exist". This eligibility requirement excludes most married women. However, New Zealand is not unique in enforcing such a regulation. Australia also operates a similar means test for determining benefit eligibility (Australian Bureau of Statistics 1980).

2.2 Duration

The average length of time for which a benefit is available differs considerably among countries. In many it depends upon the type of unemployment (e.g. temporary layoffs or redundancy), the length of the individual or employer contribution (see 2.4 below) and the age of the recipient. In addition there is often a waiting period before the payment of benefits commence. In New Zealand, and Australia, benefits are usually not payable in respect of the first 7 days of any period of unemployment (14 days for New Zealanders who are single). This is not always enforced and emergency benefits may be granted on the grounds of hardship to persons who do not qualify for the ordinary unemployment benefit. In a number of other countries, the claimant can benefit from supplementary welfare programmes when unemployment insurance has been exhausted; usually, however, a reduction would be involved.

In New Zealand, the benefit is payable so long as the beneficiary is unemployed or until he becomes eligible to receive another class of benefit (e.g. national superannuation). The benefit may be terminated, however, if the beneficiary has refused or failed, without a good a sufficient reason, to accept any offer of "suitable" employment. These regulations contrast favourably with a number of other countries in which more severe restrictions are imposed. In the US, most individual states only give benefits for a period, varying between 20 and 36 weeks, with the period of maximum benefit depending on the length of previous covered employment. However, in addition, "trigger" mechanisms come into play which lengthen the duration of benefit when the national or local insured unemployment rate, or the national or local unemployment rate, reached certain thresholds. In Germany and the UK, the maximum benefit period is approximately 52 weeks, although in both countries substantial welfare systems exist for those who exhaust benefits. In the UK, the higher earnings related benefits end after 26 weeks.

2.3 The Average Size of Benefits

The average size of the benefit received varies from country to country. One of the major reasons for this is the basis on which the benefit is calculated. In some countries benefits are earnings related. For example, in the US benefits are approximately 51 percent of gross earnings, although this greatly varies between states. In Germany, benefits are 60 percent of gross earnings (Mittelstadt 1975, p.5). At the other extreme, Australia and New Zealand operate a flat-rate system which tends to keep the replacement ratio down. From information reported in Department of Statistics (various b) we calculate that for the period 1960-1981 the average ratio of the single benefit to gross average earnings in New Zealand was 29.3 percent and that in 1981 the ratio was only 26.8 percent. In the UK an intermediate system is operated in which a flat rate is paid for the full period with an earnings related supplement for the first half year. The introduction of the partially earnings related scheme (ERS) in the UK raised the ratio of benefit and by 1978 the replacement ratio for a household head with two children was reported as 66 percent with ERS and 49 percent without. (Atkinson 1981).

The 1972 inquiry into the New Zealand welfare system (Royal Commission 1972) received a number of submissions arguing that unemployment benefits should not be paid on a flat-rate basis but should consist of variable rates related to the beneficiary's previous earnings. Their case rested on the proposition that anybody earning a higher income needs a greater benefit to preserve a reasonable relationship with the standard of living which obtained before income was interrupted by unemployment. The Commission, however, rejected this claim for two reasons. First, the unemployment benefit needs to cover those who are seeking to enter the work force, who have no earnings history on which to base a benefit, and who have had no chance of contributing towards an adequate benefit. Second, a person may lose a highly paid position and, with or without an intervening period of unemployment, have to accept a much lower paid position. The earnings-related benefit might be greater than the salary which he is now able to command. The commission felt that this raises considerable problems which are compounded by such inevitable considerations as fault and inefficiency.

2.4 Financing Benefits

The Royal Commission into social security noted that earnings related systems were usually based on specific earnings-related contributions. Even if such disabilities as age or invalidity could be adequately covered in this way the Commission was not convinced that the hazards of unemployment could be so covered and that at some stage the State must meet the bill from general revenue (Royal Commission 1972). Up until 1964 there had been in operation a Social Security Fund which was separate from the general revenue pool and financed by a social security tax, the initial rate of which was 7.5 percent on all income. In 1969 the social security tax was absorbed into the composite progressive income tax for individuals and companies (Braae 1978). The current practice is therefore to meet all social security expenditure, including the unemployment benefit, out of consolidated revenue. This practice is also followed in Australia.

In the US and Germany, by contrast, contributions are made into separate funds dealing exclusively with unemployment or short-time workers. The German system involves both employer and employee contributions. As in other countries with similar procedures, these contributions represent a fixed percentage of wages up to a ceiling, which is commonly raised in line with the rise in earnings. Some countries have increased contribution rates recently as a means of combating the increasing social costs that have arisen in the wake of the world-wide recession. In the US all contributions to the fund come from employers. However, special provisions allow additional financing, partly from the general budget, for exceptional measures to lengthen the benefit period. In the UK, unemployment insurance is only one part of the national insurance system, which also includes both health insurance and pensions. As a consequence it is not possible to isolate the unemployment-related contributions (Mittelstadt 1975). Nevertheless receipt of benefit of any type (including unemployment benefits) requires a minimum value of contributions. Contributions are proportional to earnings and the 1980/81 rates were 6.75 percent of earnings paid by the employee and 10.2 percent paid by the employer (Disney 1981).

3. NEW ZEALAND'S UNEMPLOYMENT BENEFITS: A STATISTICAL BACKGROUND

In this section we take a closer look at the operations of the New Zealand system of unemployment benefits. We look specifically at the following areas; (1) total expenditure; (2) demographic and occupational breakdown; (3) duration of benefit and (4) regional breakdown.

3.1 Trend in Expenditure

In 1981, total expenditure on unemployment benefit in New Zealand was just over \$118.5 million (Table 2). This represented a considerable rise over the average for the period 1970-1975 of just over \$3 million. In real terms the income is somewhat less because of inflation. Nonetheless, even after taking price increases into account, expenditure on unemployment benefit in 1981 was still over 13 times the average for the period 1970-1975. This increase clearly reflects the very rapid rise in unemployment that has taken place and the consequent increase in the number of persons applying for and being granted unemployment benefit. The number of benefits granted stood at 123,507 in 1981, nearly 10 times the average for 1970-1975.

2. Unemployment Benefits in New Zealand

Year	Number of Benefits Granted	Expenditure $'000	Real Expenditure $'000	Real Expenditure per Benefit Granted %	GDP $'000,000	Expenditure as percent of GDP %	Average Benefit[a] $	Real Average Benefit $
1960	3588	380	894	249.16	2453	0.015	9.50	22.35
1961	1320	185	428	324.24	2654	0.006	9.50	21.99
1962	1228	160	360	293.15	2753	0.006	9.63	21.69
1963	3541	327	723	204.17	2967	0.011	9.88	21.86
1964	2310	322	688	297.83	3239	0.009	10.30	22.01
1965	1855	197	407	219.40	3550	0.006	10.60	21.90
1966	1237	141	283	228.77	3838	0.004	11.05	22.23
1967	1300	141	267	205.38	3998	0.003	11.63	22.03
1968	24027	2176	3949	164.35	4167	0.052	12.00	21.78
1969	24206	3302	4712	235.97	4388	0.075	12.75	22.06
1970	8924	1465	2385	267.25	4851	0.030	13.92	22.67
1971	6132	1004	1478	241.03	5522	0.018	15.38	22.65
1972	18112	2683	3695	204.00	6414	0.042	18.03	24.83
1973	24532	5034	6848	279.14	7421	0.068	22.40	30.48
1974	8184	3462	3961	483.99	8727	0.040	25.02	28.63
1975	9198	5155	5155	560.44	10028	0.051	28.78	28.78
1976	28255	8493	7252	256.66	11484	0.074	33.39	28.51
1977	25601	13429	10029	391.74	13792	0.097	38.64	28.86
1978	50588	19865	13252	261.95	15217	0.031	43.98	29.34
1979	87107	54236	31847	365.60	17541	0.309	49.09	28.83
1980	94906	66077	33104	348.80	20966	0.315	56.81	28.46
1981	123507	118575	52513	425.18	24127	0.782	66.08	29.26

[a] Average of all single, over-twenty rates for unemployment benefit quoted in each year.

Source: Department of Statistics (various a); Department of Statistics (1976); International Monetary Fund (1981); Unpublished data from the Department of Social Welfare.

Real expenditure per unemployment-benefit recipient has also shown an increase. However, although the increase between 1960 and 1981 is just over 70 percent, it is not as high as may have been expected because of the rise in the ratio of single beneficiaries to married beneficiaries over the period.[3]

As a proportion of GDP unemployment benefits have traditionally been quite low (Table 2), the recent rise in unemployment has not managed to bring this figure up to 1 percent. It would appear that in New Zealand the <u>responsiveness</u> to unemployment of unemployment benefit payments, as a percent of GDP, is quite low. A one percent rise in unemployment can be expected to generate a rise of only 0.94 percent in the ratio.[4] Although this is by no means negligible, it clearly falls short of offsetting the deficiency in output and incomes which generated the increased unemployment. Thus, in terms of acting as an automatic stabiliser of the business cycle the impact of unemployment benefits will be quite small.

3.2 Demographic and Occupational Aspects

Only a limited amount of published data is available on the demographic breakdown of unemployment benefit over the period with which we are primarily concerned. However, a recent Department of Social Welfare publication (Department of Social Welfare 1983) does provide some analysis of the very recent history. As at December 1982,

3. Occupational Breakdown of Unemployment Benefits

Occupation	Number	Percent	Median Duration (Weeks)
Professional, Technical and Managerial	2293	5	7
Clerical	2107	5	8
Sales	1887	4	9
Service	3089	7	11
Agriculture etc	1972	5	11
Freezing Workers	899	2	18[a]
Labourers, tradesmen or skilled operators	23510	55	11
Never Employed	7314	17	4
	43071	100	9

[a] Seasonal workers show high seasonal variation.
Source: Department of Social Welfare (1983).

