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DEVELOPMENTS IN THE
YOUTH LABOUR MARKET
IN POST-WAR BRITAIN

BY

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THESIS SUBMITTED FOR THE DEGREE OF
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This thesis is dedicated to:

My wife Hilary

DECLARATION

I declare that no portion of the work in this thesis has been submitted in support of an application for another degree or qualification of this or any other university or institution of learning.

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ABSTRACT

This study aims to investigate post-war developments in the British youth labour market, with particular reference to both the behaviour of this group's unemployment through time and its distribution cross-sectionally. It is motivated by the concern expressed in virtually all quarters in recent years about the apparent failures of this particular market to provide an adequate introduction to working life for the young of the nation. This worry relates not only to the loss of current output that joblessness entails, but also to its potential longer term personal and social consequences.

The substantive part of the work commences with a review of recent theoretical developments in the unemployment field and attempts to assess the relevance of these for the young. As in all areas of economics, the concept of price is central to the study of the employment fortunes of the workforce and the empirical analysis commences with a time-series examination of relative youth pay. This is then followed by an investigation of the temporal, aggregate and industrial, employment patterns of the young; factors which clearly can have a vitally important bearing on their unemployment behaviour.

Direct analysis of joblessness amongst British youth then begins with a detailed aggregate time-series study of both their percentage rate of unemployment and its level relative to that of older participants in the market. However, young workers, like most other groups, are far from homogeneous and therefore knowledge of the extent of unemployment faced by them says nothing about how it is distributed amongst their number. The direct analysis of youth

unemployment is, for this reason, extended to a micro-study of the influences which help determine how the burden, if such it be, is spread amongst them. However, this aspect of the work is not entirely static and the issue of whether the distribution is constant through time forms an integral part of the work.

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CHAPTER 1

INTRODUCTION

I. PROLOGUE

Britain emerged from war in 1945 a badly bruised but generally optimistic society. Beveridge offered opportunity to the nation's young, a thorough-going extension of social insurance coverage, free health service and more.⁽¹⁾ Furthermore, full employment was held to be a goal that was realistically attainable. Notwithstanding the traumas of reconstruction the trend towards all-round prosperity appeared to establish itself fairly quickly and much of the recent historical experience - war and Depression - seemed destined only for the memory. Indeed by 1957 the then Prime Minister, Macmillan, felt able to declare that "You've never had it so good."⁽²⁾

But all, of course, was not quite as rosy as the politicians would from time to time claim. However, the problems were of a kind having clear meaning only to the informed. Whilst seemingly still a member of the world's elite economic community, Britain "lacked competitiveness", possessed an "over-valued" currency, and suffered "runs" on its gold resources. Such macro-economic phenomena appeared of little relevance on the shop-floor to those seeking "only" faster real-wage growth. True this quest appeared to many to underlie the "British disease", but then Turner (1969) told us that strikes might not nearly be so costly as they appeared at first sight. But by the mid-1970's the country's weaknesses did begin to manifest themselves in ways whose importance was evident to many even though their causes, let alone remedies, were still understood by very few.

In particular, Britain, along it must be said with many other Western countries, began to suffer levels of unemployment unprecedented in the post-war era. For some memories of the 1930's

were enlivened, for others the reminiscences of the media and of elder citizens began to acquire poignancy. In fairly quick succession one "potentially unacceptable" unemployment level after another was exceeded until, by the beginning of 1983, more than three million people were officially recorded as being out of work. But attitudes towards unemployment have not apparently changed amongst the public with some 58 per cent of a Market and Opinion Research International (MORI) sample regarding unemployment as the major issue affecting their voting intentions.⁽³⁾

Mass unemployment has returned and

"we know that mass unemployment affects the whole fabric of society."
(Malinvaud (1984) p.1)

But successive British governments have seemed amongst the least able to turn the tide. Disturbingly also, economists were woefully inadequately equipped to provide the answer to the questions asked by them as recession set in and then deepened. Conventional text book tools were patently inadequate, the Phillips curve was not a simple "menu for policy choice" (Rees (1970)) and rudimentary discussions of the natural rate of unemployment held little popular appeal. In short,

"Economics as a science has failed at this moment in history to convey to the general public a useful message on what ought to have been done in order to contain unemployment."
(Malinvaud (1984) p.113)

But on top of the concern felt regarding the overall magnitude of unemployment, about which governments have been accused of complacency from several quarters, there evolved a growing awareness of the potential problems surrounding its distribution through the work-force. One of the major aspects of this has been how the

recession has affected young people, and the allied considerations of what the long-term consequences may be upon them, which seems all the more pertinent when they have been described as comprising "Seventy Per Cent of Our Future" (Baxter and McCormick (1984)). On this particular aspect of the recession governments have received somewhat warmer praise than over most others,

"Yet there seems to be more of a consensus when it comes to the fight against youth unemployment. Regardless of political colour every OECD government recognises the value of vocational and social insertion of young people and the inherent risks of short - and long-term youth unemployment. Consequently almost all countries have enacted special youth programmes and policies."
(OECD (1984a) p.8)

However, the problem remains at almost crisis level. Thus in 1984 unemployment amongst the under 18's never fell below 205,300 whilst in 1971 it never rose above 98,000, in spite of the fact that extensive job creation measures were in operation in the later year. Furthermore, this group held over 300,000 fewer jobs in 1981 than they possessed in 1971. Whilst the problems confronting modern youth in the labour market are attracting a good deal of scholarly attention, little has yet been settled. The aim of the present work is therefore to consider certain of the central issues in the debate, with the principal focus being on the failure criterion of unemployment. Firstly, however, the question of just what is meant by the term youth in an economic context should be raised.

II. ECONOMIC YOUTH

The general thrust of dictionary definitions of youth are that it is the state of being young or before adult age. But this

only leads one to ask what is meant by "young" and "adult". Furthermore, there is not even an agreed administrative definition of youth and those undertaking empirical studies of their labour market position have felt themselves able in some instances to focus on a very narrow band beyond the school-leaving age, in some European work to extend this up to the age of 30 and in the remainder to adopt a variety of intermediate postures. Can then the application of economic reasoning aid in bringing about something more akin to consensus on this matter?

One approach might be to ask whether a definition based around labour market entry is useful. Initial reaction might lead to an affirmative conclusion as it seems to capture the school-leaver perfectly.⁽⁴⁾ However, it also ensnares some married females who only enter the labour force for the first time in later life. Indeed it is a moot point as to how one would treat those who had simply had a prolonged absence from the labour force in this framework.⁽⁵⁾ Also, are 18 year old school-leavers the same as those who leave school at 16 and how should those who have undertaken higher education be treated? The only escape seems to be to adopt an age criterion in conjunction with that regarding labour force inexperience; but then we are back where we started.

Another approach might be to define youths as those with tenuous labour market attachment. But, on the one hand, this is to accept a hypothesis about the behaviour of young people; albeit one which has received some empirical support. Equally, on the other hand, it is to ignore the fact that certain other groups are also assumed to share this characteristic - second family earners being the typical case in

point. Furthermore, this categorisation ignores the possibility that some young people behave truly as "economic youth". That is, they may wish to demonstrate labour force attachment at an early age as an investment decision, whether on human capital or signalling grounds. Once again therefore it is not obvious that progressing along this route would result in substantial advance.

In a related, although conceptually distinct, vein one might look for a definition of youth based upon skill level, or perhaps efficiency units. The apprenticeship system might seem to afford some weight to this possibility. But people below a certain age are not the only individuals in the labour market who do not embody a "full" vector of past investments in skill acquisition.⁽⁶⁾ In other words, the unskilled do not comprise simply the young. But, in addition, this line of argument glosses over the role of the formal education system in the development of marketable skills. If this is a primary role of schooling, as some would argue it is, then the young might bring to the market more relevant, if only embryonic, skills than those possessed by some members of older cohorts. Defining youth in these terms would therefore also not appear to be straightforward.

This very brief consideration of how one might go about defining youth in an economic sense has perhaps been sufficient to indicate why the problem has received so little attention in the literature. Indeed this preliminary discussion might lead one to inquire whether attention should be focused specifically upon the problems of youth in the labour market at all, rather than those of the unskilled or secondary workers in general. However, this stance is not the one adopted here, where the policy-maker's attention to the supposedly special problems faced by young people constitutes the prime-mover of

the work. Indeed the difficulty of formulating an exact definition of youth in economic terms need not negate the finding that, roughly speaking, young people suffer distinct market disadvantage. In line with previous research, the approach taken to the group under study will therefore essentially be pragmatic and determined, in most instances, by the limitations of the data. With this in mind, the outline plan of the work is now presented.

III. OUTLINE

Unemployment is clearly not a problem faced by young people in isolation, and furthermore, the attention afforded to it has not simply been empirical. Indeed in recent years the economics profession has grappled hard with the perceived inadequacies of received neo-classical theory as a framework within which to rationalise contemporary labour market failings. Therefore, as a backcloth to the later, more empirically orientated aspects of the work, Chapter 2 reviews the, still essentially competing, modern theoretical developments in the unemployment field and queries whether they throw any special light onto the problems faced by the young.

One of the more popular hypotheses put forward to rationalise the persistent difficulties faced by youths in the labour market is that their relative wages are too high. This, of course, accords well with conventional economic reasoning. Indeed, it has even been proposed that government training schemes for unemployed youth, all be they well intentioned, are an actual waste of resources : all that is needed is (presumably less costly) action to bring down their relative wages.⁽⁷⁾ In view of this centre stage position held by relative wages in youth unemployment debates, Chapter 3 examines the time-

series data from which most commentators have drawn their evidence. The principal question, of course, is whether these affect the demand for young labour, and hence unemployment amongst this group, but in this initial examination of the data some attempt is made to examine whether, historically, relative youth wages have been sensitive to economic forces.

If the assumption is made that the labour force is fixed then the unemployment rate is the complement of the employment rate. This suggests that an examination of their employment patterns should form an integral part of the study of their unemployment. But even if this strict equality is relaxed, and flows into and out of the labour force recognised, it is clear that the demand for youth labour is central to the analysis of their labour market performance. In Great Britain there is a noticeable paucity of data with which to undertake this, and also previous, reasonably technical, approaches to the topic have achieved little by way of consensus. In view of this, Chapter 4 examines the employment of young people in the post war period via the medium of the Census of Population and brings to bear upon it a rather different analytical methodology to that normally applied. In some ways the emphasis there reverts to the traditional concern with structural unemployment; that is, can the poor performance of young people in some measure be attributed to a distinct employment distribution?

Chapters 5 and 6 then move onto the direct analysis of youth unemployment and subject its post-war behaviour to scrutiny. In the former, the development of the current problem is highlighted and hypotheses are produced to explain the extent of youth joblessness measured either as a rate percentage or relative to that

of adults. The latter then undertakes the task of subjecting the derived models to empirical test and examines in some detail the integrity of the results initially obtained.

But, as the distribution of the unemployment burden amongst any sub-population within the labour market, such as the young, has usually been found to be non-random, the determination of the aggregate level of youth joblessness at a point in time does not adequately parametise the problem at hand. It is necessary also to have some knowledge about how any given burden of unemployment will be spread amongst the members of the group, as distinguished by their identifiable characteristic vectors. This exercise forms the remit of Chapter 7 which examines the cross-sectional incidence of unemployment amongst young people. Following a discussion of the proposed model and the statistical problems encountered in looking at the employment/unemployment dichotomy across individuals, the analysis is conducted separately on two years of data. Thus, as in the time-series work, checks are provided on the stability of the findings and, in the light of the years chosen for analysis, some tentative remarks made possible about the neutrality, or otherwise, of the determinants of unemployment probabilities to the economic cycle.

Chapter 8 brings the work to a close with a detailed summary of the findings obtained and a discussion of the principal conclusions which emerge. What implications these latter may have for policy purposes constitutes an integral element of this second part of the closing overview.

- (1) Beveridge did not actually found the Welfare State contrary to much popular belief, see Wilson et. al. (1982).
- (2) Quoted in Cohen et. al. (1979).
- (3) Even allowing for statistical inexactitudes such findings are difficult to interpret when the government of the day had secured a second term of office in spite of presiding over a 2.5-3 fold increase in unemployment.
- (4) Even this is not quite true as those leaving school may have casual labour market experience.
- (5) Both of these difficulties apply to any who have been institutionalised (e.g. imprisoned) for long periods.
- (6) This begs the question of whether such skills are marketable anyway.
- (7) For a synopsis of these arguments see The Economist 12/12/81 pp.15-16 and 19/12/81 p.36.

CHAPTER 2

UNEMPLOYMENT : THEORETICAL ISSUES AND DEVELOPMENTS

I. INTRODUCTION

In this chapter the principal attempts made by economists in recent years to improve the theoretical apparatus with which to view unemployment are reviewed. Before doing this, however, Section II provides a very brief summary of the Keynes .v. the Classics debate and notes certain, comparatively early, important contributions to labour theory which figure prominently in most discussions. Section III then reviews the major equilibrium theories of unemployment to emerge in recent years and focusses on search theory, contract theory and benefit-induced unemployment in turn. Following this Section IV examines the disequilibrium treatments of unemployment which represent the principal attempt to cognise the belief that much joblessness is in fact involuntary. Finally, Section V provides a brief conclusion.

II. UNEMPLOYMENT AND THE AGGREGATE LABOUR MARKET

For over half a century the economics profession has been wrestling with the logical consequence of the classic Walrasian paradigm that the labour market will "clear", given fully flexible prices and wages. This was, of course, a mathematical conclusion but for many writers prior to the late 19th century it was a reasonable statement of the reality that surrounded them. In large part this was due to the presence of a large domestic/agricultural base which could "hide" what in later years would occasionally overtly appear as large scale unemployment. This is not to say that all were necessarily content with the outcomes of the market process. However, for the early writers much of their concern about the labour

market lay in the obstacles humanly imposed to hinder the fully fledged operation of the price mechanism. Thus,

"The policy of Europe, by obstructing the free circulation of labour and stock both from employment to employment, and from place to place, occasions in some cases a very inconvenient inequality in the whole of the advantages and disadvantages of their different employment."

(Smith (1910), p.122)

Such sentiments, of course, have found favour in many quarters within the current era. But it is probably true to say that we never have, and increasingly are less likely to, experienced free and perfect competition, especially within labour markets. How far our abstractions go in dealing with this remains a moot question.

Nevertheless, certain of the classical writers did openly consider the problem of unemployment. Jevons, for instance, wrote that:-

"The second disadvantage of the division of labour is that the individual system of society becomes highly complicated and delicately connected, so that any disturbance of supply and demand produces distress in one branch or other and it becomes difficult for any man thrown out of employment in one small branch to maintain himself in any other branch. That is an unquestionable evil and is an almost necessary result."

(Jevons in Collinson Black (ed) (1977) p.35)⁽¹⁾

Furthermore, Marx, amongst others, was aware of what were seen as the unemployment implications of a capital stock which failed to expand sufficiently fast to profitably employ the whole of the prevailing labour supply. But, however true, the interpretation of the classical doctrines as implying all unemployment to be voluntary and due to the idleness of the populace sparked off a counter offensive in the early 20th century culminating in Keynes' (1936) General Theory.⁽²⁾ The Great Depression had signalled the need for both fresh theorising and a new terminology when the labour market was under consideration.

Although, as Kahn (1976) noted, the phrase "involuntary unemployment" had been used, surprisingly, by the staunchest advocate of the classical logic some twenty years previously (Pigou (1914)), its standard, albeit convoluted, definition is that provided by Keynes (1936) p.15.

"Men are involuntarily 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."⁽³⁾

In the light of Pigou's (1943) "real balance" effect argument, the enhanced Keynesian system generated such unemployment in the long-run if, and only if, money wages were rigid.⁽⁴⁾ Within this framework, the demand side predominates with employers treating the fixed money wage as the marginal cost of changing employment and equating labour's marginal product to it.

Such a brief synopsis could never hope to do justice to such a great debate. However, one can infer from it the strong points of the opposing schools and also a common weakness they developed from the way the debate was conducted. The beauty of the classical system is that it is consistent with the received Walrasian micro-economic theory, at least in the long-run, with prices clearing all markets, including that for labour, and all real variables, including employment, being independent of nominal aggregates. This latter theoretical desiderata is seen by Hall (1980) to be clearly refuted by the empirical evidence (Barro (1977), for example). Whether the "natural rate" theorists' restatement of the classical model, to be outlined below, is a satisfactory defence remains at the centre of

debate. However, the Keynesian rigid money wage framework allows very simply for nominal effects on real magnitudes.

In the abstract, the difference between the two approaches can be highlighted by a mathematical representation of their respective assumptions. As this is now commonplace reference is simply made here to Modigliani's (1944) early, but lucid, presentation.

Such stark treatments point, however, to an unsatisfactory feature common to both models in their most basic form. This is that there is assumed to be a homogeneous labour market. In part, of course, this was due to the abstractions necessary to make the models "work". But for many years the debate was conducted as if this were true. In one sense, the classical revisionists, led by Friedman (1968), can be viewed as trying to rescue the flexible price model from the more extreme of its proponents by introducing the natural rate of unemployment. This was to account for

"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)

What is more, this so-called Chicago School aligned itself with the, historically comparatively sophisticated, writings of Fisher ((1896), (1920), (1930)) in recognising the short run influence of money on real quantities in transition periods. As Friedman objected,

"..... this recognition was not incorporated in formal theoretical analysis. The formal analysis simply took over Marshall's assumption. In this sense, the quantity theorists can be validly criticised for having 'assumed' price flexibility - just as Keynes can be validly criticized for 'assuming' that consumption is independent

of wealth, even though he recognised, in his asides that wealth has an effect on consumption."⁽⁵⁾
 (Friedman (1971) p.208)

And this classical resurgence was often conducted with that seemingly most Keynesian of expository devices, the Phillips curve.

At the end of the day, one was left with two schools of macro-thinking more noted for their similarities than their differences, as Clower (1969) for one, has noted.⁽⁶⁾ But what of the status of the labour market and, in particular, unemployment theory in the models? Labour economics had to a large extent persisted with the traditional classification of unemployment as frictional, seasonal, structural or demand deficient, with some non-trivial theoretical developments, particularly of the former, by Reder (1969). Also, new insights had been provided into the phenomenon of underemployment (labour hoarding) even in developed economies, by the works of Becker (1964), Klein (1960), Oi (1962) and Taylor (1970). Mincer (1962), on the other hand, had begun a school of research into hidden unemployment.

The macro theories, however, were still without solid micro foundation. Thus, Keynesians needed to explain why money wages were rigid. Monetarists, to use yet another of their allotted titles, still persisted with more or less an auction labour market, albeit with expected replacing actual real wages. What is more, whilst one might tease out of some of the micro theoretic developments how any given level, or more especially change in level, of unemployment might be distributed across the workforce the macro theories were almost wholly silent on the issue. This, of course, is crucial to the current study, and to many peoples' perception of current labour market problems.

From the late 1960's onwards the goal has been to find a macro theory of the labour market with acceptable microeconomic foundations. Overall, success has yet proved elusive, although along the way many useful insights have been provided into the (apparent) workings of present day labour markets. Whilst the distribution of any level of unemployment across members of the labour force has not occupied centre-stage in these developments, a short review of them and their potential contribution to such an analysis is now undertaken. The typology adopted is tight, although, as in the Keynes .v. Classics debate, the reality is much less so and many of the works cited encompass features outside of the compartment to which they are here allocated. This review is presented in two major sections, the first of which deals with equilibrium theories of unemployment and the second with the theorising which regards unemployment as the manifestation of disequilibrium somewhere in the economic system. In the former, two principal strands of reasoning are identified, which are those associated with search and contract theory respectively. However, both place a strong emphasis on the rate of exogeneously financed unemployment benefit and in consequence a separate sub-section will outline the controversies which have arisen over this issue. Similarly, the concept of human capital is crucial to most contract theories and, whilst it does not form a separate element of that particular sub-section, its importance is brought out and it will often be referred to in the later empirical work.

III. EQUILIBRIUM THEORIES

The class of theories considered here are based upon observed unemployment being the result of rational utility maximising behaviour and, to that extent, being ex-ante voluntary.

III.i SEARCH THEORY

The seminal theoretical works on the economics of search were actually those undertaken by Stigler ((1961), (1962)).⁽⁷⁾ However, for several years these appear to have been largely ignored and the main impetus to later work on search in the labour market was that which emerged as supportive of Friedman's (1968) natural rate of unemployment conceptualisation, in particular the volume edited by Phelps (1970). But, whilst Friedman's original verbal presentation seemed to allow of the possibility of some involuntary, or at least employer initiated unemployment, the vast bulk of the ensuing search literature concentrated entirely on voluntary frictional unemployment.