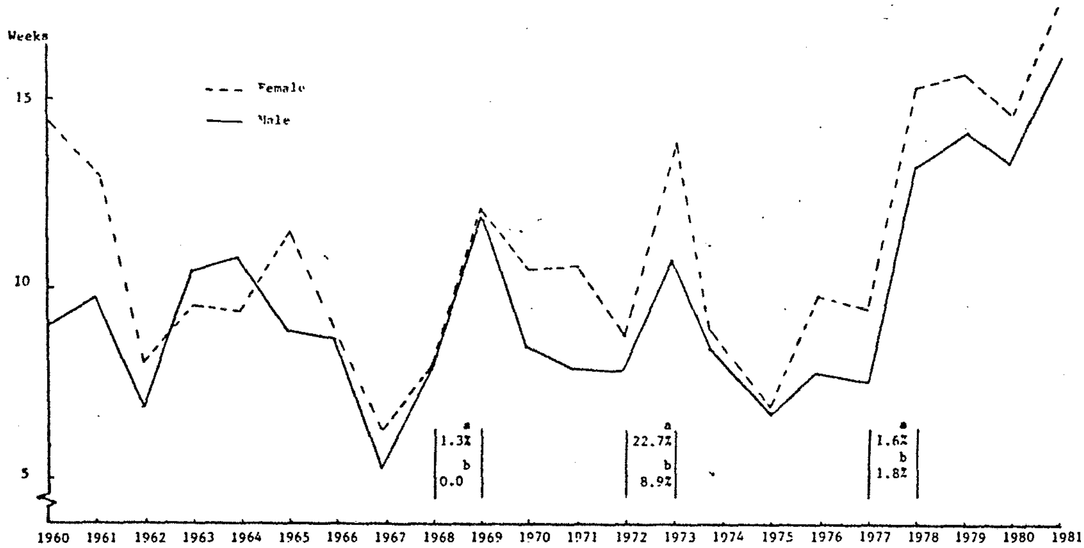
63 percent of recipients were male and 37 percent female. As expected from our analysis in the previous section only 17 percent were married (most of these being male) and 83 percent were single. From our study of the distribution of unemployment by age (Chapter 2) we would expect that unemployment benefit recipients would also be concentrated in the younger age groups. This was found to be the case. 35 percent of recipients are under 20 years of age and 66 percent are under 26 years of age.

Table 3 provides a breakdown by occupation. About half of those receiving benefits fall into the unskilled or semi-skilled category. It is significant to note however, that there were 2,293 persons in the professional, technical and managerial groups receiving the unemployment benefit. In addition, 17 percent of the total have not held any previous employment.

3.3 Duration on Benefit

As we observed in Chapter 7, one of the advantages of the records kept by the Department of Social Welfare in New Zealand is that they do provide some information on completed spells on unemployment benefit. We considered the duration on benefit in detail in Section 3.6 of Chapter 7 and need only summarise our findings here.

FIGURE A: The Duration of Completed Spells on Unemployment Benefit. New Zealand.



[a] Increase in real average benefit
[b] Increase in replacement ratio
<u>Source</u>: Department of Social Welfare (various); Department of Statistics (various b); International Monetary Fund (1981); Unpublished data provided by the Department of Social Welfare.

4. Unemployment Benefits by Region (31st December 1982)

District	Total	Percent of Total	Average Duration of Current Spells on Benefit (Weeks)
Whangarei City	548	1.27	35.0
Rest Whangarei Area	1469	3.41	28.0
Auckland City	7325	17.01	18.7
Rest Auckland Area	4782	11.10	27.2
Hamilton City	1724	4.00	17.5
Rest Hamilton Area	2325	5.40	22.7
Rotorua City	698	1.62	11.7
Rest Rotorua Area	1417	3.29	17.3
Tauranga City	643	1.49	7.7
Rest Tauranga Area	492	1.14	9.9
Gisborne City	464	1.08	10.6
Rest Gisborne Area	115	0.27	11.8
Napier-Hastings Cities	2008	4.66	20.6
Rest Napier-Hastings Area	546	1.27	18.3
New Plymouth City	356	0.83	13.9
Rest New Plymouth Area	600	1.39	17.0
Wanganui City	628	1.46	20.4
Rest Wanganui Area	272	0.63	21.7
Palmerston North City	923	2.14	19.2
Rest Palmerston North Area	640	1.49	23.5
Masterton City	236	0.55	10.4
Rest Masterton Area	135	0.31	9.7
Wellington City	3240	7.52	16.3
Nelson-Blenheim Cities	547	1.27	10.5
Rest Marlborough Area	465	1.08	15.5
Westport-Greymouth Cities	324	0.75	21.9
Rest West Coast Area	201	0.47	18.6
Christchurch City	5445	12.64	33.3
Rest Christchurch Area	714	1.66	29.7
Oamaru-Timaru Cities	514	1.19	15.1
Rest Oamaru-Timaru Area	229	0.53	17.7
Dunedin City	1157	2.69	16.6
Rest Dunedin Area	294	0.59	19.1
Invercargill City	767	1.78	12.6
Rest Southland Area	208	0.48	11.1
Total	43071		21.3

<u>Source</u>: Department of Social Welfare (1983).

Figure A, which records the average completed duration of a spell on benefit, shows considerable cyclical fluctuations, with female spells generally exceeding male spells. From the information provided in Table 11 of Chapter 7 we can expect female spells on benefit to be longer in all age groups and spells for older workers, of both sexes, to be longer than any other group. Table 3, which unfortunately only records the median of spells in progress, indicates that the less skilled, and especially those in seasonal occupations, are likely to experience longer spells on benefit than workers in other occupations. Finally, we recall from Table 16, Chapter 7, that spells on benefit in excess of three months accounted for over 40 percent of all spells on benefit and over 70 percent of spells existing at any point in time.

3.4 Regional Distribution

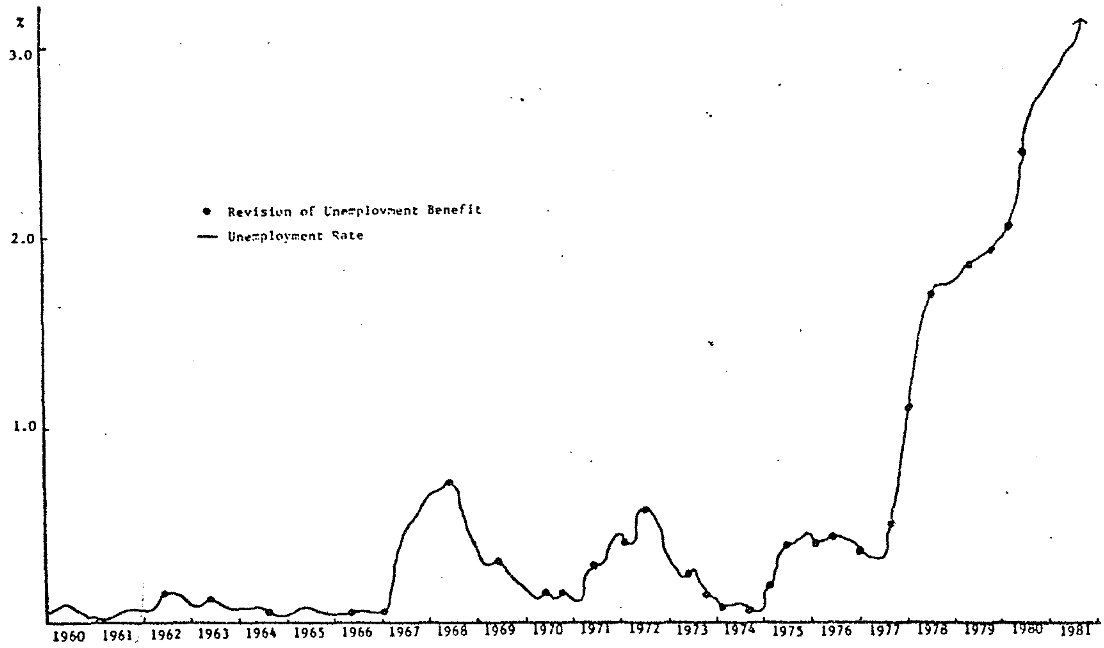
We have previously discussed the regional distribution of unemployment and have noted, with some qualification, that particular regions appear to be more adversely affected than others. The distribution of unemployment benefits follows a somewhat similar pattern. Of course, however, the major proportion of benefit payments are made to the areas in which the major concentrations of unemployment are found as exhibited in Table 4. The table also reports the average duration of current spells which, as we have previously indicated,

is a somewhat poor measure. Nevertheless, accepting these limitations, there does appear to be some divergence from the national average in duration of spells on benefit experienced from region to region. In particular Whangarei and Christchurch display markedly higher durations, while Masterton and Tauranga appear to experience shorter spells on benefit.