The core result, at least as far as simple macro-economic models goes, is normally seen to be that in the steady state (no surprises) the Phillips curve is vertical. That is, Rees' (1970) menu for policy choice becomes a set meal prepared to the taste of the host. But as Lippman and McCall (1976b) observe

"It is important that the unemployed searcher who has quit (because of his perceptions of alternative wages and the productivity of full time search) be distinguished from the unemployed searcher who was laid off. A cursory review of the Phillips curve literature indicates that the distinctions have not been made."

(p.359, italics in original)

Notwithstanding this failure to achieve theoretical Nirvana, the many contributions to the search theoretic debates have undoubtedly furthered labour economic analysis. Nevertheless, the following, short review of the search literature does indicate unsatisfactory elements even when the contributions are taken to be but partial theories of the labour market.

The basic idea is really a very simple and attractive one. It is that the world is full of rational, optimising economic agents but in which information is costly and both firms and workers must search in the "fog of imperfect information" (Muellbauer (1978)) to fill vacancies and to find jobs. The standard models proposed for both worker and employer search are of the sequential variety wherein search proceeds one sampling at a time and the situation re-appraised.⁽⁸⁾ Taking the searching worker as exemplar, the standard model form is based on the theory of optimal stopping, as detailed in De Groot (1970) for instance.

At their most basic the models assume that there are an infinite number of jobs, and therefore wages. To capture this it is posited that the individual faces a wage distribution with density function $f(w)$ and corresponding distribution function $F(\bar{w})$ where

$$F(\bar{w}) = \int_0^{\bar{w}} f(w)dw$$

and aims to maximise expected discounted life time income.⁽⁹⁾ The wage distribution is justified by invoking the assumption that whilst the workers skills are invariant, different prospective employers evaluate them unequally.⁽¹⁰⁾ Defining a time period as the length of

time within which one, and only one, job offer is received the current maximum worth of the searcher, given an infinite horizon, is

$$\begin{aligned} V(\bar{w}) &= \max [\bar{w}, E(V(w)) - c] \\ &= \max [\bar{w}, \int_0^{\infty} V(w) f(w) dw - c] \end{aligned}$$

where \bar{w} is the current offer and c is the unit cost of (one more) search. Furthermore, it can also be shown that

$$\bar{w} = \int_0^{\infty} V(w) f(w) dw - c$$

has a unique solution and this solution yields w^* , the reservation wage.⁽¹¹⁾ This is the value of w that makes the searcher indifferent between stopping now and continuing search. In models possessing the reservation wage property the optimal strategy is then to:

accept job if $\bar{w} \geq w^*$

continue search if $\bar{w} < w^*$

Another way of stating this is that search continues until the marginal cost of obtaining one more offer is just equal to the marginal benefit of so doing.

Couched in the latter terminology the formulation sounds eminently reasonable, and the mathematics is uncontested. However, further thought regarding the assumptions renders such models less than satisfactory when confronted with known labour market facts.

Thus, workers are assumed to know with certainty the parameters of the wage distribution that confronts them. The cost of search is assumed to be constant and the worker's utility function is taken to be linear.⁽¹²⁾ What is more, under the infinite horizon, contracts once struck are forever and quits and layoffs are not permitted. With these assumptions the reservation wage exists, is constant through time and the lower are the costs the longer is the expected period of search and consequent duration of unemployment.⁽¹³⁾

Considerable resources have, of course, been devoted to adding realism to search models, although as indicated by Hey (1979), the available options have tended to be covered piecemeal rather than attempts made at their joint, and several, inclusion in one overall unified model. An obvious point of departure is the relaxation of the infinite time horizon assumption. From a situation where the reservation wage is unchanging and the issue of recall irrelevant, the reservation wage now declines through time, whether the problem is formulated with or without the possibility of the recall of previous offers. Both Kasper (1967) and Stephenson (1976) found this assumption to be the more satisfactory for their American samples. However, the size of the effect found by Stephenson in a study focussed solely on youths was quite small. Lynch (1983) also uncovered a very small negative, and insignificant, decline in reservation wages in her study of London youths. However, the justification presented for this result is not altogether appealing, namely that the assumption of an infinite time horizon (and therefore constant reservation wage) for those at the beginning of their working lives is not too inappropriate.

First of all, if one does assume that all jobs once acquired are permanent attachments then the fact that youths hold jobs for relatively short periods of time cannot be incorporated. Short job attachments do not, of course, of themselves indicate a truncated horizon. It may be that successive jobs represent an anticipated progression, although there appears to be no evidence on this.⁽¹⁴⁾ Secondly, this supposition does not sit too easily with the finding in a companion paper, Lynch (1984), based on the same data set, where she finds evidence of negative state dependency.⁽¹⁵⁾ Basing her analysis on the work of Lancaster (1979), state dependency is said to exist if, after controlling for relevant personal and local demand characteristics, there is a decreasing hazard rate (re-employment probability) through time unemployed.⁽¹⁶⁾ The evidence unearthed is consistent with a world in which market signalling, as analysed by Spence (1974), is important and the longer the spell of current unemployment, the more adverse a signal it represents.⁽¹⁷⁾ Thus, "job snatching", in the terminology of Mackay (1972), may be an optimal strategy. More will be said on this when on-the-job search is considered.

A second amendment to the basic model comes from relaxing the assumption that one, and only one, job offer is received per period of time. The formulation of such less restrictive models has now become more commonplace, with the impetus in Britain being provided by the work of Lancaster (1979). Empirically, the relaxation of the one offer per period assumption has usually involved relating the probability that job offers are received, and therefore the duration of unemployment, to the overall level of unemployment as a demand

proxy.⁽¹⁸⁾ It is interesting to note that Lancaster and Nickell (1980) and Nickell (1979 a) find that, *cet. par.*, the probability of leaving unemployment is negatively related to age, when labour demand is one of the variables controlled for.

The foregoing improvement is similar to, but conceptually distinct from, a third refinement which appears desirable for most situations to which search theoretic analysis is applied. This is the recognition that economies are generally in a state of dynamic flux, and it might be expected that the wage distribution would shift with the state of the economy. However, wages seem notoriously sticky, and it would appear to be the probability of receiving a job offer which changes rather than the wage distribution *per se*. But to the extent that the wages of youths are cyclically more sensitive than those of adults, an issue investigated in more detail in the following chapter, a search theory modified to incorporate a shifting wage distribution may be of use in analysing their behaviour. But, in general, the issue of sticky wages is one area where the contract theories, to be discussed presently, score somewhat more heavily than search theories. This difficulty presents serious problems for search theoretic explanations of the negative slope of the short-run Phillips curve, as Lippman and McCall (1976b) realise.⁽¹⁹⁾ That is, if wages are rigid, then how are workers surprised? Furthermore, it can be noted here that search theory, in its simplest forms, is wrong about the behaviour of quits. It predicts they will increase in downturns, as wages in all but the worker's own firm will be perceived to have held up, and decrease in upturns, when own firm wage gains will be perceived as unique.⁽²⁰⁾ As Grossman (1973), in

an early critical appraisal of search theory argues "...non wage rationing of jobs is a pervasive aspect of declining employment for which analysis of employment - acceptance friction makes no apparent allowance" (p.1365). Of direct relevance, of course, is that author's work with Barro (1971) on non-clearing markets, which will be examined further below. However, whilst such analyses do not run into the voluntary unemployment problem, they do not offer fully convincing rationalisations of why markets fail to clear as Grossman (1973) admits.

The assumption that the searcher knows the relevant parameters of the wage distribution faced might also be regarded with some suspicion in many cases. Young people and others with limited recent labour market experience, such as married female re-entrants, represent obvious cases in point. For youths, in-school careers counselling might play a role in improving knowledge about wage distribution, although this issue has not been taken up in the literature. However, it is sometimes argued that their aspirations in the labour market are too high, which might be taken to suggest that the careers service does not devote sufficient resources to this particular task.

When the searcher does not know the wage distribution then the reservation wage is not constant.⁽²¹⁾ In effect each offer received provides information, with the aid of which the searcher updates both his conception of the prevailing wage distribution and his reservation wage.⁽²²⁾ Therefore, each job offer is not only an employment opportunity but also a piece of information used to update prior beliefs. At the opposite end of the spectrum, searchers may have rather a lot of information. In particular, they may realise

that the market is, at least partially, segmented in that they have a larger chance of obtaining employment in some firms rather than others. In this case they will not search randomly as the simple models suppose but search the most favourable firms first. In the specific case of young people, one manifestation of this might be a greater propensity for them to apply to, and be accepted at, firms where they have family or friend contacts.

Two characteristics possessed by individuals may also call the basic search models into question. The first of these is that in much theorising individuals are assumed to be risk-averse. Using the Arrow-Pratt measure of absolute risk aversion, Nachman (1975) shows the more risk averse individual will search less, and accept all offers accepted by those less risk averse plus some others. Furthermore, Hall et. al. (1979) indicate that the reservation wage property does not hold with risk averse individuals when offer recall is possible. But a casual presumption is that individuals grow more risk-averse with age, which might be taken as grounds for accepting search theory as more applicable to young people. However, there remains one possibility besides that of simple income maximising risk neutrality; that of risk-loving. This latter possibility has long been recognised, as the following quotation demonstrates:

"The contempt of risk and the presumptuous hope of success are in no period of life more active than at the age at which young people choose their professions. How little the fear of misfortune is then capable of balancing the hope of good luck appears still more evidently in the readiness of the common people to enlist as soldiers, or to go to sea, than in the eagerness of those of better fashion to enter into what are called the liberal fashions.

What a common soldier may lose is obvious enough. Without regarding the danger, however, young volunteers never enlist so readily as at the beginning of a new war;

and although they have scarce any chance of preferment, they figure to themselves, in their youthful fancies, a thousand occasions of acquiring honours and distinction which never occur. These romantic hopes make the whole price of their blood."

(Smith (1910), p.97)

Such notions have not been incorporated into modern day search theory.

Secondly, one might wish to take account of an individual's wealth position on his search activity.⁽²³⁾ The general presumption is that individuals should become more willing to accept offers of employment as their assets decline. In a search model this would be reflected in a declining reservation wage. The recognition of this feature might help to explain Kasper's (1967) finding that the rate of decline of the reservation wage as unemployment duration progressed was not positively related to age.⁽²⁴⁾ Where the problem becomes interesting with young workers is not so much that they may, in general, be regarded as wealthless, but rather how far their actions may be regarded as the outcome of a family joint utility maximisation exercise. If this is so then family wealth levels, other than simply that of the individual become relevant.⁽²⁵⁾ This is explored in a little more detail in Chapter 7.

Finally, the prevalence of models which do not permit on the job search is frequently objected to. This caveat would not be so disturbing if, empirically, job changes involved intervening periods of unemployment. Many job changes, however, do not involve any unemployment and therefore on the job search must be quite important, and successful. This point was made reasonably early on by both Mattila (1974) and Parsons (1973). It is even not possible to discount this problem in the case of school leavers, for many go

straight into employment. Presumably in school search would be treated analogously to that on the job.⁽²⁶⁾ When on the job search is allowed the individual is confronted with three alternative strategies:

(i) Full-time employment

(ii) Search on the job

(iii) Full-time search

The choice of which option to pursue can be seen as that of determining the optimal quitting policy. Burdett (1978) presents a model of this process which is capable of generating the "right" cyclical prediction on quits. It is, in fact, optimal for a worker to quit if, and only if, the discounted earnings of the current employment are less than his discounted reservation wage for ever less any out of pocket expenses of quitting (for example, loss of pension and/or seniority rights).⁽²⁷⁾ It is to be noted, however, that generally such models assume that search is costlier on , rather than off, the job. This may, or may not, always be true but it certainly might be the case that employment per se might sufficiently enhance external job opportunities to offset this.

In summary, search theory provides many interesting insights into the workings of the labour market, but the initial hopes rested in it have still to be met. To quote Lippman and McCall (1976b) once again:

"A unified theory of search would explain job search behaviour over the life cycle. An individual would be traced from his career choice decision until he withdrew from the labour market either permanently (disability or retirement) or temporarily because of a favourable opportunity to consume leisure or a more rewarding household task. During periods of labour force participation,

the individual's quit and lay-off behaviour and his pattern of unemployment would also be explained no such unified theory exists. Instead, there is a patchwork of models addressing each of these problems in isolation."
 (pp.347-348)

In essence, search theory treats unemployment as just another occupation, and the role of state subsidies in increasing the benefits of being in that state and reducing the cost of search is central. Indeed it has assumed such prime importance, particularly in empirical studies of search hypotheses that, whilst it may not strictly be a theory of unemployment, the issue of benefit inducements is here afforded a section of its own. However, first a line of analysis which developed in the light of some of the deficiencies in search theory, but which also often centres on the role of unemployment benefits, will be considered.

III.ii CONTRACT THEORY

Just as one might (over simplistically) paraphrase search theory as being best applied to determining optimal worker behaviour once unemployed (or optimal firm behaviour once a vacancy arises), one might paraphrase contract theory as saying something about the joint welfare maximising agreement that individual firms and their employees should conclude. Therefore, just as search theory has obvious weaknesses when applied to employment behaviour, contract theory has deficiencies when used to attempt to understand the behaviour of unemployment. Nevertheless, the unemployment implications of the latter are amongst those most strongly emphasised. As might be anticipated the two are best seen as potentially complementary inputs to whatever "micro-foundation"

eventually emerges, rather than as competitive self-standing theoretical frameworks.

Although here, as elsewhere, centre stage will be occupied by the income smoothing implicit contract theory of the BAG (Bailey (1974), Azariadis (1975), Gordon (1974)) mould, it is to be stressed that this does not represent a complete, or wholly adequate, rationalisation of why employment contracts, explicit or implicit, come into being. In particular, note should be made of the work of Williamson and colleagues (Williamson (1975), Williamson, Wachter and Harris (1975), Williamson (1979)). Working in the tradition of Coase's (1937) seminal contribution, they argue that the existence of transactions costs explains the formation of explicit employment contracts. The basic idea is that there are certain costs of using the price mechanism which can be reduced by internalising them within the firm. These costs include those of discovering relevant prices, which has distinct search theoretic undertones, and those of negotiating separate contracts for each and every transaction. Coase himself realised that his reasoning was of particular relevance for labour when he stated that

"A firm is likely therefore to emerge in those cases where a very short term contract would be unsatisfactory. It is obviously of more importance in the case of services - labour - than it is in the case of the buying of commodities."

(p.392)

To undertake a full review of ^{the} Williamson et al.'s contribution would be to stray too far from the current purpose. The principal conclusion drawn is that the dominant feasible form of employment contract is incomplete and recurrent. Among the alternative contractual forms considered, but rejected, are those through the

spot market, because of transactions costs, and state contingent contracts, because of bounded rationality.⁽²⁸⁾ It is to be noted that differential risk attitudes play no part whatever in their reasoning.

This is a useful line of research, which has been taken up and extended by Okun (1981). However, certain issues should be noted regarding the analysis. The first of these is that transactions costs are exceedingly difficult to quantify and "have a bad name as a theoretical device" (Fischer (1977), p.322). Secondly, it is nowhere suggested that such explicit contracts implying, as they do, short to medium term employment rigidly will be offered to all employees. This is an important point which will be considered when the question of why employment contracts of any sort should stick.⁽²⁹⁾ But, perhaps most importantly, this line of analysis does not provide a convincing rationale for the existence of rigid wages. Given that this was one of the fundamental problems that macro-economics, and indeed labour economics, had to face this is where the literature on the provisions of implicit contracts complements that outlined above.

Sticky wages were not, however, the only motivating force behind the development of the implicit contract theories. Also underlying them was the realisation that most workers are engaged in a relationship with their employer which will be long lasting. Furthermore, the early writers noted that many of the unemployed were on temporary lay-off and would eventually return to their old employer. Feldstein (1976) went furthest along this latter route when he estimated that "at least 75 percent of the workers laid off in manufacturing are subsequently rehired by their original

employer." (p.940). Whilst Hall's (1980) finding that ".....the number of workers who are classified as 'on layoff'actually accounts for only 12 percent of the unemployed" (p.117) seems a generally more acceptable presentation of the facts, he does provide further evidence that this group is one of the fastest to grow as recession sets in.

To help understand these phenomena the early BAG works posited differential risk attitudes between firms and their employers. Azariadis (1975), for instance, cites Knight (1921) in support of this, arguing that "the confident and venturesome 'assume the risk' or 'insure' the doubtful and timid by guaranteeing to the latter a specified income in return for an assignment of the actual results" (Azariadis, p.1185, Knight pp.269-270). Later works, including Azariadis (1981), recognise that this is not in fact crucial; although many see it as a sensible assumption in economies with incompletely developed markets for contingent claims.

The ideas on which the theory are based are essentially quite simple.⁽³⁰⁾ Let there be a large number of identical firms each with a fixed labour pool, L , of homogeneous workers (the assumptions necessary for such a pool to be other than empty will be discussed shortly). Workers are paid according to their marginal products and firms face random fluctuations in the demand for their outputs. For expositional simplicity let this be represented by a product price which takes the values

$(1 - a)$ in state 1

$(1 + a)$ in state 2

where $0 < a < 1$

and the states each occur with probability 0.5. Firms, it is assumed, have a standard production function $f(\cdot)$ and being profit maximisers will be willing, in a spot market, to pay the L workers the value of their marginal products in each state.⁽³¹⁾ That is

$$w_1 = (1 - a) f'(L)$$

$$w_2 = (1 + a) f'(L)$$

Workers will thus face fluctuating incomes with $w_2 > w_1$. Figure 1 depicts the situation with employees assumed to be risk averse.⁽³²⁾

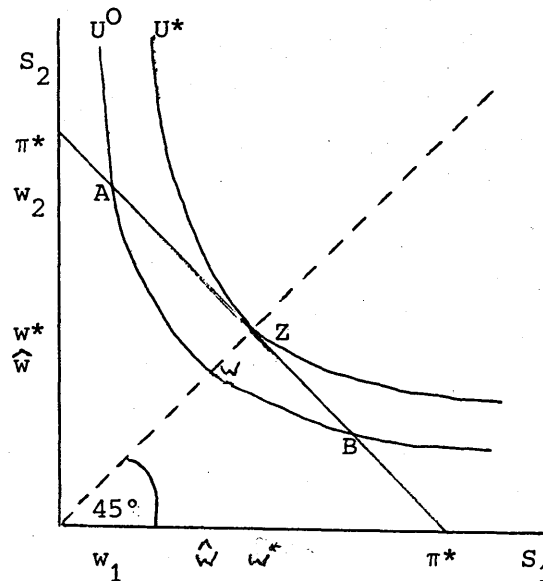


FIGURE 1

Employers, on the other hand, are taken to be risk neutral; that is their utility function is linear in its sole argument, profits.⁽³³⁾

In this situation, there will be a range of wages such as \hat{w} (point w), equal in both states, which workers would prefer to the market clearing wages w_1 and w_2 and which employers would be willing to

pay.⁽³⁴⁾ The line $\pi^* \pi^*$, in fact, represents an iso-profit locus for the firm and employers are indifferent between any points thereon, including the spot market clearing wages w_1 and w_2 .⁽³⁵⁾

Clearly employers will gain if they can force their employees to accept wage combinations inside $\pi^* \pi^*$. In the standard model, this is where the many firms, competitive economy, assumption comes into play.⁽³⁶⁾ Thus unless firms offer a contract which affords the (opportunity) utility obtainable elsewhere it will not attract any workers to its pool in the ex-ante contracting period. Further, the standard competitive pressures will ensure that firms earn only a normal return and the "solution" point will be at Z.⁽³⁷⁾ Here, the situation for workers is that

$$\begin{aligned} w_i &= w^* & i &= 1,2 \\ U(w^*) &= w^* > U^0 \\ w^* &\neq (1 \pm a) f'(L) \end{aligned}$$

At this point, simple contract theory invokes what Akerlof and Miyazaki (1980) regard as its deus ex machina. This is that labour is ex-post immobile. Therefore, the wage w^* will "stick" regardless of conditions external to the firm.