4. TRENDS IN UNEMPLOYMENT AND UNEMPLOYMENT BENEFIT

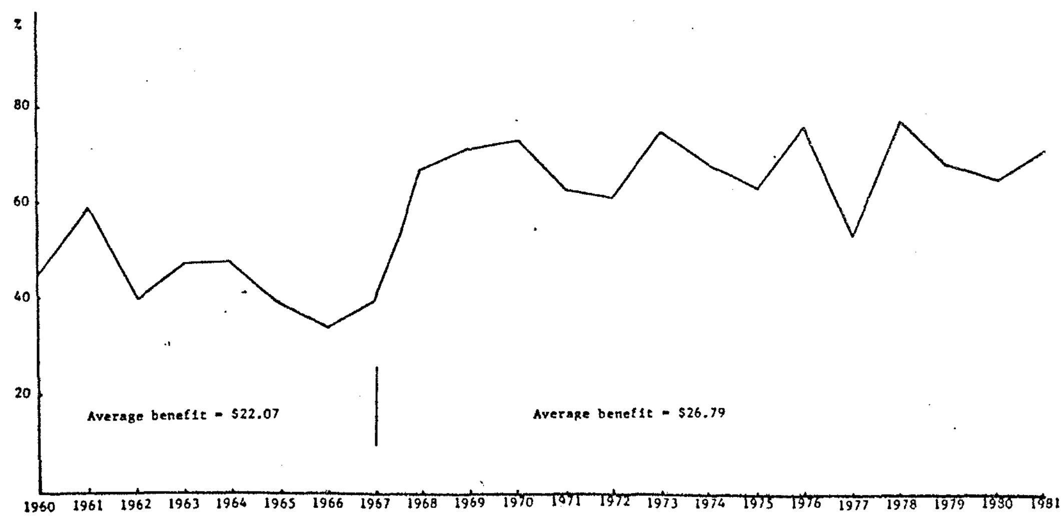
Section 3 of Chapter 4 considered, theoretically, how increases in unemployment benefit may produce a rise in both the unemployment rate and the duration of unemployment. In the next section of this chapter we will use the theoretical model in an econometric test of the relationship between unemployment and unemployment benefits. In this section, however, we consider in a more casual manner, the relationship as it has been experienced in New Zealand. We look, in turn, at the relationship between unemployment benefits and (1) the unemployment rate, (2) the ratio of benefit recipients to registered unemployed and (3) the duration of unemployment.

FIGURE B: Registered Unemployment Rate and Unemployment Benefit Increases.



Source: Department of Statistics (various a), Unpublished data provided by the Department of Social Welfare.

FIGURE C: Proportion of Registered Unemployed in Receipt of Unemployment Benefit



Source: Department of Statistics (various a), Unpublished Data provided by the Department of Social Welfare.

4.1 The Unemployment Rate

Figure B displays the quarterly movement in the unemployment rate from 1960 to 1981 and the points in time at which the unemployment benefit has been adjusted. No discernable pattern emerges. There are a number of periods in which the unemployment benefit has risen just prior to a marked increase in unemployment (e.g. 25.1.67, 2.9.70, 3.7.74 and 12.1.77). However there are also a number of periods in which unemployment benefits have been raised at the peak level of a cycle in unemployment (e.g. 12.6.68, 5.7.73 and 23.7.76). Rises in the benefit have also taken place during upswings and downswings in the unemployment rate. Obviously, such a check cannot provide rigorous proof of the absence of any decrease in work effort on account of unemployment benefit; but the procedure can at least serve to indicate that if there was such a decrease this could not have been strong enough to leave a definite mark in the national unemployment figures.

4.2 The Ratio of Benefit Recipients to Registered Unemployed

The results derived from a comparison of the behaviour of aggregate unemployment rates and benefit changes can be supplemented by a similar comparison involving the percentage of registered unemployed receiving benefit. (Figure C). At any particular moment in time, of the total number of workers registered as unemployed, only a certain proportion will actually receive unemployment benefit. Others will be registered for work, but because of the reasons outlined in Section 2, will not qualify for benefit. Given these conditions, a tendency by workers to substitute leisure (or search) for work on account of higher unemployment benefit should be reflected (other things being equal) in a rise in the percentage of those drawing unemployment benefit.

The data assembled in Figure C gives only limited support to this hypothesis. The mean of the real average benefit for the period 1960 to 1967 was \$22:07. For the period 1968 to 1981 it was \$26:79. As can be observed from the graph in Figure C the percentage of unemployed receiving unemployment benefits has been much higher during the latter period despite the fact that the proportion of applicants denied, as reported in correspondence with the Department of Social Welfare, has been higher. However, the period in which the break appears to have occured, 1966-68, actually saw a slight drop in the real average benefit (Table 2).

4.3 Duration on Benefit

As a final test we can check on whether there appears to be any obvious relationship between changes in unemployment benefit rates and duration on unemployment benefit. A significant substitution of leisure (or search) for work following an increase in unemployment benefit would show itself in a rise in the absolute level of unemployment and in a rise in the percentage of those drawing unemployment benefit, but it might at the same time be reflected in a general tendency for unemployment to lengthen. A test of this aspect is undertaken in Figure A for completed spells on benefit. Duration has fluctuated quite dramatically, as noted previously in Section 3.3, with peaks appearing to lag the peaks in the unemployment rate (Figure B). There are three periods in which duration of unemployment for both males and females increased quite sharply. They are 1968-69, 1972-72 and 1977-78. Real average benefit increased in each of these periods, however, the only substantial increase (of 22.7 percent) occured between 1972 and 1973. The replacement ratio also showed an increase in this period although in the first period, 1968-69, no change took place and for the last period the increase was less than 2 percent.

The evidence presented is indicative, but by no means conclusive. There appears to be some support for the hypothesis that increased unemployment benefit has resulted in longer spells on benefit (which we will interpret as longer spells in unemployment). However, the evidence with respect to the unemployment rate and ratio of benefit recipients to registered unemployed is much less convincing. In the next section we will examine more closely the empirical evidence for the relationship between unemployment benefit and unemployment.

5. AN ECONOMETRIC ANALYSIS OF THE RELATIONSHIP BETWEEN UNEMPLOYMENT AND UNEMPLOYMENT BENEFITS

In chapter 5 we considered some of the empirical tests conducted overseas in an attempt to establish a relationship between unemployment benefits and unemployment. Generally, it was found, most researchers were able to show that increased unemployment benefit led to either increased unemployment rates or increased duration of unemployment. However, there was little agreement on the size of the affect although some felt there was more evidence for the impact of benefits on the unemployment rate than on the duration of unemployment. This, it was argued, could be interpreted as evidence against search theory and in favour of the theory predicting the substitution of leisure for work. However, search theorists countered by claiming a correct interpretation of their analysis would result in similar results being expected.

In this section, tests will be undertaken of the relationship between both unemployment rates and duration and changes in unemployment benefits utilizing New Zealand data. We will also consider how our findings relate, in particular, to the hypothesis that increased unemployment is a result of increased search caused by, among other factors, increased unemployment benefit. This section will be divided into four parts. These are (1) review of the theory, (2) discussion of the data, (3) the tests and (4) interpretation of the results.

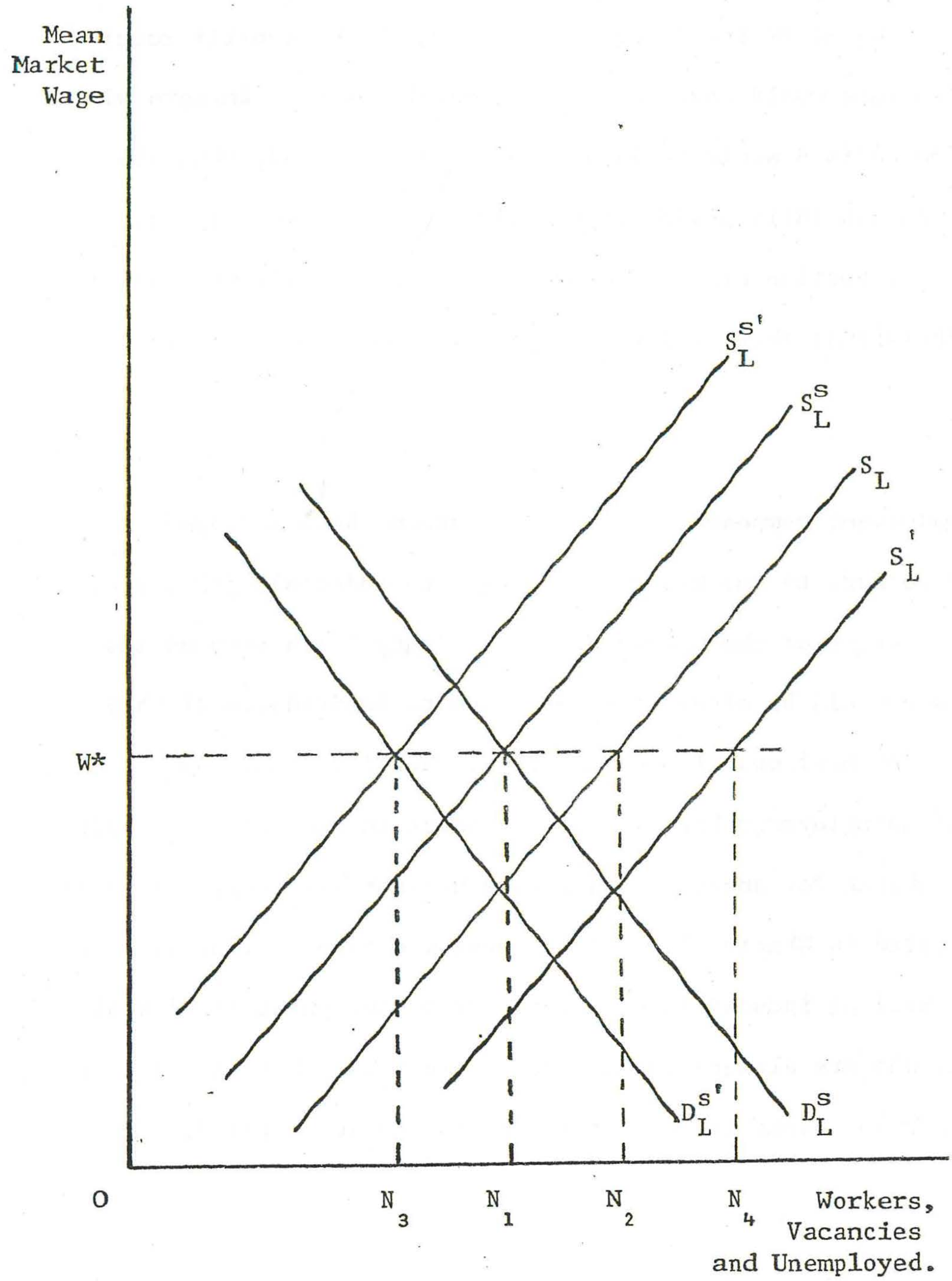
5.1 A Review of the Theory

In chapter 4 we considered, in the context of a utility maximising model of consumer choice, how the introduction of (or increase in) unemployment benefits may result in the increased unemployment of individuals. Basically, changes in unemployment compensation tend to change the budget constraint facing an individual eligible for such payments. The change in the budget constraint will have both an income and substitution effect on the labour-leisure decision and, if leisure is a normal good, will tend to lead to an increased consumption of leisure when the replacement ratio is increased. This may occur because employed workers find it optimal to initiate their own "unemployment" for some period of time or because unemployed workers extend their period of unemployment. If it is assumed that individuals have a lengthy time horizon then any change in benefits may cause workers to enter the unemployed state for a period as the entire budget constraint will be affected. The one provisio is that the costs of job search, which will inhibit such a decision, do not exceed the inducement impact. If workers have a short-time horizon, only part of the budget constraint will be affected and only very large changes in benefit will induce workers to become unemployed.

Induced unemployment is more likely to result, in the case of workers with a long-time horizon, from workers already unemployed extending their period of unemployment. This is because such workers have already incurred the job search costs and their marginal cost of leisure is equal to the foregone income minus the benefit received. (Employed workers would have to add job-search costs). Workers with a short-time horizon would be in a similar polition and, thus, be willing to extend their period of unemployment. However, again, only the lower portion of their budget constraint is affected and it is more likely that they will take a job as soon as one becomes available.

Unemployment compensation may also induce both employed and unemployed workers to use unemployment time to undertake job-search activity. Because of the nature of the activity it is assumed that search theory would be of greater relevance to individuals if they had a long time-horizon. It is not likely therefore, that an increase in unemployment benefits would induce an individual to quit his job to search for another if his time-horizon was short. However, as demonstrated in Chapter 4, an individual who takes a long view of things may well be induced into search. From the point of view of individuals who are already unemployed, whether they have a short or long-time horizon, some inducement to search can be expected.

FIGURE D: The Determinants of Unemployment with Special Reference to Unemployment Benefit.



Thus, in conclusion, we may argue that, other things, including job-search costs, constant, induced unemployment will be an increasing function of the ratio of benefits to income. This relationship is likely to be weak and possibly insignificant if individuals have a short-time horizon but strong and significant of individuals have a longer-time horizon.

From a macroeconomic perspective the consequences of induced unemployment were analysed in Chapter 4 via our simple labour market model. Figure D reproduces this model so that the major issues of current interest may be discussed. As drawn, with a mean market wage fixed at W*, existing measured unemployment is equal to $N_1 - N_2$. An increase in the replacement ratio would result in the shadow-supply curve for labour, S_L^s, shifting to the left. The size of the shift will be determined by, amongst other factors, the number of people already unemployed. This is because the most likely source of induced unemployment will be from those already unemployed increasing their spell - whether to consume more leisure or to undertake search. If the rise in benefit shifts S_L^s to $S_L^{s'}$, measured unemployment will rise to $N_3 - N_2$.

From the diagram we can see that movements in the other curves may generate a similar increase in measured unemployment. First, if the D_L^s curve shifts to $D_L^{s'}$, as a result, for example, of a cyclical downturn, the same increase in unemployment would occur. Second, if the labour-supply curve, S_L, shifts to S_L', as a result of, for example, increased participation rates, unemployment would rise from $N_1 - N_2$ to $N_1 - N_4$, which is equivalent to $N_3 - N_2$. Thus in attempting an econometric analysis that aims at assessing the impact of changes in unemployment benefit on total unemployment at the aggregate level, we will need to include variables that capture the effect of (a) shifts of the D_L and D_L^S curves, (b) shifts of the S_L curve and (c) shifts in the relationship between S_L and S_L'. For convenience we classify variables attempting to capture effect (a) as cyclical variables (CycVar), those attempting to capture effect (b) as labour supply variables (LabSVar) and those attempting to capture effect (c) as labour-friction variables (LabFVar) of which the ratio of unemployment benefits to income (BenY), or the replacement ratio, will be of key interest. The variables used in our analysis within each of these classifications are discussed in the next section.

We are now in a position to specify our basic estimating equations with the unemployment rate (UR) and unemployment duration (UD) as the dependent variables. Those equations are -

$$\text{Log UR} = f(\text{BenY, CycVar, LabSVar, Other LabFVar}) \qquad (5.1)$$

and

$$\text{UD} = f(\text{BenY, CycVar, LabSVar, Other LabFVar}) \qquad (5.2)$$

The use of the logarithimic form of the dependent variable UR in equation (5.1) is consistent with our theoretical analysis. The relevant part of equation (5.1) can be re-written as

$$UR = a + b\ (BenY) + \dots \tag{5.3}$$

so that

$$\partial UR/\partial (BenY) = b \cdot UR \tag{5.4}$$

The semi-log specification of the basic equation therefore implies that the change of the unemployment rate with respect to the replacement-ratio variable is a function of the unemployment rate. This is in keeping with the suggestion that induced unemployment may take the form of an extended spell of unemployment.

The form of the estimating equations which we have chosen is essentially the same as that employed in many previous studies. It is a form which has been subject to considerable criticisms because the precise status of the equation has not been made very clear by the authors using it. Atkinson (1981, p.137) writes "It is presumably a reduced form, obtained from a set of labour market equations, but the full derivation from a theoretical model is not given." It is for this reason that we have couched the development of our estimating equation in the context of a macro model of labour supply and demand. Although our diagramatic approach does not go all the way toward meeting the critics' points it does provide a basis from which such a rebuttal might be made. In particular, our approach demonstrates that the choice of independent variables is not arbitrary but is based on a consideration of the factors affecting demand and supply in the labour market.

5.2 The Variables and the Data

The annual data for our empirical work, covering the period 1960 to 1981, was obtained from unpublished data supplied by the Department of Social Welfare, Department of Statistics (various, a), Department of Statistics (various, b) and International Monetary Fund (1981).

The unemployment rate (UR) is the annual average of the registered unemployment rates at the end of each quarter. We feel that the use of registered unemployment is justified in the current context for two reasons. First, those who are eligible for the receipt of benefit have an incentive to register and it is only this group who are likely to be influenced by changes in benefit. Second, even if the rise in registered unemployment has largely been a consequence of an increased propensity to register, it would be useful to know the extent to which variations in the replacement ratio have contributed to this change.[5] Three unemployment rates are utilized in our reported findings. These are, total unemployment (URT), male unemployment (URM) and female unemployment (URF).[6]

No data is available on completed spells of unemployment. Although data is available on the average length of current spells, the argument presented in Chapter 7 disqualifies this data as having any meaningful interpretation. For our purposes we chose to use the annual average of completed spells on unemployment benefit as a proxy for unemployment duration (UD). This variable has both advantages and disadvantages. One advantage is that it focuses on the group in whom we are most interested, i.e. those who are eligible (and in fact receiving) unemployment benefit. A disadvantage is that we are unable to say anything about their unemployment experience outside the period of benefit receipt. We will, however, assume that non-compensated unemployment for persons who are eligible for benefit is negligible and confined primarily to the statutory stand-down period.[7] Two series for duration are employed - duration of male unemployment (UDM) and duration of female unemployment (UDF).

Two CycVar proxies are used to capture the effect of cyclical fluctuations in unemployment. The first is the percentage change in constant dollar gross domestic product (PCGDP). The second is the ratio of real GDP to its linear trend (RTGDP). The latter variable was suggested by the work of Maki and Spindler (1975). They, however, used the exponential trend of GDP and expressed the variable in logs. In our model this form did not improve the explanatory power of the variable.

We expect the coefficient for PCGDP to have a negative sign since we expect cyclical unemployment to be a decreasing function of the rate of growth in GDP. Likewise, we expect the coefficient of RTGDP to be negative, since a time period when the index of GDP is above the trend value is a period of buoyant economic activity and low unemployment is to be expected.

The only labour supply variable used in our reported findings was ILSET, a variable suggested by the work of Maki and Spindler (1975) which they termed an index of labour supply in efficiency terms. To construct ILSET, we first construct a labour force index given by the formula

$$LFI = LF_t / LF_{1966} \qquad (5.5)$$

where LF is the total labour force. The labour force index is then multiplied by output per worker (O/PE) to give

$$LFI.O/PE = ILSET \qquad (5.6)$$

Strictly speaking this variable is somewhat misnamed by Maki and Spindler since

$$PE = LF\ (1 - \frac{U}{LF}) \qquad (5.7)$$

so that

$$ILSET = \frac{LF_t}{LF_{1966}} \cdot \frac{0}{LF_t\ (1 - \frac{U}{LF_t})} \qquad (5.8)$$

$$= \frac{1}{LF_{1966}} \cdot \frac{0}{(1 - \frac{U}{LF_t})} \qquad (5.9)$$

where $0/(1 - U/LF_t)$ is an expression for "potential output".