In a straightforward, yet seemingly attractive way therefore, contract theory predicts wage stickiness. In this situation,

"Wages are insensitive to current economic conditions because they are effectively installment payments on the employer's obligation to transfer a certain amount of wealth to the worker over the duration of the employment arrangement..... the current wage is a more or less arbitrary payment on a long-term obligation"

(Hall (1980) p.92)

However, several issues have been overlooked in this simple exposition which must now be addressed.

The first of these is that the model presented above generates real wage rigidity whereas what is generally empirically observed is nominal wage rigidity (Gordon (1982)). This is a serious issue, but Baily (1980), not wholly convincingly, has argued that the theory can handle real or nominal wage rigidity, or the rates of change thereof.⁽³⁸⁾ But, be this as it may, one might like to compare the foregoing with the conclusion to which Keynes' (1936) analysis led him,

"..... I am now of the opinion that the maintenance of a stable general level of money wages is, on a balance of considerations, the most advisable policy for a closed system;"
(ibid p.270)

The above model revealed wage rigidity to be a rational optimising strategy in certain tightly defined circumstances. However, the unemployment predictions of implicit contract theory have probably been the subject of rather more attention. So far the model presented has had state invariant employment. The reason for this is that the value of leisure has been assumed to be zero. Relaxation of the assumption enables the standard "lay-off" result to emerge. This is now undertaken although the current presentation remains simplified and more rigorous proofs can be found in the works cited earlier in note (30).

Thus let k be the monetary equivalent value of leisure and assume that

$$k > (1 - a) f'(L)$$

That is, roughly speaking, the reservation wage exceeds the value of the (full-employment) marginal product in the worst state of the world. This will allow of the possibility of unemployment in that state, although it is not a sufficient condition as the following examination of Figure 2 reveals.

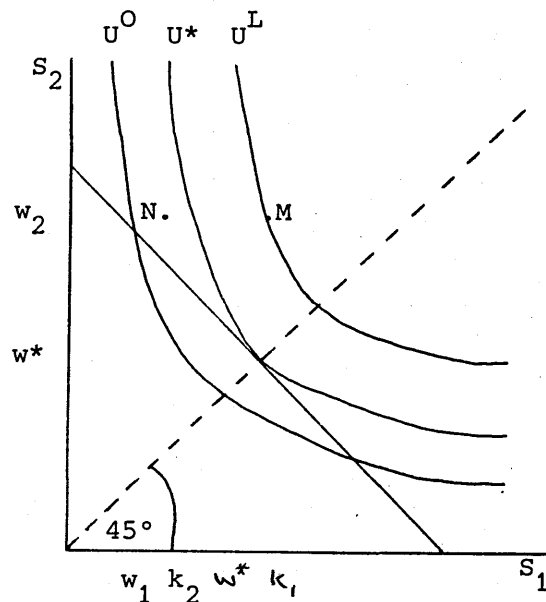


FIGURE 2

There, U^O , U^* , w_1 , w_2 and w^* have the same meaning as they did in Figure 1. If k_1 (point M) represents the value of leisure whilst unemployed then the firm cannot offer any full employment contract C^f such that,

$$U(C^f) \geq 0.5[U(w_2) + U(k_1)]$$

It therefore follows that unemployment will result in state 1. (39)
That employment will be non-zero in this state will be demonstrated presently. But note that if the value of leisure is only k_2 (point N) then the previously optimal fix-wage full employment contract with $w = w^*$ will prevail. Essentially, this is because the worker places value on the income smoothing capacity of the firm.

To enable the firm to produce non-zero output in state 1 in the earlier situation requires that it enhance the terms of the contract which it offers to its workforce until they are at least equal to that provided by

$$0.5[U(w_2) + U(k_1)]^{(40)}$$

Under the assumed production technology this amounts to the requirement that the firm employs fewer than L workers in state 1, thereby raising labour's marginal product and hence the wage payable. Whilst one might loosely consider this equivalent to a pivoting of the opportunity set which the firm offers its workforce the simple diagrammatic constructs above are not able to capture the final solution.

Under reasoning analogous to that invoked above, the wage for those in work in either state will be a constant amount \bar{w} . The solution, and under standard assumptions it exists, will satisfy

$$0.5[U(w_2) + U(k_1)] = 0.5[U(\bar{w}) + (1 - \rho) U(\bar{w}) + (\rho) U(k_1)]$$

and

$$\pi_{\bar{w}, \rho} = \pi^*$$

where ρ is the probability of lay-off ($0 < \rho < 1$) and π^* is the normal rate of profit (including the premium for insurance).⁽⁴¹⁾ Thus when leisure has a value greater than the spot market wage in the worst state, simple contract theory can predict wage rigidity and random lay-offs in that worst state.

But how far does contract theory really take us? Both Baily (1974) and Azariadis (1975) urge caution regarding the macro-economic implications of their constructions and the need for them to be imbedded in a general equilibrium framework.⁽⁴²⁾ However, even as it stands implicit contract theory is open to objection. Perhaps the most fundamental is that concerned with the ex-post immobility of the firm's labour pool.⁽⁴³⁾ Akerlof and Miyazaki (1980) present their "wage bill" argument which indicates that, with ex-post labour immobility and zero value of leisure, no unemployment can occur (as shown above). Indeed, within a limited framework, they also show that unemployment would occur even with ex-post labour mobility only in pathological cases. However, they do not fully come to grips with the problem of an endogenous wage distribution that mobility is likely to create.

Realistically, of course, the value of leisure is not likely to be zero, particularly if "short" periods of unemployment are being considered and if unemployment compensation is available.⁽⁴⁴⁾ When this is the case Akerlof and Miyazaki (1980) state that,

"Now, without recourse to the nexus of implicit contracts, it is already well known that reservation wages and exogenously available unemployment compensation can cause such 'unemployment'. In the neo-classical regime, without contracts, the labour market operates as an ex-post spot labour auction. Such a market will fail to clear if $p(s)f'(\lambda) < v(s)$. Thus, the set of unemployment states so generated in the labour contract regime is a subset of unemployment states of the corresponding neoclassical regime of labour auctions 'In any event, such unemployment is purely voluntary:'"
(ibid p.329)

This is a continuing bone of contention but also one where the contract theorists would appear to have the upper hand. Contracts are entered into ex-ante voluntarily as offering the best

(probabilistic) terms available, any ex-post unemployment is unwanted. To cite Baily (1980)

"One of the strengths of contract theory is that it models job separations in a way that is entirely consistent with the fact that laid off workers would prefer to continue working full-time at the going wage; in other words layoffs are involuntary. Workers are assumed to be aware that their employment situation is risky ... But an enlisted man in the army who gets his head blown off would hardly be described as dying voluntary, just because he knew ahead of time that army life was dangerous."
(ibid p.128)

Seemingly more damaging, however, is the result that in a world of contracts unemployment is always, *cet. par.*, less than in a spot auction world. If this is so then how can it be proposed as an explanation of unemployment of such magnitude as to be the cause of Keynesian social concern? To this, the partial response of the contract theorist is that the contracts themselves are not inviolable. They are, after all, only implicit and will only stick whilst the gains from so doing exceed the losses from non-compliance.⁽⁴⁵⁾ Holmstrom (1981) in fact presents a model which explicitly recognises that involuntary servitude is legally restricted. In particular, workers are portrayed as quitting in the "second period" if their contractual wage falls below that available elsewhere. The upshot is a collapse of the wage rigidity property in the second period, unless firms are to lose all of their workforce.⁽⁴⁶⁾ Indeed, he further points out that contract theory logically neither implies aggregate wage stickiness, up or down. The reason is that the analysis refers only to individual wage contracts. There can be no presumption that new generations of worker will receive the same wage as older ones. Equally, laid-off workers who have to find jobs elsewhere may have to

accept lower wages than previously. However, wage movements should be more sluggish in a contract, than an auction, world because of pre-existing contract provisions.

A further feature of the implicit contract literature is that they are not viewed as universal. Most writers in this field would agree that, in aggregate, the labour market is composed of two sectors, one auction and one primary. It is only the latter market where the propositions would be expected to hold.⁽⁴⁷⁾ The reason for this is that labour contracts, either of the Williamson et al. variety or the implicit kind, require some economic glue to make them stick. One of the beauties of the work of Williamson et. al. (particularly Williamson, Wachter and Harris (1975)) is that they develop their analysis specifically cognizant of the earlier contributions of Becker (1964) and Doeringer and Piore (1971) which specifically model attachments between firms and workers.⁽⁴⁸⁾ To the extent that young workers inhabit the secondary auction sector this line of reasoning would suggest that their market will clear continuously or, at least, that the relative youth to adult unemployment ratio would move cyclically. Whether this is in fact true will be considered in more detail in Chapters 5 and 6. However, this is not the usual presumption, if only because the secondary sector simply fails at times to create sufficient employment opportunities.⁽⁴⁹⁾ But if the secondary labour market fails to clear in slumps whilst the primary sector offers both fixed wages and guaranteed employment, à la Akerlof and Miyazaki (1980), then it might be possible to derive the more usual hypothesis that the youth to adult unemployment ratio will move pro-cyclically.

However, to regard young workers and the secondary labour market as synonymous is undoubtedly to go too far. One might cite, for instance, the institution of apprenticeship as one example of youths not being regarded as a strictly variable factor. This might be taken to be a classic form of "contract" under the terms of which young people are guaranteed an annual wage increment in return for gradually increased productivity which, over time, represents a market return to both parties. Indeed as a mechanism for generating future labour input this highlights how young workers may not in many instances be valued for their present performance. More will be said on this in the following chapter.

Nevertheless, when combined with human capital theoretic considerations etc., it has been noted that efficient contracting dictates

"....layoffs ought to be concentrated among junior workers whose specific capital is smaller and whose costs of finding new work are probably lower."
 (Hall (1980), p.108)⁽⁵⁰⁾

Human capital, therefore, not only provides the cement for contracts but also the "escape" when the heterogeneity of labour is recognised. But note that labour heterogeneity was not an early neglected area for contract theorists. Azariadis (1975), for instance, extended his work to cover it with the principal conclusion that unskilled workers will be laid off before the skilled.⁽⁵¹⁾ But again one can see the importance of human capital theoretic influences and, because of this, in the empirical work which follows reference will sometimes be made to them when the emphasis could equally have been placed on contract theory.

One issue which is generally assumed away, however, in the literature on implicit contracts is that of hours of work. One can imagine that hours of work reductions and work-sharing could invalidate, or at least severely temper, the lay-off implications derived. But some might argue that this is a criticism which is met by Hall's (1980) extended discussion of the contract theoretic approach to the workings of the labour market. Whether it is an explicit or implicit condition of service, he argues that workers simply "work harder when there is more work to do."

So how does contract theory enhance understanding of the operation of the labour market? It seems to make a useful contribution to the analysis of individual contracts struck between firms and their employees.⁽⁵²⁾ It does not, however, generate general equilibrium findings. In particular, it is not shown that the sum of all favourable state employment contracts is equal to total labour supply at the market clearing level of utility. Additionally, it does not show why there is distinctly more work to do at some times rather than others. Whilst many would not agree with Akerlof and Miyazaki's (1980) conclusion that its contribution has been "nugatory", it cannot, so far at least, be claimed to have fulfilled its early promise as a "micro-foundation". Also, for the particular purposes of studies of the present kind which recognise the fact that the labour force is not homogeneous in economically relevant ways, it is only when it is combined with reasoning from other strands of thought, such as human capital, that contract theory yields interesting predictions. Nevertheless, the value of leisure remains crucial to the unemployment predictions of both it and search theory and unemployment benefits are usually seen as an important element of this, and their influence will now be considered further.

III.iii BENEFIT INDUCED UNEMPLOYMENT

As has been seen, the assumption that leisure has value is central to several theories of the labour market. In most Western economies the state provides some form of unemployment insurance to those becoming unemployed in the form of monetary transfer payments. This will increase the utility available to those in this state, and both search and contract theory in general predict that this will increase its magnitude. But the notion of benefit-induced unemployment also has a literature of its own which will be explored here; one justification for which being that the existence of such payments is not logically necessary for either of the foregoing theories to generate non-zero unemployment. Equally, however, it is not strictly necessary for individuals to be engaged in search, or awaiting recall, for the existence of unemployment benefits to generate periods of non-work.

But before considering the situation with exogeneous unemployment compensation, it is instructive to consider the simple, single period choice problem the individual is confronted with in standard textbook expositions.⁽⁵³⁾ There, utility is defined as a function of leisure (L) and income (Y), giving

$$(1) \quad U = U(Y, L)$$

and it is assumed $U_L, U_Y > 0$. This is then maximised subject to the budget

$$(2) \quad Y = (T - L)w$$

where T is total available time and w is wage rate. It is then logically possible with $U_L, U_Y > 0$, that hours of work will voluntarily be set to zero. Only the practice of using simple Lagrangean calculus imposes the "internal solutions only" limitation, not any feature of the economic reasoning employed.⁽⁵⁴⁾ Expanding the tools of analysis to encompass Kuhn-Tucker techniques removes all such restrictions, save that of non-negativity (see Baumol (1972) chapters 3 and 7).

Retaining the foregoing assumptions about the utility function, the possibility of a no work, corner solution is increased if the budget constraint assumes a form more in accord with what one empirically observes. Thus, assume that all workers whilst unemployed receive some amount of benefit, B , from the state if unemployed, and cannot earn less than this if employed. Work income beyond this level is then taxed at rate t to finance the transfer of payments to the unemployed.⁽⁵⁵⁾ This yields the constraint

$$(3) \quad Y = B + w(1 - t)(T - L - L_B(w))$$

where L_B represents the hours of work necessary to earn B , the unemployment benefit level/"income guarantee", and obviously depends on the wage rate. Figure 3 depicts the situation in such a stylised, but not too unlike the prevailing British, system. In it, $ABCD$ is the "full" budget line and AE , the "simple" one. CB , on the other hand, represents essentially what many label the "poverty trap".⁽⁵⁶⁾ But note that, given the properties of the standard utility function, individuals should not be found located along this segment. Only internal solutions along CD and non-participation (voluntary unemployment) at B should be observed. Furthermore, the payment of

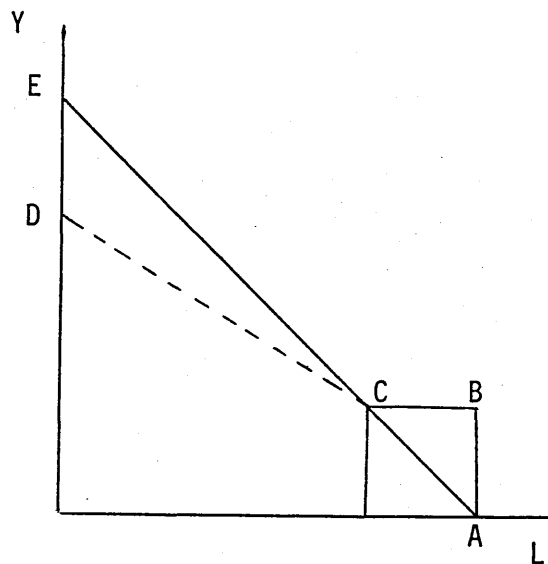


FIGURE 3

benefits whilst unemployed represents a pure income effect and, with consumption and leisure both normal, the probability of voluntary unemployment is increased.

That individuals are observed along segment BC in practice reflects as much the fact that this simple single period construct fails to capture important aspects of true labour markets, even as extended, as it does any unrealism regarding the assumed properties of the utility function.

Of the omissions, that of ignoring the dynamic context of real world decision making is perhaps one of the most serious. With workers possessing less than complete myopia, in many instances they will realise that today's actions may affect tomorrow's

opportunities. In effect, the future budget constraint is not exogenous. Therefore a workers employment status, and returns, in future periods are unlikely to be independent of today's.⁽⁵⁷⁾ This is central to many labour market theories. It is, for instance, at the heart of the human capital theoretic literature inspired by Becker (1964) wherein current investment decisions (which may just be in work experience) are crucial in determining future earnings profiles.⁽⁵⁸⁾ Equally, it can be hypothesised that current spells of unemployment represent adverse signals to employers regarding worker "quality", on a simple extension of the work inspired by Akerlof (1970) and Spence (1974). At a more abstract level, this issue can be seen in terms of the discussion of state dependency which was covered in the section on search theory.

However, very few would deny the tendency towards greater unemployment generated by the existence of unemployment benefits.⁽⁵⁹⁾ But the debate continues to rage as to just how large the effect actually is. In part the answer to this question will depend on the nature of the benefit system in operation. Feldstein (1976) argues strongly that the existence of unemployment compensation has raised the natural rate of unemployment in the United States. His fellow American economists, in general, do not disagree and little emotion seems to be aroused by empirical findings producing support for such arguments.

In Great Britain, however, the situation is significantly different. Several, early, non-rigorous assertions were made as to the significance of benefit induced unemployment of which Wood (1972, 1975) are conspicuous examples. Such an effect, if it exists, can be

said to come about through two possible, non-exclusive, influences. The first is by increasing the propensity of employed workers to voluntarily quit into unemployment.⁽⁶⁰⁾ The second is by lengthening durations of unemployment as unemployed workers are made more "choosy" (their reservation wage rises) by the payment of benefits. This is, of course, the standard search theory result.

However, a large part of the impetus for recent research came from two papers written by American commentators on the importance of voluntary benefit induced unemployment in Great Britain. The first of these was the paper by Maki and Spindler in 1975 on the contemporary situation.⁽⁶¹⁾ At the core of this work was their estimate of the effect on the level of unemployment of the introduction in 1966 of the Earnings Related Supplement to certain unemployment benefit recipients (subsequently abolished in 1981). The magnitude of this on the stock of the male unemployed they claimed was 33% and provoked immediate reaction. One of the principal criticisms levelled was that they simply over-stated the benefits receivable by the majority of the unemployed. In particular, they took the benefits receivable by a specific reference individual (married, spouse present, two children) rather than benefits actually received (see Taylor (1977)).⁽⁶²⁾ When this is corrected for, the impact of the 1966 measure appears to be much reduced (implicitly to around 10% from Nickell (1979b)).⁽⁶³⁾ It is also of interest to note in the current context that both Rice (1984) and Lynch (1983) found rather small effects of unemployment benefits on juvenile unemployment. Furthermore, the latter work found that the level of unemployment income was an insignificant determinant of the reservation wages of unemployed youths.

The second paper to generate a considerable amount of heat was that by Benjamin and Kochin (1979) regarding the impact of unemployment benefits on the level of unemployment in interwar Britain. Indeed this paper must stand out as something of a landmark in that its critics, and the original authors response to them, were awarded an entire supplement to a leading United States journal (Journal of Political Economy 1982) for what was, empirically at least, a purely British issue. Once again the argument swings on whether Benjamin and Kochin actually interpreted the benefit system of the time correctly, or whether they overstated its laxity and misconstrued the benefits available to those actually unemployed. Their critics, Collins (1982), Cross (1982), Metcalf et. al. (1982), Omerod and Worswick (1982) claim this is precisely what they did, and discount their evidence accordingly.⁽⁶⁴⁾ However, to conclude this section on benefit induced unemployment conveying the impression that those who at least question its importance have won the day would be misleading. In particular, mention should be made of the work of Minford and his colleagues, in particular Minford et. al. (1983) and Minford (1983) who consistently argue, and produce evidence to support their stance, that unemployment benefits should be lowered if the British natural rate of unemployment is to be reduced.⁽⁶⁵⁾ These issues will be taken up again in Chapters 5 and 6.

IV. DISEQUILIBRIUM THEORIES

The foregoing presented what have been the major advances in the economics of the labour market with special reference to

rationalising the phenomenon of unemployment. All of them were equilibrium theories in the sense that individuals were portrayed as voluntary becoming, or remaining, unemployed as the best possible alternative given the constraints they face.⁽⁶⁶⁾ At the same time, however, there has grown up a more general literature on non-clearing markets of all forms. The seminal contributions to this research were the works of Leijonhufvud (1968), Clower (1969) and Barro and Grossman (1971). In this work individuals are viewed as being forced off their notional (or desired) supply or demand functions. More recently this form of disequilibrium analysis has been applied specifically to the problem of Keynesian involuntary unemployment. A brief consideration of how this has been attempted forms the last element of this literature review.

It should perhaps, however, be noted at the outset that the principal theoretical contributions of this work have been in developing methods of estimation for non-clearing markets, rather than in enhancing economic understanding of why such situations arise in the first place.⁽⁶⁷⁾ This said, the simplest approach is to propose stochastic labour demand and supply functions

$$(1) \quad L_t^d = \beta^d X_t + u_t$$

$$(2) \quad L_t^s = \beta^s Z_t + v_t$$

where L_t^d and L_t^s represent demand and supply functions at time t , X_t and Z_t the vectors of independent variables determining demand and supply respectively, β^d and β^s their respective coefficient vectors and u_t and v_t are random errors. Then employment is given by

$$(3) \quad L_t = \min(L_t^d, L_t^s)$$

and, implicitly, unemployment by

$$(4) \quad U_t = L_t^s - L_t^d \quad (68)$$

However, such a model as it stands carries with it the fundamentally unrealistic assumption that unemployment and vacancies cannot occur simultaneously; under the assumption that there exists a single labour market. This can be seen from

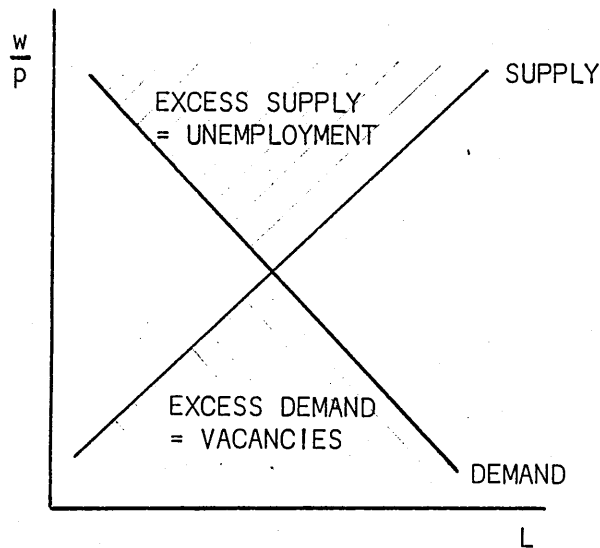


FIGURE 4

Figure 4 which illustrates the above argument in the simple price-quantity space. Clearly this is undesirable. An escape from this problem has been suggested by Muellbauer (1978), working in the tradition of Lipsey's (1960) sectoral disaggregation rationale for the aggregate Phillips (1958) curve relation. Even in this situation, however, each "true" micro market will have either

unemployment or vacancies (or clear), but not both. Search theory, on the other hand, avoids even this complication by assuming that each atomistic buyer and seller walks around in a fog of imperfect information.

At the statistical level problems arise precisely because the need for such a model emanates from the belief that the labour market is very far from being a Walrasian auction market. To estimate the structural functions in a disequilibrium market requires that each observation be allocated to either the excess supply regime, when only the demand curve can be identified, or to the excess demand regime, when only the supply curve can be identified.⁽⁶⁹⁾ However, with wages assumed rigid, and unresponsive to disequilibrium, this effectively debars the use of the Fair and Jaffee (1972) "objective" direction of price movements criterion for establishing whether a demand or supply constrained regime exists at any moment of time.⁽⁷⁰⁾

One possible alternative is to follow Merrilees and Wilson (1979) and employ "professional judgement" as the a priori technique for classifying differing labour market epochs. It must, however, be stated that they did subject their model to standard "structural break" tests. This analysis leads them to conclude that the post-war juvenile labour market was supply constrained in the case of males until 1969 and until 1971 for females, and demand constrained thereafter.⁽⁷¹⁾ It should further be noted that the methodology they adopt explicitly leads to the recognition that one or other of the functions may eventually have to be estimated using relatively few observations, even if the total sample size is satisfactory.⁽⁷²⁾ In

their particular case they present demand functions estimated from ten and eight observations for males and females respectively, which should promote caution when examining this aspect of their model.⁽⁷³⁾

Finally, their work can be taken to illustrate rather well the conceptual problem, highlighted earlier, with this simple approach. That is, if Merrilees and Wilson had actually followed through the unemployment implications of their model then they would only predict non-zero levels of youth unemployment in the 1970's. Whilst it may not be viewed as having been severe before this time, this is clearly unsatisfactory.

The latest generation of models, in attempting to overcome this difficulty, either adopt the Muellbauer (1978) approach outlined earlier or introduce the existence of voluntary unemployment as discussed in the previous section. The former approach is taken by Broadberry (1983) in his contribution to the debate on unemployment in inter-war Britain, whilst the second methodology is adopted by Rice (1984) in her analysis of youth unemployment. This latter

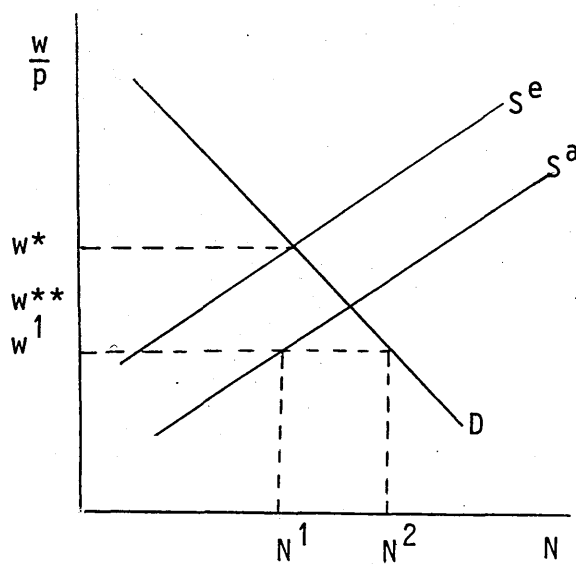


FIGURE 5

approach incorporates Maki and Spindler's (1975) distinction between "apparent" and "effective" supply and it is then clear that, with rigid wage disequilibrium, unemployment can still exist, even with excess demand, albeit voluntary in nature. Figure 5 can be taken to illustrate this point. Thus, even if the real wage lies below its market clearing level of w^* , say at w^1 , there will be observed, or measured, unemployment of $N^2 - N^1$ due to some workers supplying themselves to the market but being unwilling to accept employment at w^1 .⁽⁷⁴⁾ The precise distance between S^a and S^e , the apparent and effective supply functions, is an empirical matter, being influenced by the value of leisure and unemployment benefits and the institutional arrangements under which the latter are payable.⁽⁷⁵⁾

But note should be made of the objections raised in certain quarters regarding what is considered to be an inappropriate use of terminology in such models as those outlined above. Thus, it is felt in some quarters that "true" disequilibrium economics follows the spirit of Leijonhufvud (1968) and attempts to model processes rather than states

"Unfortunately, however, the recent literature on disequilibrium has concentrated mainly on the aspects of disequilibrium amenable to the 'equilibrium method', in particular the min-condition"
(Spanos (1981))⁽⁷⁶⁾

Similarly, Malinvaud's (1977) appraisal of disequilibrium macro-theory of the type purveyed by Barro and Grossman (1971) seems equally relevant in the current context. That is,

"In most cases the analysis is not 'dynamic' in the sense that it would consider a process of adjustment; it is in fact plain equilibrium analysis, but operating with a specific concept of equilibrium."
(Malinvaud (1977) p.5-6)

Thus, Spanos (1981) suggests that a more appropriate name for such analysis might be "temporary equilibrium with quantity rationing".

But whatever one's views on the general merit of the disequilibrium school one must surely question what contribution it has to make, in isolation at least, to explanations of the distribution of unemployment. Furthermore, what is the validity in studying one sub-market in isolation from all others in this framework, as is the case in the earlier cited works on disequilibrium in the youth labour market? But finally, whilst downward wage rigidity might be rationalised if the later post-war period is to be accepted as an excess supply epoch for young workers, "Perhaps the most important task is to explain why the wages of young labour were not allowed to rise in period 1 to remove the postulated excess demand." (Hart (1984) p.6).

V. CONCLUSION

This chapter has reviewed recent attempts to provide an acceptable micro theoretic foundation for the phenomenon of unemployment. Each has clear merits but also transparent deficiencies. For present purposes, however, it is important to note that none can stand alone as a plausible explanation of joblessness amongst young people. But each does have a contribution to make, particularly if combined with human capital theoretic considerations. They will therefore condition much of what follows, along with other influences to be introduced as the work proceeds.

- (1) This has many of the hall marks of later writings on structural unemployment. This issue is taken further in Chapter 4.
- (2) Detailed references to the early 20th Century British work on unemployment can be found in Casson (1979), Chapter 2. For an early American work surveying developments there in an international comparative context see Douglas and Director (1931)
- (3) Kahn's preferred definition is:
"....There is involuntary unemployment to the extent that, at the current money-wage and with the current price-level, the men desiring to work exceeds the number of men for whose labour there is demand." (p.21)
- (4) Although see Patinkin (1965) on the possible complications caused by price expectations.
- (5) The Marshallian assumption is that quantities adjust slowly and prices very quickly (in the limit instantaneously).
- (6) The level of output, whether it is "capacity" or some other level, is, of course crucial to the level of employment in both models. In essence both models are confronted with the same production function constraint.
- (7) As indicated by Stigler, search theory is helpful in all market analyses where there is price dispersion. However, labour markets are usually felt to have "special" characteristics. In recognition of this separate, but not isolated, research traditions have developed in consumer and labour markets.
- (8) Non-sequential strategies, such as those in Stigler (1961, 1962), are sub-optimal compared to sequential ones. See Alchian (1970).
- (9) Even simpler models assume no discounting.
- (10) Sight should not be lost, however, of Rothschild's (1973) objection to this. This is that an exogenous wage distribution needs rationalising, for it is not clear what prevents it collapsing to the single monopsony wage.
- (11) For a detailed treatment of the mathematical properties of search models see Lippman and McCall (1976a)
- (12) That is, he is risk neutral.
- (13) It is to be noted, however, that the reservation wage is lower than in the even simpler case where there is an infinite horizon but no discounting.

- (14) This issue re-emerges in Chapter 4 when the employment distributions of younger and older workers are contrasted.
- (15) At the empirical level there is also likely to be a problem with asking youngsters, or anyone else, what wage offers they would reject, as in these studies, rather than, say, observing those which they actually turn down.
- (16) Analyses in this vein for youths in the USA can be found in Corcoran (1982), Ellwood (1982) and Heckman and Borjas (1980).
- (17) One might prefer to look on this as the result of a wage distribution which shifts adversely as unemployment lengthens, perhaps through skill loss and a (relatively) sticky reservation wage. In the case of young people it may be that the work ethic, or discipline, is perceived as the "skill" eroded.
- (18) For relatively early formulations of this see Barron (1975) and Feinberg (1977).
- (19) In fact they argue that using the simple, static search theory to rationalise the (dynamic) Phillips curve is inappropriate. Also it is non-sensical to criticise such models for not predicting quits and layoffs correctly as they do not know what they are.
- (20) Once again the contract theories of Azariadis (1975) and Baily (1974) are helpful on this point.
- (21) Lippman and McCall (1976a) outline circumstances in which the reservation wage properly may not even hold at all.
- (22) This in fact is probably too strong. Even if job advertisements do not contain pay details (and many would appear not to) the act of application normally serves to elicit information on the potential wage offer. That is, there is often a wage for the job rather than the specific worker, as discussed in job competition models.
- (23) Lippman and McCall (1976a) call these bankruptcy models.
- (24) On the assumption that wealth increases with age.
- (25) Note also the possibility of other family members increasing the amount of paid work they perform to compensate for the income loss of the unemployed searcher. Nominal family wealth, at least, need therefore not necessarily fall.

- (26) Although school attendance below the minimum legal leaving age could not be regarded as voluntary in the sense that employment is.
- (27) The informational requirements for this are, of course, large. Relative over valuation of external opportunities may contribute to an explanation of the higher quit propensity of young workers.
- (28) Bounded rationality is a term that Simon (1957) uses to describe the fact that:

"the capability of the human mind for formulating and solving complex problems is very small compared with the size of problems whose solution is required for objectively rational behaviour in the real world."
(p.198).

- (29) One problem, for the employer, is that of potential "featherbedding" once the contract has been signed (Okun (1981)).
- (30) Rigorous models can be found in BAG, Feldstein (1976), Azariadis (1981).
- (31) A "standard" production function is strictly concave and with capital held constant, as here,

$$f'(L) > 0$$

$$f''(L) < 0$$

- (32) That is the utility function, defined on income, is strictly convex and

$$U((1 - \lambda)w_1 + \lambda w_2) > (1 - \lambda)U(w_1) + \lambda U(w_2)$$

where

$$0 < \lambda < 1$$

See for instance, Luce and Raiffa (1957).

- (33) That is, they will maximise expected monetary returns.
- (34) Equality across states is not, of course, necessary. All points inside the arc AB are preferred (and feasible) to w_1 and w_2 . There, on the implicit assumption that all wages are currently consumed, income variance is less.
- (35) This is not strictly correct in that, as will all insurers, the employer will require payment for this particular service provided. The simplification does no real damage, however.

- (36) If this assumption were not made than one is, in certain circumstances, faced with a classic collective bargaining problem.
- (37) That the solution will lie on the 45° bisector is a consequence of the results of Borch (1962) and Arrow (1971). Efficiency requires that the marginal rates of substitution between consumption in any two states be equal for both parties. With risk neutral employees this boils down to the requirement that $U'(w_2) = U'(w_1)$. That is wage equality across states with state invariant preferences.
- (38) See also the discussion by Okun (1981) on wage - wage rigidity, which further highlights the similarity of prediction from contract theories and institutionalist theories of wage setting behaviour.
- (39) k_2 need not be greater than w^* as casual inspection will confirm.
- (40) That the firm actually wishes to produce a non-zero output in this state requires the imposition of a boundary condition such as $f'(0) = \infty$. See Akerlof and Miyazaki (1980).
- (41) ρ is constant across workers due to the homogeneity postulate. More realistic lay off rules will be discussed below.
- (42) Baily (1982) highlights the problems of developing contract theoretic analysis when he points to information complexity, difficulties in co-ordinating wage levels and lack of competition in the labour market as features underlying implicit contracts. Furthermore, Baily (1983) finds that firms were unwilling or unable to act risk-neutrally in the American depression of 1929-1941.
- (43) Empirically the problem is that contracts are enforceable on firms but not on workers.
- (44) The role of unemployment compensation in generating unemployment is considered separately below.
- (45) A strictly neo-classical analysis would reach the same conclusion regarding explicit contracts also.
- (46) This problem is reduced once movement costs are allowed for.
- (47) The terminology adopted is that of Doeringer and Piore (1971). Other terminologies for the primary market include "career" (Okun (1981)) and "idiosyncratic task" (Williamson et. al., cited above).

- (48) Over and above human capital and internal labour market considerations firms, and workers, may still require Okun's (1981) "reputation".
- (49) It is tempting to argue that they fail to "materialise" because they offer wages below the value of leisure, although this is not altogether in the spirit of secondary labour market analysis.
- (50) Among other papers concerned with efficiency in contracting are Feldstein (1976), Baily (1977) and Hall and Lilien (1979). An efficient contract has the property that no other level of employment would make both firms and workers better off. That is, they should be on the contract curve.
- (51) Note that one might posit differential lay-off by seniority, but for Oi (1962) service length would again be a proxy for human capital investments. For Grossman (1977, 1978) it represents the more abstract, but none the less productive, trait of reliability. On this see also Markusen (1979).
- (52) This relates to Hall's (1980) micro-efficiency condition whereby the marginal product of labour is equated to the marginal value of time.
- (53) In the USA, unemployment benefit is to a certain extent endogenous with firms being "experience rated" (see Feldstein (1976)). Note also the analysis of Akerlof and Miyazaki (1980).
- (54) All that is required for a no work outcome is that $U_L/U_Y > w$ at $T = T_{max}$. This is perfectly feasible even though $U_L, U_Y > 0$ and the assumption of strict convexity is adhered to.
- (55) Relaxing this extreme simplification gets one into the murky area of the value imputed to publically financed goods and services that the income taxation begets. Of course, such problems are not absent even in the simple case portrayed.
- (56) Even if it is argued that the horizontal segment BC misrepresents the situation for young people, it is still true that, as the problem is constructed, they should not be found on AC if they can locate at B.
- (57) Of relevance here is the work of Ellwood (1982) who finds evidence of persistent (negative) wage rate effects of early unemployment spells and that of Meyer and Wise (1982) who find that work experience whilst in school positively effects both future hourly wage rates and annual weeks of work. The combined effect of the two outcomes in this latter research produce a significant impact on future earnings.
- (58) In particular one might note the (relatively) low wages paid to trainees such as apprentices.

- (59) Indeed search theorists would, in general, argue that some level of benefits is efficient in that it prevents untimely job snatching and consequent maldistribution of labour across employments. Under contract theories, exogenously financed unemployment benefit will tend to increase unemployment, but this is not necessarily efficient as a wedge is driven between the private and social valuations of employment (see Hall (1980)).
- (60) Unemployment benefits might also increase the propensity of employers to enforce involuntary separations as they believe workers will be less "harmd" by the unemployment that ensues. This is central to the contract theories discussed above.
- (61) Note also their sequel paper of 1979.
- (62) For a further discussion on actual unemployment benefits and their value to the unemployed see Piachaud (1981)
- (63) On Maki and Spindler see also Junankar (1981), Sawyer (1979) and Cubbin and Foley (1977).
- (64) Of other contributions to this debate see also Broadberry (1983) and Hatton (1979, 1981).
- (65) On Minford et al. see the critique by Nickell (1984).
- (66) In the case of contract theories this is in an ex-ante sense.
- (67) Equally, there appears to have been little said on why regimes switch.
- (68) Rice (1984) estimates a refined version of this form of model simultaneously, with endogenous switching points, by means of maximum likelihood.
- (69) There may, of course, be multiple regimes of both kinds. The classic reference on the issue of identification is Working (1927).
- (70) Wage rigidity and consequent infrequency of switching between regimes makes it difficult to endogenise the regime switching points in a model incorporating a wage clearing equation. Rosen and Quandt's (1978) contribution seems to run into the problems this creates as it classifies the 1930's as an era of excess demand.
- (71) Using somewhat more sophisticated techniques, Rice (1984) concluded that the mid 1960's was also, in fact, a demand constrained regime for young females.

- (72) The same is, of course, true of techniques endogenising the switching points, but the technique itself may be thought to obscure this somewhat.
- (73) The precise way they do this in the results reported is to estimate employment functions (relative to adults) for the whole of their data period with the demand variables suppressed in the early, excess demand epoch.
- (74) There is, of course, a problem here in defining w^* rather than w^{**} as market clearing. But the latter represents a, cet. par., unobtainable situation and is therefore, presumably, irrelevant.
- (75) There has, presumably, to be some justification of why people take the trouble to register. With zero unemployment benefits this is problematic.
- (76) Spanos accords credit for the min-condition to earlier works than Fair and Jaffee (1972). In particular he cites Clower (1969), and finds strong evidence of its formulation in Frisch (1949).

CHAPTER 3

THE RELATIVE PAY OF
YOUNG PEOPLE 1950-1982

I. INTRODUCTION

The theoretical developments discussed in the previous section, and labour economics in general, place a central focus on the wage of labour; although it was brought out that notions of the labour market clearing if and only if wages are flexible have recently been challenged by those who argue that current levels, and changes, of wages may tell us very little about the true underlying relationship between labour demand and supply. In principle the concept of the wage being the payment receivable for the supply of a unit of labour service is straightforward, although its empirical measurement is a particularly hazardous exercise. However, given the importance which has often been attached to the pay of young workers in the discussion of their current plight in the labour market, reflected in such prime-ministerial statements as:

"Because the wages of young people are often too high in relation to those of experienced adults, employers cannot afford to take them on".

(Thatcher, Hansard 27th July, 1981, quoted in Rice (1984))

and in the terms of reference of the Department of Employment's 1984 "Put Jobs First" initiative, the details of which were outlined in the Sunday Times 14th October, 1984, it is difficult to undertake a detailed study of the youth unemployment problem without attempting an examination of the behaviour of their apparent rewards when in work.

In pursuit of this objective, this chapter will focus on the time series movements of the relative earnings of young people. Clearly this measure does not necessarily correspond well with the requirements of theory, but it is the one which is the most accessible and which, in consequence, receives the most attention in debate. The outline plan of the work is as follows. In the following section the

principal sources of regular wage data are considered and the case made for focusing primarily on the October Earnings and Hours Inquiry. This does not, however, amount to a claim that it is optimal and Section III highlights the caveats to be borne in mind throughout the rest of the work. Following this, the actual data on the derived wage relativities are presented for the years from 1950 to 1982; a terminal date corresponding to that dictated by the data in later time-series unemployment analysis. This done, Section V goes on to discuss the most popular of the reasons put forward to explain the recent perceived increase in relative youth earnings, after which Section VI develops and tests certain more general time-series models of the determinants of this measure. Finally, Section VII concludes the chapter.