Nevertheless, the variable remains suitable for our purposes. A change in potential output, which must result from either a change in labour supply or labour productivity, will have the structural effect on the labour supply curve that we are now seeking to capture. Since technological change and other causes of increases in the efficiency of labour would be expected to increase unemployment and increases in labour supply, ceteris paribus, would also be expected to increase unemployment, a positive sign is hypothesised for ILSET.[8]

The most important of the labour friction variables (variables which affect the distance between S_L and S_L^S) is the replacement ratio, BenY, as it is a relationship between this variable and unemployment that we are seeking to establish. The replacement ratio is the variable which has traditionally been used in studies of this type. However it should be recognized that the use of one variable to capture both an income and substitution effect will not be entirely satisfactory in all circumstances. Harrison and Hart (1983) have suggested two alternative approaches. The first approach rests on the fact that the slope of the budget constraint facing the individual, after the introduction of benefits, is equal to the weekly wage rate less the weekly benefit rate.[9] They therefore propose that a variable measuring the earnings-benefit gap could be utilized. However, intuitively, one would expect a gap of \$50 would be more likely to induce unemployment if the highest attainable income was \$300 rather than \$100.

Relating the earnings-benefit gap to the appropriate income level, as is done when the replacement ratio is used, would therefore seem desireable. Harrison and Hart's second suggestion was to enter unemployment benefit payments and income into the regression equation separately. However they do not provide any theoretical justification for this option.

In our experimentation we tried both suggested alternatives but without success. The replacement ratio, BenY, was retained as our preferred variable both because the equations in which it was included had a greater explanatory power than equations in which the alternatives were used and because there is a stronger theoretical case for its use.

At this juncture it should be noted that although a series has been calculated and published in Department of Statistics (various b) of the ratio of the standard benefit rate to average weekly earnings, it was found to be inconsistent because four different figures for weekly wage payout per person are available and not one of these has been uniquely used. The data presented in the report of the Royal Commission (1972) was taken from this sourse and therefore suffers the same faults. Braae (1978) used this faulty data in his attempt to estimate the effects of unemployment benefit on the level of unemployment and because of this his results, which offered limited support to the hypothesised relationship, are misleading. In addition

Braae chose to use the "married" rate. However, the ratio of single beneficiaries to married beneficiaries was nearly 5 to 1 in 1982 (Department of Social Welfare, 1983). We therefore chose to employ the standard, single, over-twenty unemployment benefit in our investigation. Two replacement ratios are reported in our findings. These are:

(a) BY = Bav ÷ Av.Agg.Pay (5.10)

and

(b) BYNT = Bav Av.Agg.Pay. - Av.Tax. (5.11)

where Bav is the average of all single unemployment-benefit rates quoted during the year. Av.Agg.Pay. is the aggregate payout (including overtime, bonus earnings, etc.) for one week divided by full-time and part-time employees (average of April and October survey). Av.Tax is the average weekly income tax per labour force member.

Our hypothesised relationship suggests that both the level and duration of unemployment will be an increasing function of the replacement ratio.

A number of variables apart from BenY, are theoretically capable of shifting the relationship between S_L and S_L^s . However, in our experiments only the proportion of ineligible applications (INEL) proved statistically successful. This variable is designed to capture the effect on the rate of unemployment of changes in the enforcement of unemployment benefit eligibility rules. The variable was introduced for the theoretical reasons concerning the cost of waiting and job-search documentation. It is equal to the percentage of claims for benefit which are ruled ineligible during the year. We expect that when the authorities tighten eligibility rules, indicated by an increase in the rate of rejection of applicants, *ceteris paribus*, S_L^S moves closer to S_L as the cost of leisure (search) increases. As a result the unemployment rate will decline. Thus a negative coefficient is hypothesised.[10]

5.3 The Empirical Results

Most of the empirical work on the relationship between unemployment benefit and unemployment has been undertaken on the basis of a simultaneous equation system and estimated by the two-stage least squares procedure. This has been done to avoid simultaneous equation basis in the coefficients (Maki and Spindler, 1975). Tests performed in the New Zealand case showed that this was not a problem and that the most appropriate model was in fact a single equation system. This result was not unexpected. Christensen (1978) reported that Bodkin, in commenting on Braae's paper, pointed out that the two-stage least squares estimates presented by Braae showed little evidence of feedback in the simultaneous system of equations which comprised the model for New Zealand. He went on to suggest that consequently the ordinary least squares estimates were perhaps the more "accurate" estimates. In addition Gerard, Glejser and Vuchelen

5. Tests of Equation 5.1

Test	Dependent Variable: LogURT	LogURM	LogURF	Intercept	Independent Variables: BYNT	PCGDP	$PCGDP_{t-1}$	ILSET	INEL	$\overline{R}^2$	DW
5.1a		x		0.791 (0.595)	-0.074 (-2.241)	-0.268 (-5.265)	-0.045 (-0.822)	0.00126 (4.479)	-0.005 (-1.827)	0.859	2.360
5.1b			x	-1.770 (-1.830)	-0.052 (-2.143)	-0.255 (-6.889)	-0.052 (-1.303)	0.00091 (9.038)	-0.056 (-2.780)	0.947	2.110
5.1c	x			-0.069 (-0.056)	-0.066 (-2.168)	-0.266 (-5.641)	-0.043 (-0.847)	0.00102 (5.785)	-0.052 (-2.031)	0.892	2.360

NOTE: Numbers in parantheses beneath coefficients refer to t values.
Degrees of freedom = 15.
$\overline{R}^2$ adjusted for degrees of freedom.

(1978), in their study of Belgium, failed to find evidence that the ratio of unemployment compensation to the wage could be "explained" by the unemployment rate and therefore did not use a simultaneous equation model but a single equation, the parameters of which were estimated by least squares. This is the procedure followed in our study of New Zealand.

Equations 5.1a, 5.1b and 5.1c of Table 5 report the best results obtained in our attempt to explain the impact of unemployment benefits on the unemployment rate. We can see from the preferred equations that the results predicted by the theory are generally found with the exception of the impact of the replacement ratio. On the basis of these tests, the elasticity of the unemployment rate with respect to the ratio of benefits to (net) income, measured at the point of means, can be calculated.[11] These elasticities are -3.3 for males, -2.3 for females and -3.0 for the total. All of these elasticities are exceptionally high and highlight the difficulty of interpreting values of this kind. We may demonstrate this by taking one of these groups as an example. The mean of the total unemployment rate over the period is 0.70 percent. If both unemployment and the replacement ratio were at their mean levels a 10 percent rise in the replacement ratio would cause unemployment to drop to 0.47 percent. This represents a large relative change but only a small absolute drop in unemployment. To expect a similar percentage change when unemployment levels are very high is unreasonable. For example, in 1981

6. Tests with Equation Number 5.2

Test	Dependent Variable		Intercept	Independent Variables					$\overline{R}^2$	DW
	UDM	UDF		BY	RTGDP	$RTGDP_{t-1}$	ILSET	INEL		
5.2a	x		74.866 (6.6072)	0.385 (1.787)	-0.365 (-2.687)	-0.472 (-2.860)	0.00205 (4.902)	-0.05 (-0.542)	0.793	2.286
5.2b		x	75.780 (5.228)	0.563 (2.044)	-0.379 (-2.185)	-0.541 (-2.565)	0.00251 (4.691)	-0.004 (-0.036)	0.721	2.457

NOTE: Numbers in parantheses beneath coefficients refer to t values
Degrees of freedom = 15.
$\overline{R}^2$ adjusted for degrees of freedom.

the unemployment rate was 3.61 percent. BYNT was below average at 43.5 percent. The elasticity of unemployment to changes in the replacement ratio at this level of BYNT is -2.87. A 10 percent rise in the replacement ratio would now cause unemployment to fall to 2.57 percent.

Although our findings do indicate a negative relationship between unemployment and the replacement ratio the extent of this relationship is, intuitively, questionable. Certainly this is so for recent periods in which the unemployment rate has been well in excess of the average over the period of enquiry. Care must be taken, in interpreting the results. Further obersvation of the relationship at high levels of unemployment are required before the findings reported here can be confirmed.

Our results with respect to unemployment duration are more conventional. From tests 5.2a and 5.2b, reported in Table 6, we may calculate the elasticity of unemployment duration to changes in the benefit-income ratio as 1.16 for males and 1.5 for females (again at the point of means). This implies that if both variables were at their mean values, a 10 percent increase in the replacement ratio would raise the duration of male unemployment by just over one week and female unemployment by just over one and a half weeks. Again, however, the results will be coloured by the very long period of low unemployment that makes up the greater part of our period of observation. The two elasticities computed on the basis of 1981 durations and BY are 0.64 and 0.22 respectively. Nevertheless our findings do suggest that increases in the replacement ratio do give rise to an increase in unemployment duration. Again, however, caution is required when interpreting the results and further observations at high levels of unemployment are necessary to confirm the extent of the effect.