II. WAGE DATA

Three basic data sources present themselves as possible candidates for a study of the relative wages of young people. The first of these is the comprehensive Time Rates of Wages and Hours of Work series which has been collected since 1948 and contains information on the rates payable under certain collective agreements for both youths and adults. However, as Addison (1976) demonstrates in detail, there are many intractable problems attached to attempting to construct national wage rate series from this highly disaggregated source.

The second possibility is to use the New Earnings Survey (NES). However, this did not become annual until 1970 and, furthermore, certain changes in definitional and presentational detail were instituted in 1974 which effectively truncate certain of the

series available. Thus this data cannot yet be said to constitute a satisfactory time series, either for the stand alone purposes of this chapter or for the later work on unemployment. However, it is an important source of supplementary information and the behaviour of relative earnings movements based on it are presented in Appendix Figures A1-A4. Additionally, some further limited comment is also given at the end of Section IV.

This then leaves the Department of Employment's (DE) Earnings and Hours Inquiry. Instituted in 1948, the survey was originally conducted bi-annually in April and October. This practice ceased, however, in 1970 when the earlier enumeration was dropped with the inception of the NES. A marriage of data from the two sources would allow a hybrid continuation of the full series. However, as Murton (1979) graphically illustrates, the correspondence between the NES April data and the October figures is not satisfactory, particularly for youths.⁽¹⁾ For this reason the union will not be made, and attention will be focussed on the October Inquiry figures, as has so often been the case in other earnings studies.⁽²⁾ The five available disaggregations of this data upon which attention will be focussed, both here and in the later work on time series unemployment, are those for full-time males aged 21 years and over, full-time women aged 18 and over, boys 20 years and younger, girls less than 18 and part-time female workers over 18.⁽³⁾ At this point it is perhaps worth digressing to indicate why importance is attached to the earnings of this latter group. One reason is the available evidence that part-time females occupy the lowest rungs of the occupational hierarchy (see for instance Robinson and Wallace (1984)) where one

also expects to find many young people just starting their labour market careers.⁽⁴⁾ On top of this, however, there has been a tremendous growth in part-time working in the post-war period, as Table 1 indicates. Whilst the data sources for the two years are not absolutely compatible, there can be no dispute over the message they convey.⁽⁵⁾ In the 1980's we are now in a position where approximately 1 in 6 of all workers in employment are classified as part-time, and more than 2 in 5 females in work have this status.⁽⁶⁾ Clearly then, the relative wages of part-time workers, especially females, could be of considerable significance in assessing changes in the post-war labour market.

TABLE 1 PART-TIME EMPLOYMENT 1951-1981

	1951	1981
Total Part-time	830,976	4,468,000
Part-time as % Total Employees	4.1	17.8
Total Female Part-time	784,412	3,759,000
Female Part-time as % Female Employees	12.0	41.7

SOURCES: 1951 CENSUS OF POPULATION

1981 CENSUS OF EMPLOYMENT

Returning to the main theme of this section, having elected to emphasise the October Inquiry it has to be borne in mind that even this series is not without its problems as far as the analyst is concerned, a fact which is often overlooked, and the next section aims to make these caveats explicit.

III. CAVEATS

Earnings, or wage, analysis always presents considerable problems and the most important of these, in the context of the data to be examined, are detailed here so as to constitute a unified body of caveats to be borne in mind in later work, where they will largely remain implicit. However, whilst some of these may seem severe, they are meant to signal caution rather than outright rejection of the data. To avoid overly cumbersome grammar these will be provided in the form of a check-list.

(1) The demand and supply of labour respond to different price variables. The gross "visible" wage will presumably constitute an important element of each, although its relation to either total need neither be fixed nor utterly dominant. Employers will additionally have regard to such employment costs as national insurance contributions, hiring and training amortisation costs and non-wage remuneration.⁽⁷⁾ Thomas (1981, p.31), referring to the literature on the fixed costs of labour utilisation and unemployment, states that "One of the difficulties of attempting to estimate relationships statistically is the lack of appropriate data on many aspects of fixed costs" and there appears to be no satisfactory way round this problem in aggregate British time series work. Workers, on the other hand,

will presumably base their actions on the wage net of tax and national insurance contributions, plus any non-wage benefits attached to particular employments.⁽⁸⁾ When considering "outcomes", as in the case of reduced form unemployment equations, the wage variable is normally attempting to capture both of these effects, and must be treated with caution because of this.

Such problems may be particularly severe when considering earnings relative to those of part-time females. In general, the presumption must be that, at any point in time, the real employment cost relative will almost certainly be understated and the real earnings relative is likely to be misrepresented also. Unfortunately, there can be no guarantee that the three relatives - for nominal earnings, for real employment costs and for net employment benefits - have moved in step through time, which is really what is required if the published data is adequately to serve as the single proxy. In general, it is not easy to speculate on just how and when these relatives will have exhibited differing rates of change but certain, specific possibilities can be proposed. Thus, to the extent that incomes policies serve to artificially compress nominal earnings differentials these may move out of step with employment cost differentials if, for example, fringe benefits are substituted for money pay in the case of the higher paid, who might be assumed to be adults. Again, to the extent that young and part-time workers have earnings which are concentrated around the tax and national insurance contribution thresholds, changes in these latter will serve to move all these differentials out of line. In the same vein one can point to the spate of legislative activity, begun in the 1970's, which aims,

not necessarily with reference to economic theory, to improve the labour market conditions faced by females and part-time workers. In particular, note should be made of the Equal Pay Act (1970), the Social Security Pensions Act (1975), the Sex Discrimination Act (1975) and the Employment Protection Act (1975) as likely causes of divergent movements in the different relative wage measures when females are included as numerator or denominator.

In the first place, both the part-time worker and her employer may not have to pay national insurance contributions in certain circumstances. Additionally, they may not be covered by the bulwark of the employee rights legislation which has been enacted in recent years. As there exist several descriptions of the qualification criteria on both of these scores (for instance, Disney and Szyszczak (1984)) they will be only briefly outlined here.

National insurance contribution payment depends on a lower earnings limit that many part-time workers do not exceed, and this represents one way in which they may be cheaper to employ than full-timers. At the same time, of course, the part-time worker's gross wage more nearly reflects the net pecuniary payment received. Coverage under the employee rights legislation is subject to both an hours of work and a length of service qualification which may once again reduce the employers expected cost of employment. In this case, however, the effect on the employees real earnings is in the opposite direction, under the reasonable assumption that employees value these rights.

By affecting full-time and certain part-time employees differentially the various strands of legislation begun in the 1960's will each distort the real effects of the changes in earnings on which

attention is here focussed. However, whilst most young workers will not be exempt from national insurance contributions, they may well not be covered by the employment legislation.⁽⁹⁾ This follows because, by definition, young workers have short service and have also been found to have high quit rates, a characteristic which compounds the simple age effect.⁽¹⁰⁾

(2) The figures refer to gross earnings and as such incorporate the effects of both wage and hours of work factors which potentially bedevils interpretation.⁽¹¹⁾ Even though here the major focus will be on hourly earnings this problem remains. In particular, looking at average hourly earnings does not net out the effects of overtime premium payments.⁽¹²⁾ The unknown biases this generates will depend upon the comparative rates of the premia across groups, on the comparative number of hours of overtime worked and on the comparative efficiencies of overtime working.⁽¹³⁾ However, this could be dangerous ground. Thus there is now a body of literature which argues that overtime working could be an equilibrium reaction by the firm to the existence of work related non-wage costs of employment (for instance, Ehrenberg (1971)). In essence the employer trades off the ratio of the marginal costs of additional employees to those of additional hours against the ratio of their respective marginal productivities.⁽¹⁴⁾ If the result of so doing demands positive overtime working then it is not clear that such payments should be netted. Furthermore, one might note at this point the ongoing debate over the respective physical productivities of men versus hours; the latest, somewhat cautionary, contribution to which is Leslie (1985).

(3) The figures include data on individuals whose earnings were

affected by absence, which may once again introduce bias.⁽¹⁵⁾

(4) The series only covers the earnings of manual workers whilst the British labour force has progressively become more non-manual. Thus, in 1950, 16% of male and 18% of female manufacturing employees were white-collar, figures which had risen to 29.5% and 33.3% respectively by 1979 (Department of Employment Gazette 1950 and 1979).

(5) The series were subject to definitional change in 1980, the impact of which cannot be assessed. Thus until 1980 the series were strictly age delimited, as indicated previously. However, this was then modified to those employed on adult rates and those not so.

(6) Young people on government sponsored training schemes are excluded from the figures. To the extent that such schemes are an institutional datum this could be seen as biasing the figures for young workers upwards. At the moment, under the YTS, employers have all wage costs reimbursed, and hence essentially are allowed, if they desire, a very extended and heavily subsidised screening period.

(7) The series do not pick up the influence of human capital investment on current wage payments which may be an important omission, perhaps particularly for younger workers. Thus any trend from general to specific training (in the Becker (1964) sense), or vice versa, may be expected to influence recorded wage payments by age, *ceteris paribus*.⁽¹⁶⁾ Similarly, any trend for more training to be undertaken by the state (formal education), rather than the firm, sector may be expected to influence wage payments and relativities. This is, in fact, just a specific instance of the more general point made in (1) above. Put slightly differently, current wages can be expected to reflect not only current productivity but also future

expected productivity within the present firm.

(8) The survey is not exhaustive in two ways. Firstly, it is based on a sample and compliance is voluntary. Secondly, not all industries are covered - at the moment all the manufacturing industries are included along with certain principal non-manufacturing industries. Both of these aspects of the survey design have been subject to change from time to time. Furthermore, small firms, as measured by employees, are under sampled and, to the extent that young workers concentrate in such organisations, this may introduce bias.

IV. WAGE RELATIVES FROM THE OCTOBER INQUIRY

Including the series on the earnings of part-time female workers, a total of ten independent earnings relatives can be constructed over the data period. However, given the focus on young workers only the seven explicitly incorporating them will here be considered. But this is not to be taken as an assumption of separability in the production function, rather as a reflection of the difficulties inherent in analysing indirect cross price movements in a largely descriptive framework. As already stated, the intention is to focus on the hourly earnings relatives. This seems reasonable given that the figures for weekly earnings do not provide any apparent contrast. For completeness, however, both the weekly earnings and hours of work relatives are provided in the appendix, as Figures A5 and A6 respectively. The body of this section first considers the young mens' and then the girls' relatives in outline. This is followed by a discussion of certain, more specific, possible influences on these statistics.

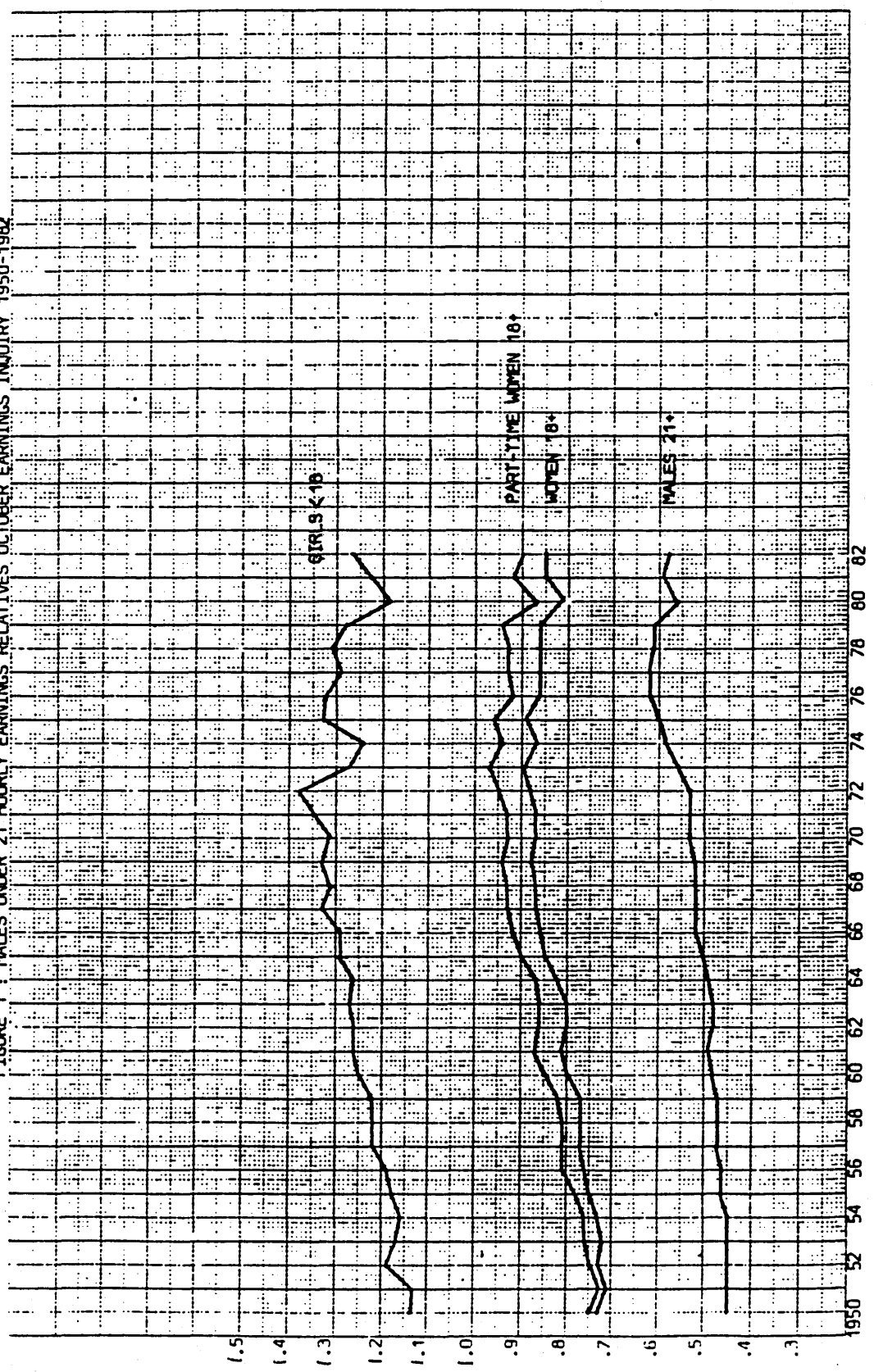
(a) YOUNG MALES

Figure 1 plots the behaviour of the four derivable ratios incorporating young men as the numerator. Looking firstly at that with adult males, a general upwards trend is apparent until 1976. Roughly half of the 37.8% increase in the ratio occurred prior to 1970, with the rest coming about thereafter. Indeed, all of this latter change took place between 1972 and 1976. An examination of why this might have occurred follows below, but it is important to note that, by concentrating solely on this later four year period, previous work may have been overlooking the possibility that the increase in the earlier epoch may harbour important insights into the age-wage issue. But also one should note that since 1976 the trend in the ratio has actually been downwards. Unless other sources provide a contrast to this, the wages of youths do seem recently to have moved in the direction advocated in certain quarters for youth unemployment to fall.⁽¹⁷⁾ However, this raises the question of the requisite degree of flexibility somewhat prematurely.

The ratio of young male earnings to those of adult females has moved in largely the same direction as that to adult males, if somewhat more erratically. Additionally, however, one might note that the early period of increase came to a halt somewhat sooner, in 1967, than was true when boys' earnings were compared to those of adult males. Furthermore, whilst the series did turn up again in the 1970's this trend lasted for only two years, and the level achieved was not sustained.

The third comparison for the average hourly earnings of young males is with those of adult part-time females. Apart from an initial

FIGURE 1 : MALES UNDER 21 HOURLY EARNINGS RELATIVES OCTOBER EARNINGS INQUIRY 1950-1982



dip in 1951, this series also rose more or less steadily except for slight reversals in 1962 and 1970, to reach its peak value in 1973 of 97%. Unfortunately, particularly detailed information on female part-time working is not available for these early years. However, to pre-empt later work slightly, certain casual observations can be made. Thus data was available on the percentage of the work-force in manufacturing comprising part-time females and, from 1956, their earnings in the manufacturing industries are separately identified in the Earnings and Hours Inquiry.⁽¹⁸⁾ From 1956 to 1972, the last year for which a detailed age analysis is available, the boys to part-time females hourly earnings relative in manufacturing at October, rose by 21.9%. Over that period the percentage share of total employment therein accounted for by part-time females rose from 3.9% to 5.1% whilst that of males aged under 20 changed from 5.4% to 5.2%.⁽¹⁹⁾ One would clearly want much stronger evidence that relative earnings movements had caused factor substitution. But when data is in limited supply any information is at least interesting and, as will be shown later, not all of it points in the same direction. Beyond 1973, however, the earnings ratio has shown some tendency, if only slight, to fall, thus mirroring the behaviour of the two previously described for the late 1970's and early 1980's.

Finally, attention is turned to the earnings of male relative to female youths which, somewhat surprisingly, seems to achieve little attention; in spite of the fact that the secular decline of traditional heavy industries might be thought to have increased the direct competition between the two groups for employment. Once again the, by now familiar, pattern emerges for earlier years with the ratio

increasing gradually to its peak value in 1972. After this the series behaved somewhat erratically, but never achieved its previous height. In particular one should note its behaviour since 1980, when it has turned sharply upwards. This may, of course, be due to the definitional changes invoked in that year but, if more substantive, might be expected to improve the employment prospects of girls vis-à-vis those of young males.

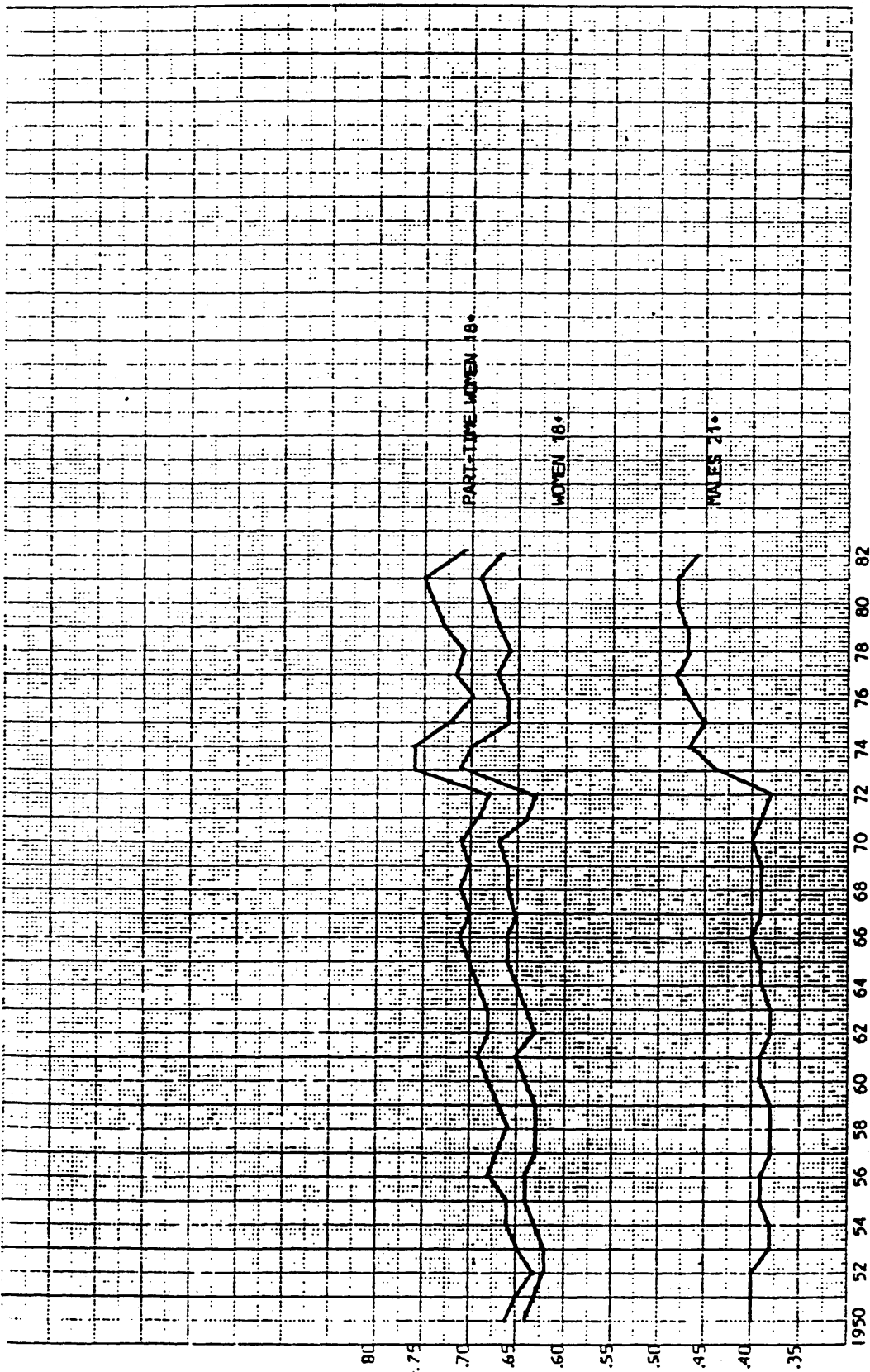
(b) YOUNG FEMALES

Having looked at the young male earnings relatives this leaves three independent ratios involving young females to be examined. The time series behaviour of these is depicted in Figure 2. Up until 1972 that with adult males displayed only slight amplitude. The figure then rose, apart from 1975, until 1977 to a level 18% above its 1950 value, whereabouts it remained until starting to fall in 1981.

Similarly, no clear trend emerges when looking at the relative hourly earnings of young to adult females over the period to 1972, the value of which varied around the 65% mark; although with slightly stronger cycles than was the case against adult males. In 1973 this rose and was largely sustained through 1974. From then on, however, it hovered around lower levels, and by 1982 had fallen to a value of 0.63.

This then leaves just the earnings of girls relative to part-time females to consider. Throughout the period since 1960 this has exhibited frequent short cyclical movements upon which no clear trend has been superimposed. Any increases there have been, such as in 1972-73 and 1978-81, being fairly speedily reversed. But, as in all previous cases, no attempt at rationalisation of change or constancy

FIGURE 2 : GIRLS UNDER 18 HOURLY EARNINGS RELATIVES OCTOBER EARNINGS INQUIRY 1950-1982



has been offered here.

However, it would be wrong to conclude this section without stressing that certain writers have placed considerable emphasis on what they perceive to have been unjustifiably large increases in the relative earnings of young workers in the 1970's. Whilst a certain amount of disagreement may be entertained concerning the significance of the movements in the October series, it is important to note that;

"... this increase in the relative wages of young people is not confirmed by the time series of relative wage earnings taken from the New Earnings Survey ... This is important: ... the New Earnings Survey covers services, distribution and non-manual labour and is much more representative of the earnings of young people. When the time-series of the New Earnings Survey become long enough to use for econometric analysis, these data should be substituted for the October Inquiry data".

(Hart (1984) p.4)

This said, the next section attempts to graft a little substance onto the foregoing stylistic bones by considering the more important of the popularly hypothesised reasons for the increase in the relative earnings of youths which many commentators perceive to have occurred.

V. RELATIVE EARNINGS : POSSIBLE INFLUENCES

As noted at the outset, there has been a considerable amount of interest shown in the behaviour of relative youth wages, which has increased with the passage of time. In general, commentators have focussed upon one or more possible influences from what appears to be a core group of factors; and based discussion upon them in varying degrees of detail. These popular hypotheses will now be examined.

(a) ROSLA (Raising of School Leaving Age)

As has been seen, all the youth - adult earnings relative moved sharply upwards between 1972 and 1973 which coincides with ROSLA

having its impact between Spring and Summer 1973, and being picked up by the October Inquiry of that year.⁽²⁰⁾ What ROSLA served to do was to remove the youngest (15 year old) workers from the labour force. To the extent therefore that earnings are age related, and this will be discussed more fully below, one would expect that this would raise the average earnings of youths of which these 15 year olds were but a part.

That there was some effect on relative earnings is now fairly well agreed, and not surprising. But, considering ROSLA in isolation, what is also not surprising, but does not appear to have received any attention, is that girls' earnings seem to have been increased relatively more than those of boys. That this happened can be seen most clearly from the decrease in their direct earnings relative in Figure 1. Principal amongst the reasons for this will presumably have been; firstly, that 15 year olds will have constituted a smaller proportion of an age band including all less than 21 years (i.e. young males) than of an age band only including those aged 15-17 years (i.e. young females). Secondly, the greater propensity of males to stay at school beyond the statutory minimum school leaving age will have led to a smaller impact of ROSLA on boys' pay, even if the earnings variable had been calculated for similar age bands. But the problem, of course, remains that if the earnings movements simply reflected the age composition effects of ROSLA, and if productivity is directly related to age, then there is not necessarily any reason to view a once over re-alignment of earnings, as a consequence of the legislation, to be the portent of difficulties for youths in the market for jobs. Attention is, therefore, turned to the potential influence of wage controls.

(b) INCOMES POLICIES

Some additional "responsibility" for the increases in relative youth earnings in the 1970's is sometimes attributed to the effect of the incomes, or pay, policies that were effected during that period and which had, in general, as one of their main conditioning characteristics the protection of the low-paid.⁽²¹⁾ The continuing rise of the male youth-adult earnings ratio to 1976, in particular, is an obvious candidate for such reasoning. The incomes policies in question operated continuously from November 1972 to May 1979.⁽²²⁾

The three stages of the Heath government's November 1972 - February 1974 policy imposed maximum annual income increases for individuals of zero, £250 and £350 respectively. Furthermore, Stage III of the policy was initially continued by the new Callaghan administration, elected in the February of the later year. If the policy was effective then there is the presumption that it could have tended to reduce youth-adult money earnings differentials. In July 1974 the Labour government introduced the first Social Contract which, although only calling for "responsible" collective bargaining, had the support of the TUC and was biased towards aiding the low-paid. When this policy expired in 1975 it was followed by Phase 1 of the second Social Contract which allowed earnings increases of only £6 per week and zero for those earning in excess of £8,500 per annum.⁽²³⁾ It may seem reasonable therefore to infer some measure of causality for the continued increase in youth relative earnings to the impact of restrictive pay policies. But the question must be asked whether this necessarily identifies a cause of problems for young workers.

Thus, in the first place, the policies normally set a ceiling to the outcome of pay negotiations, they did not provide for minimum outcomes, or "norms". Further, if labour productivity changed uniformly by age and sex group within each "industry" and if in some £6 represented the equilibrium wage increase for young, lowly-paid workers, then it would fall below that required for older, more highly paid, members of the workforce. Prior reasoning would then lead one to expect "slippage" at those levels of the hierarchy where the policy was apparently binding. This leads directly to the caveat, noted earlier, that the earnings figures being examined refer only to nominal pay. As Pencavel (1981) elaborated, nominal incomes policies should lead to the substitution of non-pecuniary benefits for money-wage increases. There is little formal evidence on this, without which little can be said about its impact on real pay relativities. However, the initial hunch must be that, if this escape mechanism operated it did so in favour of restoring equilibrium differentials.

It must also be noted at this juncture that the youth differential ceased to rise after 1976 in the case of boys and 1977 for girls, in spite of formal incomes policies continuing until the General Election of May 1979.⁽²⁴⁾ An obvious reaction would be to argue that these later constraints failed to bind in an economic sense, but then one must also note that there is some evidence to suggest that policies post 1976 were in fact successful (Henry (1981)), at least in so far as they restrained nominal wage increases.

This short discussion of incomes policies has raised more questions than it has provided answers. One of the main thrusts has

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been that it might be particularly important in times of such initiatives to distinguish between the real and the nominal rewards of labour. Thus, whilst one might claim to have found some evidence that the 1970's income policies affected nominal pay differentials, much more needs to be known about the behaviour of non-pay benefits over this period. But also the earnings ratios involving females - young, old or part-time - do not lead to firm inferences regarding incomes policy. For instance, if anything boys' earnings relative to adult females declined beyond 1973. This suggests that other factors may have been influencing relative pay, and one of the leading contenders as far as females are concerned is now discussed.

(c) EQUAL PAY AND SEX DISCRIMINATION ACTS

In 1970 the Equal Pay Act was passed to be implemented in full by 1975, the latter year being also when the Sex Discrimination Act came into force. The former may be thought of as aiming for equality of treatment in terms of remuneration for men and women engaged in similar work whilst the latter was designed to promote equal access to jobs, and covered areas such as hiring, training and promotion. Both acts, however, should presumably have called into motion forces tending to affect male-female pay relativities - the first directly and the second via employment composition effects. There are many problematic features of these acts (see Joseph (1983) pp. 233-239) which will not be considered here. Rather the principal emphasis is on aggregate relative wage movements, given that the legislation did have some impact, which would appear to be a generally accepted proposition. (25)

Looking at young males one can see that their earnings relative

to adult females peaked in 1973, in spite of the fact that relative to adult males they continued to rise until 1976. Furthermore, the increase in the former over its level in 1950, 23.3%, was somewhat less than that recorded by the latter in its highest years, 37.8%. Similarly, the impact of ROSLA on the girls-women relative appears to have fully worked through in one year. It is not clear why this ratio actually turned down after 1973, given the influences so far discussed. But it may partially be due to young girls disproportionately crowding into very small firms which are not covered by the provisions of the acts.

The casual evidence presented here does then seem to suggest that the pro-female legislation of the 1970's did serve to increase their relative earnings or, in some cases, to maintain their level despite other counterveiling influences.⁽²⁶⁾ Whether the 24% increase in the adult female-male earnings ratio between 1972 and 1977 was a satisfactory outcome is not here the issue; although the possibility that this provoked substitution against females, which might of course contravene the Sex Discrimination Act, will be explored in a little more detail in the following chapter.

Finally, attention may briefly be turned to the behaviour of youths earnings relative to those of part-time females in the 1970's. It has been noted elsewhere of the Equal Pay and Sex Discrimination Acts that:

"Neither Act makes reference to full-time or part-time employment in setting out the criteria for determining claims against discrimination. Until 1981, an employer was able to use section 1 (3) of the Equal Pay Act to resist claims for equal pay brought by a woman in part-time employment, on the grounds that differences in working hours were 'a material difference' (other than the difference of sex) between her case and his".
(Robinson and Wallace (1984) p.5)

How widely this escape clause was used cannot really be known as only official complaints are fully recorded. However, it can be noted that youth earnings relative to this group trended downwards after the impact of ROSLA in 1973. Once again, therefore, it is not too difficult to casually marshal the data in support of yet another argument. This seems a much less easy task, however, in the case of the final, and perhaps most popular, hypothesised cause of the relative increase in youth earnings in recent times.

(d) TRADE UNIONS AND WAGE COUNCILS

Rigid union pay structures (Wells (1983), Rice (1984)) or the dictates of wage councils (Rice (1984)) are perhaps the most popular political and media reasons given for the upwards movements in youth relative earnings in the 1970's; and the sentiments have received a reasonable degree of support in the academic literature, as the foregoing citations indicate. But much of the discussion appears emotive rather than reasoned, and the present intention is to raise just some of the questions which appear to be largely ignored in this debate. Consider first the trade unions. However strong may be ones reservations about certain union actions or practices in no easily conceivable case do these amount to a statement that they are able to set wages unilaterally, and without cost to themselves. One must ask, therefore, what were their motives in the 1970's, if in fact they were then raising youth relativities? Did employers simply acquiesce and reduce employment correspondingly? Do not older/more skilled union members treasure intra-union differentials as they do those between unions? Furthermore, it must be recalled that the strongest opponents of incomes policies - which, it has been argued, might cause nominal

differentials to be eroded - have nearly always been one or more significant sections of the trade union movement. Many would argue that the unions represent a conservative influence in the British labour market, and no reasoned analysis has been presented of why there was a shift in their preferences in the 1970's.

Having raised some doubts about the trade union argument, what is the apparent validity of that relating to the wage councils? A very brief historical recapitulation should serve to issue caution here also. Thus, the councils were but renamed Trade Boards (largely by the Wage Councils Act (1959)) and the first of these had their inception in the Trade Boards Act of 1909. Whilst initially very limited in scope, the Whitley Committee of 1917 recommended an extension of the system, which started almost immediately with the passage of the Trade Boards Act (1918). It is not clear why they should have chosen the 1970's to compress age differentials, unless there were economic reasons for so doing.⁽²⁷⁾ This doubt is intensified when, ostensibly at least, the only change in the legal environment relevant to the councils around that time was the Industrial Relations Act of 1971, which established the principle that the wage councils should move towards the setting up of their own collective bargaining arrangements, where this was possible.⁽²⁸⁾

All of the above represent important considerations when conducting an examination of relative nominal earnings movements. However, at the same time, they represent a series of quasi-institutional shifts which relate only to one specific, and short, period of time. Progress might now best be served therefore by stepping back and considering some more general potential influences

on relative earnings. In doing this, the simplest of models will be presented first and then estimated; following which the assumptions will be enriched and the model estimated anew. Largely because the appropriate data for the latter purpose is officially only available up until 1972, the estimation of the next section will only be based on observations from 1950 until that year. But note also that the multiplicity of similarly dated occurrences in the 1970's which potentially impacted on relative earnings would render a detailed statistical investigation particularly difficult to interpret. However, the simpler model is returned to in Chapter 6 and its performance re-examined when additional observations for the 1970's are included.

VI. MODELS OF RELATIVE EARNINGS DETERMINATION

VI.1 SIMPLIFIED FRAMEWORK

(a) DISCUSSION AND MODEL

At the outset it should be noted that simple economic theorising recognises only a wage-rate which is faced in common by both demanders and suppliers of labour. Enough has already been said to indicate that this is rather a severe abstraction. Furthermore, the present analysis is concerned with earnings, all be they average hourly earnings, rather than a simple wage concept. The first of these issues will receive no further comment, whilst the second will be taken up a little more fully, principally when the simple model now to be presented is extended below.

At its most basic, assume that, in the aggregate, the demand for labour of worker type i , L^d , is a function of the real wage for that

type of labour, w_i , and the volume of output, Q . That is:

$$(1) L_i^d = f(w_i, Q, Z_i^d)$$

where Z_i^d is a vector of other, unspecified, influences affecting the demand for i . Also the supply of workers of type i is assumed to be a function of the wage and a vector of unspecified supply conditions, Z_i^s . Or, symbolically,

$$(2) L_i^s = g(w_i, Z_i^s)$$

On the additional assumption that the market clears, then

$$(3) L_i^d = f(w_i, Q, Z_i^d) = L_i^s = g(w_i, Z_i^s) = k(w_i, Q, Z_i^d, Z_i^s)$$

which implicitly defines

$$(4) w_i = h(L_i, Q, Z_i)$$

where Z_i is some function of Z_i^d and Z_i^s . If the same were true of each labour type, then one could posit a relative wage function

$$(5) w_i = h_i(L_i, Q, Z_i)$$

$$w_j \quad h_j(L_j, Q, Z_j)$$

where the functional subscripts are merely identifying devices.

With the aim of generating an estimating equation, one might then further simplify and hypothesise that;

$$(6) \quad w_i/w_j = \psi(L_i/L_j, Q, Z_{ij})$$

where Z_{ij} is some mix of the unspecified influences in h_i and h_j .

Clearly one would not wish to stress the theoretical probity of the derivation of (6) nor indeed the assumption that markets clear; although with estimation only taking place to 1972 this may seem more acceptable. Nevertheless, the hypotheses that the relative wages of two groups will respond to their relative supplies and that their individual wages might be differentially responsive to the cycle do seem reasonable. The caveat which must be noted, however, is that the simultaneous setting of wages and employment is effectively ignored in such a single equation treatment. But the later analysis of Chapter 6 does investigate this issue to a certain extent.

(b) ESTIMATION

This sub-section aims to investigate the performance of equations attempting to explain the time series behaviour of youth earnings relative to those of adults based on the reasoning presented above. Following directly from (6) the first model to be examined is

$$(7) \quad \frac{w_i^Y}{w_j^A} = \alpha_0 + \alpha_1 \frac{L_i^Y}{L_j^A} + \alpha_2 Q + \alpha_3 t + u$$

Here w_i^Y/w_j^A is the relative hourly earnings of youth group i to

those of adult group j , where the youths are full-time males aged under 21 and full-time females aged under 18 and the adults are full-time males aged 21 and over and full-time females 18 and over. L_i^Y is the number of youth group i in the labour force (employed plus unemployed) and L_j^A is the analogous measure for adult group j .⁽²⁹⁾ Q is an index of GDP (1975 = 100), t is a time trend inserted in an attempt to capture the unspecified influences, Z , in equation (6) and u is the error term which initially is assumed to have the standard properties.

As for prior expectations concerning the coefficients of (7), it is reasonable, and straightforward, to expect α_1 to be negative. It is possible that there might be more disagreement regarding the coefficient on output, α_2 , but most would probably accept a positive prediction. Basically the reasoning behind this expectation is that youths are more likely to be found in competitive labour markets than are adults who, given their greater human capital, might be expected to be covered by some form of implicit contract which insures their wage (but not necessarily their employment, see Chapter 2) against the state of the environment.⁽³⁰⁾ Also, at a more empirical level, one might expect fewer youth than adult workers to benefit from institutionalised overtime arrangements, be more prone to short-time working etc.; all of which may be important when earnings are the variable under consideration. But it has to be admitted that such arguments are less convincing when females, rather than males, are the adult comparator for youths and it would perhaps be best to refrain from prior speculation in this case.

The results of estimating the four possible youth to adult

earnings equations of the general form described by (7), by the method of ordinary least squares, are given in Table 2. The nomenclature adopted is fairly self-evident, and examples should suffice to describe it fully. Thus C is a constant, BTM represents the number of boys relative to men in the labour force, GDP and T are as in (7), BME is the hourly earnings of male youths relative to those of adult men, \bar{R}^2 is the coefficient of determination corrected for degrees of freedom and DW the Durbin-Watson statistic for serial autocorrelation. In all cases the data were annual from 1950 to 1972, yielding 23 observations.

The most striking feature of this table is that, in all cases, the relative supply variable is incorrectly signed - although only significantly so in the boys to men equation. In an equilibrium framework there would appear to be no straightforward way to rationalise a positive relationship between relative supplies and relative price. To achieve this task it would appear that one would need to argue that disequilibrium prevailed more or less continuously in some, or all, labour markets (for instance that the markets for youths were always in a state of excess demand and wages were groping upwards towards equilibrium).⁽³¹⁾ But equally, if one argues that the weight of the statistical evidence indicates no relationship between supply and earnings (3 out of 4 coefficients insignificant) then this either requires an equilibrium argument based on perfectly elastic demand, or a disequilibrium one based on excess supply. Neither seems particularly attractive and, in the latter context, one should note that Rice (1984) and Merrilees and Wilson (1979) found evidence of excess demand for youths in much of the present data period.

TABLE 2
OLS ESTIMATES

	C	RELATIVE SUPPLY VARIABLES					GDP	T	\bar{R}^2	D.W.
		BTM	BTW	GTM	GTW					
BME	0.328 (9.88)	0.018 (2.47)				0.002 (3.16)	-0.0002 (0.12)	0.967	1.239	
BME	0.599 (8.23)		0.015 (1.63)			0.002 (1.35)	0.004 (1.40)	0.959	1.534	
GME	0.230 (4.37)			0.246 (0.85)		0.003 (3.36)	-0.006 (3.40)	0.284	1.642	
GME	0.420 (4.81)				0.413 (1.57)	0.003 (2.26)	-0.005 (1.65)	0.466	1.076	

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The cyclical indicator works very much as expected and achieves high statistical significance in all but the boys to adult women's equation. But, at this stage, there is no evidence as to how the realignments take place - e.g. by wage rate movements or through adjustments in hours of work (assuming all hours are not paid at the same rate) - an issue which will be taken up in more detail in the following sections. Turning to the time trends, the clearest message is that girls earnings were downwards drifting, for extraneous reasons, through the observation period. However, even in their case, this was only statistically significant compared to the earnings of adult males.

Overall, the results generate very good \bar{R}^2 's in the case of the young males equations but fairly poor ones in the case of young females, particularly in a time-series context. The largest worry, however, concerns the values of the DW statistics. With 4 regressors and 23 observations the indeterminate region for this statistic in the test for positive serial correlation, at the 5% probability level, comprises the range 1.05-1.66 and therefore all of the equations in Table 2 are possibly so afflicted. Therefore, in an attempt to overcome this problem, the equations were re-estimated using a first-order autoregressive procedure due to Beach and MacKinnon (1978).⁽³²⁾ The results of this exercise are reported in Table 3.