5.4 Interpretation of the Results

In general the results presented must be considered exploratory rather than definitive. The period through which New Zealand is currently passing is clearly one in which labour market changes of historical importance are taking place. However, although we cannot be confident of the accuracy of our computed elasticities, the general pattern of the results we obtained in our analysis is sufficiently consistent to suggest that increases in the ratio of benefits to income will be associated with reductions in the unemployment rate and with increases in the duration of unemployment.

Our results give rise to a significant problem of interpretation. How can the negative relationship between the unemployment rate and unemployment benefits be reconciled with (a) the large, significantly positive relationship observed in other countries (Section 3.3, Chapter 5) and (b) the positive relationship between unemployment benefits and the duration of unemployment?

To answer the first part of this question one must recognize that the New Zealand system of unemployment relief is substantially different to that in existence in the UK, the USA and Canada, countries in which strong positive relationships between unemployment rates and unemployment benefits have been found.[12] Three differences in particular are of relevance. All of them stem from the fact that the New Zealand scheme is a flat-rate benefit system as opposed to a variable rate insurance scheme. The first difference relates to effective coverage. Coverage in New Zealand is adversely affected by the income test. The income test is used to assess whether the family income has fallen below the level or levels which are accepted as being adequate, and in all cases the income of both the claimant and the claimant's spouse is taken into account. (This eligibility requirement effectively excludes most married women). Similar tests are not usually applied under unemployment insurance systems so that if individuals want to take "advantage" of the availability of unemployment insurance they are not prevented from doing so by the existence of an income earning spouse. It is this group that is most likely to respond to changes in the benefit because of the subsidy provided by their alternative access to funds - income earned by the spouse.

The second, and perhaps most important, difference relates to the size of the benefit. In Section 2, we noted that in the USA benefits are approximately 51 percent of gross earnings and in the UK the replacement ratio, for a household head with two children, was 66 percent in 1978. For New Zealand, by comparison, the average ratio of the single, flat-rate benefit to gross average earnings averaged only 29.3 percent over the period of our study. In Chapter 4 we argued that if workers have a short, decision-making time-horizon it is unlikely that they will be induced to become unemployed by changes in the unemployment benefit unless the benefit represents a significant replacement income. This requirement does not seem to be met in New Zealand. On the other hand, in countries where a positive relationship between benefits and the unemployment rate have been established, the existence of an earnings related benefit ensures that the replacement ratio will be sufficient to induce workers into leisure (or search).

Finally, the fact that New Zealanders do not contribute directly into the fund from which benefits are drawn, and do not have to spend a qualifying period in a job, may produce a psychological impact that impinges on the hypothesised relationship. Benefits, in New Zealand, are sometimes seen as a handout that many people are embarrassed to accept. In countries where benefits are related to contributions - either from the worker or the employer - and to qualifying spells of unemployment, the benefit may be viewed as a right which workers expect and which they are prepared to take full advantage of. The attitude to benefits in New Zealand may discourage workers from quitting even if the replacement ratio rose to a level great enough to call forth this reaction. (Unfortunately this attitude of New Zealanders to benefits might also discourage those who have become unemployed involuntarily from applying for a benefit to which they are eligible).

The theory developed in Chapter 4 may be used to reconcile the negative impact of benefits on the unemployment rate and their positive effect on the duration of unemployment. Increases in the replacement ratio may enable unemployed workers to extend their search for employment rather than be forced to accept the first job that comes their way. This results in workers obtaining a "better" job than would otherwise have been possible. If we assume that one of the characteristics of the "better" job is greater employment security then our findings are easily dealt with.[13] Individuals will not only obtain a job they are less likely to quit, because of personal dissatisfaction with the work, but, in addition, will have secured a job from which they are less likely to be dismissed in the future. Thus, we can expect the number of spells of unemployment experienced by these workers to be less than would have been the case in the absence of the higher replacement ratio. Without the increased benefits (relative to income), workers would have been forced, by financial circumstances to accept a job that was less secure and/or attractive just because it was the first offer they had obtained and their alternative resources were either exhausted or insufficient to meet their current commitments. The fall in the number of spells of unemployment experienced, a consequence of obtaining better employment, may conceivably offset the longer duration of the spells that are incurred in determining the unemployment rate. If this is so, the net result would be a fall in the unemployment rate despite an increase in the duration of unemployment. Unfortunately, this explanation cannot be more rigorously tested with the data currently available. We would need, for example, microeconomic data on both the number of spells of unemployment experienced by individuals and the duration of each spell.

Whether or not the foregoing explanation is correct, our findings are at odds with the hypothesis that increasing unemployment benefits induce a significant increase in the consumption of leisure by workers who quit employment at the expense of taxpayers. What inducement there is, appears to result from an extension of unemployment duration by those who are already unemployed. Our interpretation of the evidence suggests that this extra time is utilized as search, not leisure, and therefore is beneficial as it produces a reduction in the overall unemployment rate.

Perhaps more importantly, however, our results disagree with the major expectation of most search theorists. Although evidence of increased search activity by the unemployed is found, the findings run contrary to the assertion of search theorists that benefits will induce employed workers to quit. The negative coefficient for the replacement ratio in tests of the unemployment rate, in tandem with the positive coefficient in tests on duration, suggests that quits became less common as benefits rise and therefore do not contribute to increases in the level of unemployment.

6. CONCLUSION

In this chapter we have discussed the nature of the New Zealand system of unemployment compensation and compared its characteristics with those of other countries. We have noted that there are some significant differences. For example, with the exception of those under 16 years of age, the benefit is available in New Zealand to all who qualify. However, a very restrictive income test generally disqualifies most married women. Unlike many overseas systems, the New Zealand benefit is not earnings related nor financed by contributions but is a flat-rate benefit paid out of the general tax pool. To some extent these, and other, differences may help explain why the findings of the last part of the chapter are at odds with similar studies completed elsewhere.

Our tests of the model developed in Chapter 4, utilizing New Zealand data, indicated that increases in the replacement ratio were associated with increased unemployment duration but a reduction in unemployment rates. From a policy point of view, it would appear that, in the quest for the minimization of the welfare costs associated with business cycles, low unemployment and high unemployment benefits can be, to some degree, complements (rather than substitutes as argued by Grubel _et al._ (1975)). Clearly there must be a socially optimum level of unemployment benefits relative to income available from work. Over some range, higher benefits increase both the welfare of benefit recipients and the welfare of society as workers and jobs become better matched with a resultant increase in aggregate output of market goods. However, the overseas evidence suggests, as benefits rise, a point must be reached at which induced unemployment becomes a distinct possibility and society begins to experience welfare losses as the welfare gains of the recipients continue to rise. Consequently there must be a level of benefits at which equality of the gains and losses at the margin assures optimality. Of necessity the proper level of benefits will be the result of value judgements but the quality of these judgements could be improved by appropriate research.

Our findings suggest a movement toward an earnings related benefit might be appropriate. The workers our economy would most want to encourage to undertake a longer period of search are those whose normally higher incomes suggest they are the most productive. It is in society's interest to ensure that such workers are employed in positions where the economy as a whole can benefit from their high productivity. Low unemployment benefits may be having the effect of forcing talented people into jobs where their skills are not fully utilized. This cost may exceed any gain from low benefits in discouraging low paid workers from becoming employed.

An objective of this chapter was to extend the analysis undertaken by Braae (1978). Our findings indicate that the increase in unemployment rate since 1976 is not even partially the result of inducement into unemployment resulting from increases in the unemployment benefit. Indeed, our findings suggest that the reverse is true, i.e. lower unemployment benefits have contributed to the rise in unemployment. Although we initially considered the effect of fiscal drag to be important the results do not support this. Indeed the inclusion of the BYNT variable only serves to emphasize the negative relationship between the unemployment rate and benefits. If anything, we would have expected the inclusion of BYNT to have had the opposite effect. One possible explanation for this is that unemployment benefits in New Zealand are now taxable.[14] This would mean that fiscal drag would have only a minor effect on increasing the replacement ratio.

Analysing the impact on unemployment by sex provided some interesting results. The variation in unemployment rates was more easily explained in the case of females while the duration of unemployment was more easily explained for males. The elasticities with respect to changes in the replacement ratio were greater for males. It was, however, for females that the impact of the replacement ratio on either the unemployment rate or the duration of unemployment was mostly commonly significant from zero in the tests carried out. This was particularly true with respect to duration.

Of the range of other variables tried, with respect to shifts in the gap between S_L and S_L^s, only INEL proved to be important and then only when considering the unemployment rate. This is possibly because when we used duration data we were dealing with individuals who had already passed the eligibility requirements. Maki (1977) suggests that a more relevant variable would have been diaqualifications. This, however, was not available and in any case both the number of applicants ruled ineligible and the number of recipients disqualified should move together as the authorities tighten or relax administrative procedures.

Our most important conclusions are, however, that the evidence provides no support for the labour-leisure choice argument of inducement into unemployment as a result of benefit increases. In addition, the results also seem to run contrary to the major expectation of search theorists that increases in unemployment rates can be induced by higher benefits which encourage workers to quit their existing jobs and go in search of jobs offering higher pay.

NOTES

1. Part of the analysis presented in this chapter has been published in Hicks and Chin (1984b).

2. The replacement ratio is the technical term which we will continue to use for the ratio of unemployment benefits to average income.

3. The ratio of single beneficiaries to married beneficiaries was just over 3 to 1 in 1974 (Department of Statistics 1975) and had risen to nearly 5 to 1 by 1982 (Department of Social Welfare 1983). A fall in either the duration of a spell of unemployment or the real value of the benefit might also retard the growth in total real expenditure but over the period of our study duration has increased (Chapter 7) as has the real value of unemployment benefits in Table 2.

4. This estimate is based on the regression result

$$\log E/O = -8.73 - 0.94 \log UR$$

where E is total expenditure on benefit,

O is Gross Domestic Product,

UR is the registered unemployment rate.

5. Of course our current enquiry is unable to determine whether or not increased registered unemployment has resulted from a real increase in unemployment or merely an increase in the propensity to register as unemployed.

6. As in any enquiry of this sort, a number of variables will be experimented with which prove unsuccessful. We have decided not to report such experiments in detail and to comment only briefly on them in footnotes. Two alternatives dependent variables were tried with respect to the unemployment rate, the number in receipt of benefit and, from Chapter 8, the number whose unemployment was estimated to be the result of factors other than deficient demand. Both variables were expressed as a percent of the labour force but neither could be adequately explained by our model.

7. A person who is eligible for benefit has little incentive to forego receipt of it for longer than is made necessary by the statutory stand-down requirement. In addition the mean value of average duration on unemployment benefit for the period of our study was 9.7 weeks for males and 11 weeks for females. Thus we think our assumption less heroic than it may first appear.

8. It was found necessary to use a variable such as ILSET because simpler proxies, such as participation rates or changes in participation rates, were dominated by trend factors and therefore performed badly when used in our empirical work. Another labour supply variable that did not prove successful was net migration. Walsh (1978) had found this variable important in his analysis however, when included in either (5.1) or (5.2) it did not improve the explanatory power of our model.

9. See Figure I, Chapter 4 and the explanation of the diagram provided in Section 3.3 of Chapter 4.

10. Other labour friction variables used without success included: the ratio of maximum benefit during the year to gross and net income, real hire purchase debt per worker, permanent income (as calculated by Cubbin and Foley (1977)) and an index of employment opportunity based on registered unemployment and vacancy figures.

11. The decision to estimate the elasticity at the point of means is arbitrary. However a choice is necessitated because of the fact that our model, both for unemployment rate and unemployment duration, does not assume a constant elasticity.

12. See in particular, Maki and Spindler (1975) Grubel, Maki and Sax (1975) and Grubel and Maki (1976).

13. The non-monetary aspects of jobs, such as greater security of employment, may be thought of as producing a "psychic income" which is included in the slope of the budget constraint.

14. About 80 percent of unemployment benefits are taxed as recipients do not have the care of dependent children. It is estimated that tax on unemployment benefit returns about 11 percent of gross expenditure (Department of Social Welfare, 1983, p.5.).

CHAPTER 11

SUMMARY AND CONCLUSIONS

1. INTRODUCTION

In this, the concluding chapter of the thesis, we will briefly summarize our major findings and present some of the implications our findings have for policy and future research.

2. THE "NEW" UNEMPLOYMENT AND THE NEW ZEALAND EXPERIENCE

High levels of unemployment have not been a persistent problem of the New Zealand economy. Unlike the experience of many other countries, the official unemployment rate, based on registration data, has averaged only 0.17 percent over the past 20 years. Even when corrected to allow for assumed errors in measurement the average rate over the period of our study is only 1.7 percent. Admittedly, this is ten times the size of the official rate but, it still compares quite favourably with the experience of other western economies. Of greater importance, is (a) the rate of increase in unemployment after the mid 1970s and (b) its inequitable distribution. Both of these factors have combined to produce an unemployment problem which, in the mind of many New Zealander's, is unacceptable and, therefore, a matter of increasing public concern.

In explaining unemployment, the traditional Keynesian framework emphasized the inadequacy of aggregate demand as the source of the problem. However, during the 1970s, a "new" view of unemployment developed based on the premise that the Keynesian picture of a hard core of unemployed workers who are not able to find jobs is an inaccurate description of the economy and, therefore, a misleading basis for policy. The advocates of the "new" view of unemployment believed that a more accurate description is an active labour market in which almost everyone who is out of work can find his usual type of job in a relatively short time. Although there are a number of distinct theories pressing the claim that much of the unemployment is voluntary and of short duration, the theory of job-search has become the most widely accepted.

That the Keynesian explanation of the causes of unemployment became less relevant in the post war period is to be expected. In many countries, economic conditions were such that only occassional lapses from "full" employment were experienced. When such lapses did occur, the appropriate dose of expansionary monetary or fiscal policy was able to move the economy in the desired direction. Economists, who were interested in the issue of unemployment, largely turned their attention to explaining the unemployment that exists at "full" employment. The definition of full employment varied but we shall now define it as the level of unemployment that exists when the demand for labour (D_L) equals the supply of labour (S_L).

Conceptually,

$$D_L = E + V \tag{2.1}$$

and

$$S_L = E + U \tag{2.2}$$

where

E = employment,

V = vacancies,

U = unemployment.

Labour market equilibirum can therefore be expressed as

$$E + V = E + U \tag{2.3}$$

$$V = U \tag{2.4}$$

The task for economists was, therefore, to explain the simultaneous existence of vacancies and unemployment. The theory of job-search was not only able to fill this role but, in addition, was also able to explain why the full employment level of unemployment could not be permanently lowered by an expansion of aggregate demand.

The "new" theory appeared to accomodate the known facts on unemployment. In the US, during the late 1960s and early 1970s, unemployment duration was considered to be quite short, job turnover was high and the majority of separations from jobs were voluntary.[1] In the UK, Australia and New Zealand, at this time, the importance of non-demand-deficient unemployment in total unemployment was also consistent with the search hypothesis.[2]

Beyond the early 1970s, however, western economies began to experience both rising prices and higher levels of unemployment. Search theory, which had been increasingly refined during this period, was invoked to provide the answer to the stagflation conundrum with little consideration being given to the changing factual circumstances. The rise in unemployment was attributed to an increase in the natural rate of unemployment generated by a change in the search behaviour of workers; while the worsening inflation, originated with the futile attempts to lower unemployment via an expansion of demand.[3]

This thesis has analysed New Zealand's unemployment experience over the period 1960-1981. In particular, we have been concerned with testing the relevance of the search hypothesis as an explanation for the rapid rise in unemployment that has occured since the mid 1970s.

The diagramatic representation of the search model we presented in Chapter 3, emphasised that, to be attributable to the job-search behaviour of workers, unemployment should be of relatively short duration and able to be classified as non-demand-deficient. As we noted above, the overseas evidence, and indeed New Zealand evidence, was consistent with the search hypothesis through the '60s and early '70s. However, beyond the mid 1970s, conditions, both within New Zealand and elsewhere, had obviously changed. In New Zealand, by

1981, only 7.6 percent of total unemployment could be classified as non-demand-deficient and, on average over the period 1981 (March) to 1983 (July), nearly 50 percent of unemployment was accounted for by spells in excess of 3 months. Overseas, similar studies of unemployment duration were pointing to the increasing importance of long spells and, in addition, to the problem of multiple spells.[4]

In Chapter 4, we extended our simple model of search in order to develop two additional tests of the potential importance of changed job-search behaviour as an explanation for the rise in unemployment. The first, was based on the hypothesis that higher unemployment benefits offered an increased subsidy to search resulting in both an increased duration of unemployment and an increased willingness to become unemployed. The second, argued that for unemployment to be attributable to increased job-search, a shift in the relationship between unemployment and vacancies must be observed.

Performing these tests with New Zealand data, produced results contrary to the expectation of search theory. In addition, the results were, at least superficially, different to those obtained elsewhere. However, it is not difficult to reconcile the New Zealand results with those obtained overseas. First, our tests with New Zealand data relate, in general, to a later period of time than the work surveyed in Chapter 5. Conditions of (near) full employment existed for only part of the period covered by our investigations, whereas most of the other studies reported do not include a significant period of unemployment. Second, the tests reported in Chapter 5 are not identical with those we have conducted. With respect to the UV relationship, only Parikh (1982) was concerned to test for errors in the measurement of variables. He concluded that measurement errors were important and although he also found that real factors had contributed to the shift of the UV curve, he was unable to determine whether they operated from the demand side or the supply side. As explained in Chapter 10, different institutional arrangements probably account for much of the difference in our findings with respect to the impact of the unemployment benefit and those reported overseas. Indeed, to the extent that the significantly positive relationship between the unemployment rate and unemployment benefits observed overseas derives from the higher replacement ratio in those countries, our theoretical proposition, that workers have a short time horizon, is supported. In itself, a short time horizon is at odds with search theory which argues that individuals are capable of, and willing to, maximize their welfare over an extended period of time.

Our conclusion, with respect to New Zealand, is that, on the basis of the tests we have performed, increases in search activity have not even been a partial cause of rising levels of unemployment.

3. POLICY IMPLICATIONS AND FUTURE RESEARCH

3.1 Introduction

The empirical analysis contained in Part 3 of the thesis raises a number of theoretic, empirical and practical issues. In this section we briefly examine some of the questions that remain to be answered and the policy implications of the "answers" we have obtained.

3.2 Policy on Data Collection

At every stage of our research, data problems impinged on both the method of analysis and the quality and reliability of the results. Social scientists have come to expect a certain amount of difficulty with data in conducting their empirical work, however, labour market analysis in New Zealand is particularly heavily burdened by the paucity of extensive, reliable information with which to conduct experiments. From the parochial perspective of a labour economist this is frustrating. From society's point of view, however, the lack of data means that gross inefficiencies in the use of at least one factor of production, labour, are going undetected and therefore have little prospect of receiving appropriate remedial action. As Braae and Gallacher (1983) have remarked, "This is not just a matter of concern for researchers. Unemployment is one of the key variables by which government economic policy is formulated and judged. Accurate information, therefore, is essential."