Looking at the diagnostic statistics first, one can see that the DW statistics are much improved, although they still only support a confident assertion of no positive serial correlation in half of the cases. This, combined with the fact that the estimated autocorrelation parameter (ρ), is significant in only one equation,

TABLE 3
AR1 ESTIMATES

	C	RELATIVE SUPPLY VARIABLES					GDP	T	ρ	R^2	D.W.
		BTM	BTW	GTM	GTW						
BME	0.336 (8.24)	0.015 (2.45)				0.002 (2.43)	0.00005 (0.03)	0.384 (1.84)	0.972	1.645	
BWE	0.588 (6.45)		0.006 (0.74)			0.002 (1.25)	-0.004 (0.93)	0.354 (1.60)	0.948	1.893	
GME	0.232 (4.08)			0.262 (0.82)		0.003 (3.06)	-0.006 (3.10)	0.130 (0.55)	0.797	1.759	
GWE	0.371 (3.46)				0.473 (1.28)	0.004 (2.37)	-0.007 (1.93)	0.495 (2.27)	0.965	1.584	

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suggests that the problems are more complex than a first-order autoregressive procedure allows for. Notwithstanding this the coefficients of determination also show some improvement in three cases, and by a considerable amount in the case of both of those incorporating young females.

But this latter finding may not seem altogether convincing, for on turning to the actual coefficient estimates very little appears to have changed from the case where estimation was by OLS. Thus the coefficient values have not changed markedly and the t-statistics are in general weaker. One might take some solace in the fact that this applies to the relative supply variables, but their perverse sign does not inspire a great deal of confidence in the model. Returning to the discussion of the supply indicators, it may, of course, be that the recorded employed plus unemployed totals do not adequately measure the concept under consideration. But this sort of argument is usually most strongly advanced in the case of (married) females, whilst the biggest culprit is in fact the boys to men equation.⁽³³⁾ Concluding that this particular hypothesised model is unsatisfactory in many respects, attention is turned to a fairly straightforward variant of it.

The brunt of this alternative argument is that the tightness of the labour market for any group may better be proxied by the extent of unemployment within it; that is a more "outcome" orientated approach than that adopted above. If wages move in the requisite direction to re-equilibrate markets then one would expect a function of the general form

$$(8) \quad \frac{w_i^Y}{w_j^A} = f\left(\frac{U_i^Y}{U_j^A}\right)$$

where U_i^Y is the unemployment rate amongst youth group i , U_j^A that amongst adult group j and f is assumed to have a negative first derivative. Such an argument is clearly not without its problems - sticky wage contracts, hidden unemployment and hoarded labour among them - but it has been experimented with in the literature (Merrilees and Wilson (1979)) and it will be examined here. More precisely the model

$$(9) \quad \frac{w_i^Y}{w_j^A} = \beta_0 + \beta_1 \frac{U_i^Y}{U_j^A} + \beta_2 t + u$$

will be estimated for the four relative earnings ratios presently under consideration.

The relative earnings and time-trend measures are as previously defined, but whilst the general form of the relative unemployment term has been discussed above its empirical proxy requires description. As the watersheds for the transition from girl to woman and boy to man were 18 and 21 respectively in the earnings figures, the same criteria were, as far as possible, used in the definition of the unemployment variables. For females this was straightforward as this age criterion was used in the monthly unemployment statistics. Thus, the numbers unemployed at mid-year divided by the number in the labour force of the relevant ages, again at mid-year, formed the

basis of the unemployment rate measure. However, for males the nearest breakdown of the unemployment figures to that used in the earnings data was a divide at 20 years of age (as opposed to 21) in the mid-year analysis and this was deflated by the appropriate labour force statistics from the mid-year survey. Also, this breakdown of the absolute unemployment figures was only available from 1952 onwards, meaning that the observation period in the 3 equations involving males had to be 2 years shorter than has previously been the case.

The results of estimating equation (9) by means of OLS for each of the four earnings relatives currently under consideration are presented in Table 4 below. Looking first at their overall goodness of fit, the immediate impression is that the boys equations work well whilst those involving young females do not. In the case of the former two, the relative unemployment rate variables are both of the correct sign although they achieve significance at only the 10 per cent level, which is not a particularly strong finding. The time trend, however, is very powerful, showing that the earnings of young males were strongly upward trended relative to those of adults in the data period, for reasons which, at present, are extraneous to the model.

In the girls relative earnings equations, the unemployment terms are considerably less strong and in that making the comparison with the earnings of adult males the term is of the wrong sign. Furthermore, the time trend is much less strong in these equations, being significant and positive in only the girls to adult females equation. This lack of power of the individual coefficients provides the explanation for the unsatisfactory \bar{R}^2 's achieved. But in all

TABLE 4

OLS ESTIMATES

	C	BOYS < 20 REL MEN ≥ 20 U	BOYS < 20 REL WOMEN ≥ 18 U	GIRLS < 18 REL MEN ≥ 20 U	GIRLS < 18 REL WOMEN ≥ 18 U	T	R ²	D.W.
BME	0.446 (48.33)	-0.020 (1.86)				0.005 (15.16)	0.96	1.13
BME	0.692 (110.11)		-0.007 (1.80)			0.010 (12.11)	0.96	1.13
GME	0.376 (42.91)			0.008 (1.08)		0.0003 (1.28)	0.01	1.43
GME	0.627 (129.95)				-0.006 (1.19)	0.002 (3.23)	0.39	1.23

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four equations the DW statistics are low, and do not generate confidence in the OLS assumption of non-serially correlated errors. The equations were, therefore, once again re-estimated using the first order autocorrelative technique cited above.

The results of this exercise are presented in Table 5, and the DW statistics do increase sufficiently to exceed the upper end of the uncertainty range with 21 observations and 3 regressors at the 5% level (1.54). Nevertheless, the autocorrelation parameter, ρ , never achieves this level of significance, which suggests that more complex problems exist than the technique allows for. However, the \bar{R}^2 's in all four equations now give the impression of models which fit the data well. But the individual coefficient estimates have changed little from those generated by OLS and what differences occur in the standard errors do not lead to the alteration of previous conclusions. Indeed all of the simple models estimated would appear to be beset by fairly severe problems of multicollinearity, of which good overall fit but individually poorly determined coefficients are usual symptoms. In the light, therefore, of what can at best be regarded as modest support for the simple market hypotheses put forward, some attempt will now be made to enrich the assumptions in search of firmer empirical findings.

VI.ii EXTENDED FRAMEWORK

(a) DISCUSSION AND MODEL

Clearly the foregoing constructions embody the very simplest of reasoning, and in consequence fail to incorporate many of the economic, sociological and institutional characteristics of the

TABLE 5

ARI ESTIMATES

	C	BOYS < 20 REL MEN ≥ 20 U	BOYS < 20 REL WOMEN ≥ 18 U	GIRLS < 18 REL MEN ≥ 20 U	GIRLS < 18 REL WOMEN ≥ 18 U	T	P	\bar{R}^2	D.W.
BME	0.448 (46.30)	-0.020 (1.86)				0.005 (12.33)	0.412 (1.91)	0.97	1.67
BME	0.695 (78.55)		-0.006 (1.31)			0.010 (9.37)	0.427 (2.03)	0.96	1.65
GME	0.375 (40.79)			0.010 (1.33)		0.0003 (0.85)	0.218 (0.85)	0.89	1.59
GWE	0.629 (92.48)				0.004 (0.75)	0.001 (2.01)	0.377 (1.67)	0.94	1.62

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labour market which may impinge upon the determination of relative earnings. This might be justified under the Occam's razor principle, but this is a conclusion that can only be reached after further investigation. A discussion therefore ensues of other possible influences on relative earnings, which will be followed by a statistical examination of their empirical significance. Whilst there are many avenues along which the enquiry could proceed, that undertaken now adopts equation (6) as its starting point, on the understanding that a time trend, t , constitutes the residual element of the vector Z_j or, alternatively stated,

$$(6a) \quad \frac{w_i}{w_j} = w_{ij} \left(\frac{L_i}{L_j}, Q, t, Z \right)$$

Referring back to section III, the first point which needs to be made is that the ratio to be explained is an earnings, rather than a fixed time rate, quotient. It would appear that most manual employments, which it will be remembered are here the true object of analysis, afford premium payments for hours worked beyond what is accepted as some nominal "standard week". This generates, in simple text-book terms, a non linear choice constraint for the worker and means that hours worked can affect average hourly earnings statistics. It is also obvious, and trivial to prove, that the relative average hourly earnings of two groups of worker, i and j , will be positively related to their relative hours of work if at least i works overtime hours which are rewarded at a premium rate. Thus let E_i and E_j represent their relative hourly earnings then

$$(10a) \quad \frac{E_i}{E_j} = y = \frac{w_i^{\circ} H_i}{H_i} = \frac{w_i^{\circ}}{w_j^{\circ}} \quad H_i, H_j \leq \hat{H}$$

$$\frac{w_j^{\circ} H_j}{H_j}$$

$$(10b) \quad \frac{E_i}{E_j} = y = \frac{\frac{w_i^{\circ} \hat{H}}{H_i} + \frac{w_i^{\circ} (1+p)(H_i - \hat{H})}{H_i}}{\frac{w_j^{\circ} \hat{H}}{H_j} + \frac{w_j^{\circ} (1+p)(H_j - \hat{H})}{H_j}} \quad H_i, H_j > \hat{H}$$

Here \hat{H} is the (assumed common) standard work-week, p the common overtime premium, w_i° and w_j° the ordinary time rates for i and j and H_i and H_j their total hourly weeks of work. Then, from (10a), if no overtime is worked,

$$\frac{dy}{dH_i} = 0$$

and average hourly earnings do not respond to hours of work.

However, if premium rewarded hours are worked then (10b) yields:

$$\frac{dy}{dH_i} = \frac{w_i^{\circ} p \hat{H}}{\left[w_j^{\circ} (1+p) - \frac{w_j^{\circ} p \hat{H}}{H_j} \right]} \quad H_i^2$$

$$= \frac{w_i^0 p H}{\left[w_j^0 + p w_j^0 - p w_j^0 \frac{\hat{H}}{H_j} \right] H_j^2} > 0$$

as $0 < \frac{\hat{H}}{H_j} < 1$ by assumption.

This then presents the case for including relative hours of work in the relative earnings equation. Whilst the hours of work of any individual group may track the cycle, and hence be adequately captured by the output term in (6), it is not clear that the ratio of two groups' hours will necessarily do the same, thereby further strengthening the argument. But it must be admitted that there is here a potential problem of simultaneous equation bias, for standard theory also has hours supplied as a function of the wage rate which itself is an important determinant of earnings. Strictly speaking, the consequences of this are biased and inconsistent parameter estimates, although, as discussed more fully in the context of unemployment and earnings in Chapter 6, the practical consequence of this are often not severe.⁽³⁴⁾ Nevertheless the caveat remains.

More or less implicitly, the assumption has so far been made that the labour under discussion is homogeneous. This, of course, is unrealistic and one expects more productive, or higher quality, labour to earn more than less (economically) productive. Numerous theoretical traditions examine this issue in some considerable detail, of which the most familiar is probably the work on human capital. Here, however, some very simple reasoning, in the spirit of the job competition models that have recently been proposed, will be examined.

Perhaps the most notable early exponent of this school was Thurow (1979), although it has also found a fair degree of support in more mainstream quarters. Thus Nickell argued, when discussing the standard job search model, that:

"Implicit in this model is the assumption that if an individual visits a firm he will be offered a job at some wage, presumably related to the firm's assessment of his current and future marginal product were he to work there. In practice, however, we know that individuals visit firms and simply receive no job offer of any description. In the light of this it behoves us to ask why a firm, rather than offer an individual his marginal product, will simply not offer him a job at all. The reason follows from a complex set of circumstances. Equity, customer, internal labor (sic) markets, union bargaining agreements, legal constraints, morale factors and difficulties in measuring individual productivity all combine to associate a particular wage with a particular job in any firm. So, at any point in time, given these factors, technology and the state of demand, the number of job slots and their associated wages are largely predetermined. This has two important short run consequences. First, wages are associated with jobs rather than applicants. Second, the wage level and number of job slots tend to be independent of the number of applicants. This implies that if an individual arrives at a firm and there are no job slots available with a wage which is low enough to be covered by his productivity, he will be turned away".
(Nickell (1979a) p. 1250, italics in original)

Similarly, Pissarides (1976), although in a slightly different context, also sees employees as rationally having the option of pursuing a fix-wage policy in his model of labour market adjustment.

One of the main thrusts of this line of reasoning is that a worker's (perceived) personal characteristics determine his, or her, eligibility for jobs in the employment hierarchy. Two of the most obvious, and frequently invoked, personal characteristics are age and educational qualifications.⁽³⁵⁾ Many pay scales are age related up to adulthood whilst many jobs also have eligibility criteria based on educational qualifications. As a manifestation of the first

phenomenon, the evidence has just been presented for ROSLA having been the cause of a rather large jump in young peoples' relative pay.

A very simple, but not totally vacuous, model can be invoked to demonstrate that age and education composition effects could in a fix-wage world, be responsible for changes in the earnings of young people relative to those of adults. Assume a single output Q is produced solely by labour input L , and in the aggregate

$$(11) \quad Q = f(L)$$

The labour variable is really, however, a composite of job, rather than worker, types each with an associated productivity. Thus, let there be $(n + 1)$ job types, L_1 to L_{n+1} where L_{n+1} jobs are filled solely by adults and by the L_1 to L_n jobs are filled by youths according to their age and educational qualifications - these being assumed to be the only characteristics available to employers by which they can screen applicants.

The jobs, or tasks, are hierarchical, in the sense that the productivity of job i is less than that of job $(i + 1)$. Furthermore, it is assumed that the aggregate labour index is a simple linear function of the jobs identified in the hierarchy. That is

$$(12) \quad L = L_1 + (1 + \lambda_2)L_2 + \dots + (1 + \lambda_{n+1})L_{n+1}$$

and

$$0 = \lambda_1 < \lambda_2 < \lambda_3 < \dots < \lambda_{n+1}$$

and workers are paid the marginal product of the jobs in which they

work.⁽³⁶⁾ Employers are assumed to advertise vacancies when their total labour stock is less than necessary to produce their desired output. Subsequent applicants for the job(s) are interviewed on a first come, first served basis and are appointed to a job type i according to their characteristics.⁽³⁷⁾

In these circumstances, age and educational qualification changes will have effects on the relative earnings of youths to adults, defined as

$$(13) \quad \frac{w^Y}{w^A} = \frac{\frac{w_1 L_1 + w_2 L_2 + \dots + w_n L_n}{L^Y}}{\frac{w_{n+1} L_{n+1}}{L_{n+1}}}$$

where:

w^Y = average youth earnings

w^A = average (fixed) adult earnings

$L^Y = \sum_{i=1}^n L_i$ = total youths employed

L_{n+1} = total adults employed.

without there having been any change in job relativities. As a specific example of this consider a world in which there are three junior labour grades, one senior grade and there is no excess supply

of workers. For concreteness let the three non-adult grades (L_1 , L_2 , L_3) be filled by young people aged 15, 16 and 17 years respectively with $w_1 = 1$, $w_2 = 2$, $w_3 = 3$. Let there further be a "steady-state" population with 20 units at each age and the adult wage be $w_A = 4$. Then the youth to adult wage relativity is

$$\frac{w^A}{w^y} = \frac{\frac{w_1 L_1 + w_2 L_2 + w_3 L_3}{3}}{\frac{w^A L_A}{L_A}}$$

$$= \frac{(1)(20) + (2)(20) + (3)(20)}{60}$$

$$= \frac{4}{4}$$

$$= 0.5^{(38)}$$

Let ROSLA remove the 15 year olds from the market then, at the first enumeration following this

$$\frac{w^y}{w^A} = \frac{\frac{w_2 L_2 + w_3 L_3}{3}}{w^A}$$

$$= \frac{(2)(20) + (3)(20)}{\frac{40}{4}}$$

$$= 5/8$$

But this is an exceptional year. All else equal, the following years should see forty 16 year olds in work and twenty 17 year olds, giving a new steady-state age differential of

$$\frac{w^Y}{w^A} = \frac{(2)(40) + (3)(20)}{\frac{\sum_{i=1}^3 L_i}{4}}$$

$$= 7/12$$

This then provides one, simplified, example of how compositional changes could cause a positive movement in the youth earnings differential which is consistent with their full employment. But note how this result has depended crucially on there not being excess supply of any grade of labour, even in the hypothesised fix-price world. (39)

This suggests that variables such as age and educational attainment might be valid arguments in a model designed to explain relative earnings movements. Unfortunately, however, educational attainment statistics are not available on a usable basis for most of the data period. But, to the extent that the average age of youths in the labour market reflects later school-leaving, and this corresponds

to higher attainment, then the age variable should be tracking both influences. In its annual labour force count the DE used to produce estimates of the number in each unit age at the time of each (mid-year) enumeration.⁽⁴⁰⁾ On the assumption that each youth is aged exactly at the mid-year point this enables the average age of youths in the market to be calculated, where youth is as defined by the October earnings figures.⁽⁴¹⁾ For young males under 21 this increased from 17.99 to 18.50 years, whilst for females less than 18 the increase was more modest, from 16.64 to 16.79. These average age figures may be expected to be positively correlated with the earnings relatives.

To some extent these fix wage models take their lead from the work of those who argue that wage setting is to a large degree an institutionalised phenomenon. Early writers in this tradition include Ross (1948) and Wootton (1955) but they quickly found support in certain sections of the more conventional economics profession. Hicks, for instance, wrote that;

"It has never been the general rule that wage-rates have been determined simply and solely by supply and demand. Even on pure grounds of efficiency, it is desirable that the wage which is offered should be acceptable, acceptable both to the worker himself and those with whom he is to work".

(Hicks (1955)) p.390)

and he went on to suggest that:

"We get a better clue to actual behaviour if we think of wages as being determined by an interplay between social and economic factors, instead of being based on economic factors - and crude economic factors at that - alone".

(Hicks (1955) p.394)

To some extent the traditional apprenticeship mode of employment and training could be seen as an institution designed to protect pay differentials - although it can equally be afforded more economic justifications.

To attempt to discriminate between the various rationale for different training modes and the outcomes they generate is a major task and it is not attempted here. Rather, attention will be focussed on some fairly general propositions about the apprenticeship system in Great Britain and its effect on the relative earnings of young people. In the first instance this will concentrate once again on how compositional changes could affect earnings relatives without there necessarily having been any change in the rates of pay for different jobs. Thus, consider a labour market comprising two sectors, S and T. Within the former, the apprenticeship sector, there are two types of job, 0 and 1, with unique productivities, and therefore wages, attached to them (w_0^S and w_1^S). In the second sector, T, there is only one type of job with attached wage, w^T . Young people, it is assumed, are only eligible for type 0 jobs (apprenticeships) in S, and can enter the sole employment in T. Adults, on the other hand, can either take type 1 jobs in S (if qualified) or the sole job type in T. Further assume that

$$w_0^S < w^T < w_1^S$$

then the aggregate average wage of youths relative to adults is given by

$$(14) \quad \frac{n_Y^S w_0^S + n_Y^T w^T}{n_A^S w_1^S + n_A^T w^T} = \frac{n_Y^S + n_Y^T}{n_A^S + n_A^T}$$

where n_A and n_Y refer to adults and youths employed respectively. A ceteris paribus shift of youths from sectors S to sector T will then clearly increase their relative earnings using arithmetic analogous to that utilised in the proceeding example.⁽⁴²⁾

Obviously the above example is oversimplified but it does serve to illustrate the kind of tendencies invoked in wage relativities if youths move from sectors with strict age related pay to others where this is not the case. Such linking of young peoples' wages to age can be argued to be closely linked to the formal apprenticeship mode of training.⁽⁴³⁾ With the changing nature of industry's labour requirements from traditional skilled manual trades the need for apprentices, in the historic sense, may well have declined. To the extent that alternative types of employment have wage payments less rigidly linked to a 5 year training programme this may have served to bring down the average age at which adult rates of pay are received, and consequently increased aggregate relative youth earnings.⁽⁴⁴⁾

There are several ways in which this effect may be rationalised. On the one hand, more efficient, and thereby shorter, training methods may be substituted for the old system. On the other hand, many of the

skills for which employees were traditionally apprenticed were very "mobile", and the training for them could be classed as "general", in the Becker (1964) sense. In the human capital scenario workers undergoing such training are required to finance a good proportion of it themselves, in the form of reduced current wages. If alternative, newer employments and training are more firm-specific then one might expect this to be reflected in higher average wage payments to young workers.⁽⁴⁵⁾

The upshot of these arguments is that relative youth wages will be negatively related to the proportion of youngsters undertaking apprenticeship training. Under the old NI card system, the DE was able to publish statistics on the first employment destinations of school-leavers. This information was available, inter alia, by industry and by broad occupational category.⁽⁴⁶⁾ The number entering apprenticeships is clearly not the same thing as the number actually so employed. However, in general, further information is not available and, as in Lindley (1975), the number of entrants will be taken to proxy the number engaged.⁽⁴⁷⁾ One defence of this procedure is that indentured apprentices are not normally viewed as easily fired. Nevertheless, the caveat remains.