The adoption of a quarterly labour force survey is therefore recommended. The format of the survey should be such as to enable, not just an accurate estimate of the major aggregates such as the labour force and level of unemployment, but the collection of detailed information, both cross-sectional and longitudinal, on all aspects of labour supply. We have identified several areas of need. First, there exists virtually no micro level data on the characteristics of the unemployed which would permit researchers to readily determine whether the distribution of unemployment is associated with any clearly identifiable set of influences or personal characteristics. The conclusions we have reached on the impact of unemployment benefits, for example, are based on the available aggregate data. In addition, we were unable to test the reservation wage - unemployment duration hypothesis because of the lack of detailed data at the micro level. With respect to other theories of unemployment the data paucity would also be a problem of some concern. For example the segmented labour market theory, which argues that allocation to the secondary labour market (and thereby exposure to a high unemployment probability) is based on an individuals ascribed characteristics, would be difficult to test with Department of Labour data.

Second, in addition to supplying us with information on the characteristics of the workers experiencing unemployment, the survey should also be designed to provide information on the characteristics of the unemployment that the workers are experiencing. In particular, we require information on the initial cause of unemployment spells. For example has the individual's unemployment spell resulted from the worker quitting, temporary lay-off, permanent lay-off, redundancy, re-entry or new entry to the work force? In addition, information on both the incidence of spells and the duration of spells is required.

Finally we require information on the relationship between the individuals unemployment experience and his previous and subsequent labour market status. In other words,we require data on labour flows between the various states of employed, unemployed and not in the labour force.

Many commentators have made a similar call for the implementation of a labour market survey in New Zealand.[5] The estimated cost of $250,000 per annum (Easton 1983) is, apparently, politically unacceptable. However, it is hard to imagine that this monetary cost outweighs the potential benefits of a substantially improved understanding of an important section of the New Zealand economy.

3.3 Implications For Economic Policy

Despite the constraints imposed by inadequate data, our results enable us to make some comment on strategies for dealing with the unemployment problem in New Zealand. First, the assertion that most unemployment is the result of voluntary job search and therefore a trivial problem from a welfare perspective is rejected. The predominance of demand-deficient unemployment and the high estimated contribution of long-term unemployment spells to total unemployment is convincing evidence of the very real difficulty workers have in obtaining jobs. In addition, the absence of a positive relationship between the unemployment rate and increases in unemployment benefits suggests that New Zealand workers are not prepared to quit existing jobs in order to take advantage of a period of subsidized search (or leisure). Thus a policy of do nothing is totally inappropriate. Rather than representing productive investment in job-search, New Zealand's unemployment is a flagrant waste of valuable human resources. Active intervention in the labour market is required to get these people who want to work, back to work.

Second, the relevance of the notion of the natural rate of unemployment (in the Friedman - Phelps sense) is severely brought into question by our results. Not only does the existing level of unemployment appear to stand well in excess of what might reasonably be considered "natural", but our evidence indicates that there has been no increase in frictional or structural rigidities to prevent expansionary monetary and fiscal policies from obtaining a long-run reduction in unemployment. In other words, there is no reason to believe that the existing level of unemployment is immune to aggregate demand management because of the existence of a long-run vertical trade-off between unemployment and inflation. In stating this, we do not deny that other considerations may hinder the implementation of the appropriate remedial action. What we do claim, however, is that structural and frictional problems, particularly those associated with the search activity of individuals, will not prevent expansionary economic policies from attaining their objective.

Third, our research suggests that training and retraining schemes will be of little use in reducing the total number of jobless.[6] Given the immense gap between the number of unemployed and the number of vacancies the obvious response to proposals for retraining is to ask the question - retrained for what? If the existing number of jobs available is insufficient to absorb all of the current unemployed then the best that training programmes can hope to achieve is a redistribution of unemployment. To the extent that unemployment is concentrated within specific disadvantaged groups (see Chapter 2) any redistribution of unemployment that results in a more equitable distribution of the burden is to be encouraged. However, segmented labour market theorists argue that the observed mal-distribution of unemployment is attributable to the ascribed characteristics of individuals (such as sex, age, race and status) rather than to attained characteristics (such as education, training and experience). To the extent that this hypothesis is correct, training and retraining schemes will not even have a beneficial impact on the distribution of unemployment.

The job-creation schemes of the Department of Labour are, conceptually, more soundly based.[7] Under conditions in which the major obstacle to employment is the lack of jobs, any move to create new jobs represents a step in the right direction. However, in practice, too few jobs are created and their duration is strictly limited. These restrictions result in the programmes being less effective than they might otherwise have been.

Finally, our analysis of the operation of the New Zealand system of unemployment benefit payments and the impact the system has on labour market activity leads us to conclude that the system is overly restrictive both in terms of coverage and level of benefit. Wider coverage , through the abolition of the income test, and the payment of benefits related to earnings would help eleviate much of the stress, both mental and financial, created by a spell of unemployment. Unemployed workers would then be able to search for new employment opportunities in a more efficient manner.

3.4 Future Research

We have focused, in this thesis, on one theory of unemployment and a selected number of issues related to tests of this theory. As such, the work represents a small contribution to the on-going research programme into New Zealand's unemployment. Much remains to be done. While we have been able to provide some answers, our work has also given rise to a number of questions, attention to which lies in the future. First priority is the search for an empirically sustainable theoretical explanation of the unemployment phenomenon in the New Zealand case. In the absence of a realistic model, policies to eliminate unemployment will tend to be ad hoc and, possibly, at cross purposes. Our findings indicate that an acceptable theoretical model will probably be couched in disequiblibrium terms and emphasise the inadequacy of the demand for labour and its causes. In addition, it will incorporate an analysis of the foreign trade sector as New Zealand's adverse Balance of Payments position presents an obvious obstacle to expansionary policies under a fixed exchange rate system.

An analysis of the constraints imposed by an increasing international indebtedness on the ability of the Government to expand, or even maintain, the level of aggregate demand is a subject worthy of examination in its own right. We need to know, for example, the extent to which attempts to raise the level of demand result in rising imports (or a reduction in goods available for export) and therefore a deterioration in the country's Balance of Payments. If the cost of a worsening oversea's account outweighs the improvement in employment then alternative means of coping with unemployment must be found. It is commonly believed that devaluing the exchange rate will result in a more satisfactory Balance of Payments position and, consequently, enable the Government to pursue more vigorously policies to reduce unemployment. However, Chatterjee and Michelini (1983) have recently suggested that a devaluation will worsen the Balance of Payments in the New Zealand case rather than improve it. In addition, because much of the capital equipment and raw materials for manufacturing are imported, a devaluation may result in an increase in unemployment as firms faced with a higher cost of inputs close down. The employment effect of a devaluation is therefore an item that should be added to the current research agenda.

If the factors mentioned above prohibit a general expansion of demand, an alternative may be to concentrate on raising employment in industries which may contribute to an alleviation of the pressure on the external deficit. Such industries may be either exporting or import competing. Research aimed at identifying viable industries in either of these groups is required. In addition, knowledge of the employment potential and training requirements of the specified industries is required so that the Government knows on which industries to concentrate and what action, if any, is required to reeducate the work-force.

As was argued in the previous section, retraining itself will not reduce unemployment. It may, however, be necessary to allow unemployment to fall as demand rises if the jobs newly created call for skills not already provided by the New Zealand work force. In the mean time, however, there is some possibility that retraining may be effective in redistributing the burden of unemployment in a more equitable manner. Research needs to be undertaken to ascertain the extent to which retraining is likely to result in the predicted change. Tests of the theory of segmented labour markets would seem to be important in this regard. If, as predicted by the theory, allocation to the secondary sector results from discrimination on the basis of the ascribed characteristics of individuals, training and retraining schemes will have little or no impact. Under these circumstances, an improvement in the employment position of society's most disadvantaged groups will rest on the creation of more "good" jobs in the primary sector, an event that is only likely to occur with a general expansion of demand.

4. CONCLUSION

Our study of New Zealand's unemployment has shown that a problem of considerable magnitude exists. Attempts to explain the phenomenon as a voluntary, rational response by workers are quite unconvincing. Rather, New Zealand's unemployment appears to result from a chronic deficiency of aggregate demand and although much more research is required before specific policy prescriptions can be advocated, it is clearly unreasonable to continue to accept that New Zealand's unemployment is in any sense "natural" and, by implication, trivial.

NOTES

1. See Feldstein (1973).

2. See Hughes (1974), Hicks (1977) and Chapter 8.

3. Solow (1975 and 1980) was one economist who warned against using theories that explained unemployment as voluntary and rational when empirical evidence showed otherwise. He wrote, "... It is a mistake to tie yourself into intellectual knots trying to make unemployment a rational occupation." (Solow 1975 p.340); and "... a reasonable theory of economic policy ought to be based on a reasonable theory of economic life" (Solow 1980 p.10).

4. This research is fully documented in Chapter 5. However, of particular importance was the work of Akerlof and Main (1980), Trevedi and Baker (1982) and Hason and De Broucker (1982).

5. See for example Poot and Brosnan (1982) Braae and Gallacher (1983) and Easton (1983).

6. Schemes in this category include; the Work Skills Development Programme (ESDP), Schoolleavers' Training and Employment Preparation Scheme (STEPS) and Young Persons Training Programme (YPTP).

7. These schemes include, the Additional Jobs Programme (AJD), the Private Sector Employment Incentive Scheme (PSEIS) the Farm Employment Scheme (FES), and the Project Employment Scheme (PEP).

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