The DE figures do not allow any detailed breakdown of the type of apprenticeship undertaken, differentiated, for example, by years of planned training. It might be felt, however, that those in the traditional manufacturing industries correspond most closely to the formal five year mode. For this reason, the proportion of job entrants entering apprenticeships in total and those so doing in manufacturing will be used as alternative measures of the hypothesised

influence. Over the period 1950-1972 the proportion of male first time job entrants who went into apprenticeships in all industries actually increased from 33.8 to 38.7 per cent. However, the proportion entering them in manufacturing declined from 20.2 to 12.5 per cent.⁽⁴⁸⁾ The percentage of girls entering apprenticeships remained more or less static over the whole period, falling only from 8.0 to 7.9 per cent. The proportion entering apprenticeships in manufacturing, however, fell from 4.9 to less than one-half of one per cent of all female school-leavers labour force entrants in 1972.

Any discussion of training in this period and its possible impact on relative earnings would be incomplete if no reference was made to a piece of legislation which held out the promise of quite radical change. This was the Industrial Training Act, (ITA) of 1964. It introduced the Industrial Training Board network with its levy/grant powers designed to increase the amount of training in industry, improve its quality and redistribute the costs of training more equitably between firms. Whilst the scheme was not universally acclaimed to be successful, and indeed was modified in 1974, Woodhall (1974) concluded that the Act had served to at least increase the volume of training over its lifetime. Woodhall's survey of the literature and the evidence therein revealed no consensus regarding the success of the measure in achieving its two remaining aims. However, the possibility that its provisions, particularly those regarding quality, served to increase the productivity of apprentices and thereby increase their relative wages cannot be ignored.

Focussing solely on these quality provisions, if one makes the strong assumption that the jobs for which individuals were receiving

training required a fixed vector of skills, the marginal product of each element of which was zero once the minimum permissible level had been achieved, then improved, cost-effective, training would seem to imply shorter training. This seems to be what happened with the traditional 5 year schemes being replaced by 4, and even 3 year periods of apprenticeship. Assuming further that employers reorganised the work schedules of their trainees to make fuller use of their more quickly acquired skills, and increased their rates of pay in accordance, then one might expect that the ITA would increase the earnings of youths to adults in affected industries. Perusal of the Department of Employment's Time Rates of Wages and Hours of Work publications does indeed suggest that the journeyman - apprentice differential fell over the period in many cases and therefore it seems appropriate to consider whether the casually inferred relationship between this and the ITA is borne out statistically. But the severity of the assumption that the productivity of adult jobs, and hence their wages, were unaffected by the act should be recalled. If in fact better trained youths led to a more productive adult labour force then the long-run impact of the legislation is a priori unclear. Caveats aside, the practical problem is to control for the ITA and this will be discussed in the empirical section which now follows.

(b) ESTIMATION

The case has been made above for the extension of the very simple model of relative earnings derived in Section VI.i. But even though the discussion was quite wide ranging, the claim cannot be made that it was exhaustive. In particular, it probably errs in largely

ignoring developments which might have brought about changes in adult earnings. Nevertheless, those influences which were considered merit statistical investigation as a first step towards a potentially greater understanding of the determinants of the earnings of young people relative to those of adults. To recapitulate, it has been hypothesised that these relativities will be determined by a function of the form

$$(15) \quad \frac{w_i^Y}{w_j^A} = w_{ij}(Q, \frac{L_i^Y}{L_j^A}, AGE_i, APP_i, \frac{H_i^Y}{H_j^A}, ITA, t)$$

with expectations on the first derivatives

$$w_{ijk} > 0 \quad (k = 1, 3, 5, 6)$$

$$w_{ijk} < 0 \quad (k = 2, 4)$$

$$w_{ijk} > 0 \quad (k = 7)$$

Here

$\frac{w_i^Y}{w_j^A}$, Q , $\frac{L_i^Y}{L_j^A}$ and t are as previously detailed, AGE_i is the average age of youths in group i in the labour force, APP_i is the proportion of them entering apprenticeships as their first employment, H_i^Y/H_j^A is the average hours of work relative between youth group i and adult group j and ITA is some control for the industrial training act. (49)

Recalling that two alternative measures of the apprenticeship variable have been proposed this left a core of eight equations to estimate. But the problem remains of how to capture the potential

influence of the ITA. Unfortunately, this is an exercise in artificial variables and to undertake anything other than simple experimentation, with no further information, amounts virtually to accepting the hypothesis that the act did have some effect, and then choosing the most well determined series of (almost) arbitrary numbers and arguing that their pattern reflects the operation of the legislation. In recognition of this difficulty just two variants were investigated. The first is a traditional binary dummy variable, D1, with the discontinuity occurring in 1964. Such a measure, however, assumes that the act had immediate, once-over, effects. Whilst a good proportion of the evidence produced by Woodhall (1974) does, in fact, suggest that its major impacts were felt in the short-run, although not immediately, the arguments were not presented as conclusive. Therefore, the alternative specification explored assumed that the ITA had a gradual impact. This was done by the inclusion of a second time-trend, D2, but one which had a zero gradient prior to 1964. However, the implication that the act had a constant marginal impact on the earnings ratios in each year following its passage might seem to some as unreasonable as the simple dummy variable formulation.

As there was some indication of autocorrelation when the models were estimated by OLS, it was decided to use the Beach and MacKinnon autoregressive procedure cited earlier. However, the problem of multicollinearity was also apparent. This is a common malaise in time-series exercises and it is in general fairly intractable. When it occurs, individual coefficients are *unstable* and standard errors are inflated - although the overall performance of the model is unaffected and can be used for forecasting purposes. One possibility is to start removing variables to cope with the problem.

But usually this introduces specification error and the omitted influences then remain to be captured by the error term which, in consequence, becomes non-random and hence violates a maintained hypothesis of the estimating technique. However, here it might be regarded as defensible to drop the catch all time trend as the included tangible influences capture most of the variance in the dependent variable. This certainly improved the remaining t-statistics and these are the results reported. But there is no satisfactory way of dealing with any further such problems which remain. (50)

However, there remains a core of 16 equations to report before any lags in the posited relationships are even considered. For presentational purposes, therefore, some further selectivity is required. In general, specifications in current magnitudes could not be bettered by any of the, admittedly fairly crude, lagged formulations attempted. Attention is thus restricted to the former. Further, in the case of young males, the equations incorporating the simple dummy formulation for the ITA perform better than those using the alternative specification, and so these are the ones presented in Table 6. But such a clear pattern did not emerge in the young females' equations. In those using adult males as the comparator it was easier to differentiate between the alternative definitions of the apprenticeship variable, with that using the total measure being better than that covering only the manufacturing sector and these are therefore the reported results. However, when the comparator group was adult females, the manufacturing variable produced slightly better t-statistics, although with little other difference, and the equations using this measure are tabulated.

TABLE 6
ARI ESTIMATES

	C	RELATIVE HOURS	AGE	TOTAL APPS.	MAN. APPS.	D1	GDP	RELATIVE SUPPLY	ρ	R^2	D.W.
BOYS TO MEN	1.034 (4.55)	0.480 (4.17)	0.051 (4.91)	0.002 (4.28)		-0.005 (1.71)	0.001 (7.48)	0.003 (0.71)	-0.285 (1.23)	0.977	2.032
BOYS TO MEN	-0.994 (3.99)	0.265 (2.34)	0.061 (5.37)		0.001 (3.61)	-0.007 (1.92)	0.002 (7.35)	0.011 (2.36)	-0.008 (0.03)	0.989	1.998
BOYS TO WOMEN	-1.545 (4.49)	0.454 (3.68)	0.088 (4.23)	0.002 (3.24)		-0.015 (2.39)	0.002 (6.27)	0.005 (0.73)	-0.441 (2.00)	0.997	2.005
BOYS TO WOMEN	-1.981 (5.46)	0.506 (3.67)	0.111 (5.32)		0.002 (2.63)	-0.015 (2.25)	0.002 (6.09)	0.008 (1.20)	-0.436 (2.00)	0.998	2.138

Continued.....

TABLE 6 (Continued)

	C	RELATIVE HOURS	AGE	TOTAL APPS.	ΔI	DZ	GDP	RELATIVE SUPPLY	ρ	\bar{R}^2	D.W.
GIRLS TO MEN	-1.938 (1.40)	-0.060 (0.29)	0.142 (1.74)	0.003 (1.07)	-0.005 (0.35)		-0.001 (1.40)	0.369 (0.74)	0.145 (0.58)	0.808	1.821
GIRLS TO MEN	-0.859 (1.10)	-0.294 (1.30)	0.091 (2.33)	0.004 (1.63)		0.004 (1.71)	-0.001 (2.67)	0.946 (1.66)	-0.114 (0.45)	0.652	2.000
GIRLS TO WOMEN	-1.747 (0.87)	0.333 (0.51)	0.113 (0.87)	MANGAPP 0.005 (0.76)	-0.008 (0.36)		0.001 (1.22)	0.623 (1.37)	0.421 (1.69)	0.949	1.544
GIRLS TO WOMEN	-1.059 (1.36)	-0.680 (1.42)	0.130 (2.92)	0.017 (2.95)		-0.015 (4.12)	0.004 (3.70)	-0.571 (1.52)	-0.060 (0.23)	0.794	1.930

T-STATISTICS IN PARENTHESES

Turning first to the boys to adult males earnings relative one can see that there remains strong statistical support for the hypothesis that it behaves pro-cyclically. But the other original regressor, relative supply, remains perversely signed and achieves significance in the specification using entrants into manufacturing apprenticeships. Note also that whichever apprenticeship measure is used both are signed counter to prior expectations and significant. Whilst no clear expectation emerged about the ^feffects of the passage of the ITA, the current data suggests that the act tended to reduce the earnings of young relative to older men. Whilst the coefficients are not quite significant at conventional test levels, they come sufficiently close to achieving this to generate the suspicion that the ITA, or some similarly timed occurrence, did operate to widen the differential.⁽⁵¹⁾ There also appears to be quite clear evidence that the relative earnings of male youths to adult men responds positively to the average age of the former in the labour market. Equally, the relative hours variable was as per expectation, being both positive and significant.

Turning to the equations attempting to explain the earnings of male youths relative to adult females an almost identical picture emerges. Thus, whilst, as one would expect, there are differences in the size of most coefficients the sign pattern remains unchanged. In terms of significance levels, the principal developments are that now the dummy attempting to capture the operation of the ITA is significant, whilst the relative supply measure is never so. This latter finding is more favourable to the standard theoretical reasoning presented earlier, although the t-statistics remain uncomfortably large. But one cannot even say this much about the

apprenticeship variables, both of which run significantly counter to prior expectation.

The equations attempting to model the relative earnings of young females do not perform as well as those for young men. Thus firstly, whilst their earnings relative to older women do appear to move procyclically, the opposite seems to be the case when adult males are the comparative group. It might be possible to rationalise the latter finding by arguing along the lines that the jobs of the least productive, and lower paid, girls disappear in recessions more rapidly than those of adult males, with wages remaining sticky. But this seems slightly contrived given it is the only case in which the coefficient on output is negative. Once again the relative supply variables are perversely signed in all instances, but never significantly so. Looking at the newly added variables, those proxying the proportion of girls in apprenticeships are incorrectly signed, as in the case of young males, although only significantly so in the final equation. Also, as in the boys case, the bulk of the evidence suggests that the ITA negatively depressed the relative earnings of young females, but one can only invoke solid statistical evidence to support this conclusion when adult females are the comparator group and the dummy/time-trend is used to capture the act. The age variable is always correctly signed, and significant when D2 is used rather than D1, and promotes confidence in a general conclusion about this influence given the results obtained for young males. Lastly, however, relative hours are incorrectly signed on three occasions with fairly high, but not significant, *t*-statistics in two of them. This would appear to be a particularly

difficult finding to rationalise, save for the fact that the data is highly aggregative.

Given the overall goodness of fit of the equations, as signalled by the \bar{R}^2 's, the seeming lack of residual autocorrelation problems, as evidenced by the DW statistics, and certain regularities across the models for males and females, it is reasonable to venture some general conclusions about the analysis. As possible rationalisations of the behaviour of the relative supply variables were put forward earlier it can just here be noted that they were consistently perversely signed. But, with the exception of girls compared to men, the relative earnings of young people seem to be sensitive to the cycle in the hypothesised manner. It is, therefore, perhaps tempting to surmise that the present problems they face should to some extent be self-righting, unless the structure of the market has changed beyond the estimation period. But even if market clearing tendencies are established, it cannot, with the available information, be estimated how long this process would take to evolve unaided. There is also strong evidence to suggest that the relative earnings of young people are positively associated with the average age of those of them who are in the labour market. If age simply reflects productivity then this might be seen as an equilibrium phenomenon; but if it represents a facet of a pay structure which maintains artificial differentials, then a ceteris paribus older youth labour force may be expected to face increased employment problems.

The results indicate that the proportion of young people entering apprenticeships as their first job destination, included to proxy the proportion of the stock of youth so engaged, is a positive

influence on their relative earnings. Prior expectations were not, therefore, confirmed with the current data set. One possible explanation is that the chosen measure does not in fact adequately reflect the stock of apprentices. A second is quite simply that the maintained hypothesis is incorrect. That is, it is not true that the average earnings of those engaged in apprenticeship training are lower than those of other young workers. Unfortunately, it is not possible, with the available data, to answer this question directly. Maintaining the training theme, the bulk of the evidence suggests that the ITA actually served to depress the relative earnings of young workers. Taken at face value the inference is that the act had a larger impact on the quality of older workers than it did on that of youth labour. But one might note that statistically the strongest results occurred in the equations modelling youth earnings relative to those of adult females. The variables attempting to capture the effects of the ITA might conceivably therefore be picking up the operation of the Equal Pay Act of 1970. Such an interpretation is the more plausible the more employers anticipated the legislation and the less young, as opposed to older, females benefited from such preemptive action. However, the possibility of multiple rationalisations is a common, adverse feature of dummy variables and any conclusions regarding the ITA's impact on earnings should probably be guarded.

Finally, it remains to comment on the relative hours of work variables. In the young males' equations these work as per expectation; but three-quarters of those in the females' equations are negative, albeit not significantly so. These latter findings are

counter-intuitive and suggest that compositional changes may have been taking place which the model does not take account of. Alternatively, they may be of a manifestation of the simultaneous equation bias which may be affecting the results, as noted earlier.

VII. CONCLUSION

Simple economic theorising suggests that the wages of young people will play a vital role in determining their fortunes within the labour market. As a result of this much energy has been expounded arguing that the root cause of their current unemployment problem is that their wages are "too high". A brief glance at the data which is normally used to support this claim, the October Earnings and Hours Inquiry figures, does reveal that, relative to adults, their pay did increase in the early to mid 1970's. But this does not constitute a proof that they thereby became excessive.

In the first place, very little attention is normally paid to the problems that exist when the October data is used for deduction or analysis. A section of this chapter attempted to present a coherent listing of these difficulties and these proved formidable enough to suggest that one should not unreservedly accept conclusions based solely on this source of information. But, notwithstanding the doubts raised, this data does provide a useful time series summary of the behaviour of one measure of young peoples' pay. Inspection of it reveals that the 1970's did not constitute the only period in which movements occurred in their nominal earnings relative to those of adults. A much neglected exercise in the literature on the youth labour market is critical appraisal of why such movements occur.

An attempt at such an exercise therefore constituted a significant portion of the work of the chapter. This proceeded in two stages. Firstly, the reasons which have been suggested for the rise in youth earnings were re-examined. Those referring to the effects of ROSLA, pay restraint and the sex discrimination legislation would appear to stand up to scrutiny, although disentangling their separate effects would pose difficult problems. But it is not necessarily true that the movements in nominal earnings which they might have brought about were harmful to young workers. Thus age and productivity may be positively related and the effect of ROSLA on earnings may simply be a manifestation of this. Furthermore, the impact of pay policy and the sex discrimination acts on nominal earnings may, to some extent, have been confounded by movements in other elements of the "real" cost of labour.

The second strand of the attempt to explain movements in the relative earnings of young people was a statistical exercise using data for the period 1950-1972. From this it would appear that their relative pay is cyclically sensitive. To some this would suggest that the market for youths has a self-clearing tendency : although dual labour theorists and radical economists see no logical connection between unemployment and wage movements (e.g. Piore (1979)). In support of this latter view one can cite the finding that there is no evidence that relative labour supply affects relative pay. But this does not complete the picture. Statistical support was also found for the existence of a positive relation between relative earnings and both relative hours of work and the average age of young workers. Neither of these need logically be a cause for concern and should urge

caution in rash interpretations of movements in the October series. But whether the structure of the market has remained stable beyond the estimation period is a question that remains unanswered. For now attention returns to the issue of whether the earnings of young people appear to have influenced their labour market success, beginning with their employment.

- (1) There is no overlapping data at 1970 to allow of a crude "correction factor" calculation.
- (2) No contrast to the October figures arises from an examination of those for April in earlier years.
- (3) But see below for definitional changes.
- (4) In contrast to youths, however, the same source also suggests that part-time female workers do not receive training.
- (5) The issue of (female) part-time working constitutes an area of study in its own right, although one which has only recently begun to receive serious attention. For different approaches to the phenomena see Bosworth and Dawkins (1981a), Robinson and Wallace (1984) and Disney and Szyszczak (1984).
- (6) Unless otherwise stated part-time workers are taken to be those working less than 30 hours per week.
- (7) The classic reference on labour cost amortisation ("periodic rent") is Oi (1962). More recently Ehrenberg and Smith (1982) provide evidence that U.S. manufacturing fringe benefits rose from 20.3 to 37.3 per cent of payroll costs during the period 1957-77. For a recent survey of British fringe benefits see Green et. al. (1984).
- (8) The extent to which all agents actually discount tax financed goods and services is an unresolved empirical question.
- (9) It is not possible to be very precise about the distribution of youth earnings using published data but the NES showed that in 1984, when the national insurance limit was £34 per week, 44 per cent of males less than 21 earned less than £80 but only one-third of females aged less than 18 earned less than £50 per week. Conversation with the Department of Employment indicated that those in government jobs creation schemes are excluded from the NES.
- (10) On labour turnover and its determinants see Parsons (1977) who confirms that high youth turnover is, at least in part, caused by higher cet.par. quit propensities.
- (11) Note that by making assumptions about "standard hours" and the premium rate attached to overtime hours one can attempt to overcome this problem (see Addison (1976), p.58).
- (12) The NES figures in the Appendix exclude the effects of overtime payments.

(13) On the efficiency of overtime see Ehrenberg (1971) and on its prevalence in Britain see Leslie (1976) and Whybrew (1968).

(14) That is, the employer sets:

$$\frac{\partial Q / \partial H}{\partial Q / \partial L} = \frac{\partial C / \partial H}{\partial C / \partial L}$$

where Q is output, C is total cost, H is hours and L employees. The increase in post-war fixed employment costs has sometimes led to the presumption that overtime working will be optimal.

(15) But those receiving no pay at all are excluded.

(16) However, for such a trend to exist, technology, broadly defined, must presumably be changing.

(17) Wells (1983) does provide some counter evidence from the Time Rates of Wages and Hours of Work survey (Table 8 p.23), but this is based on a "survey" which is not described.

(18) Prior to this the manufacturing data had aggregated part and full-time female earnings on a 2:1 basis.

(19) Two important qualifications should be noted here: (1) the age figures differ for the earnings and employment figures; (2) the figures on which the young male percentages are based are from the NI card count and therefore include the unemployed.

(20) Wells (1983) shows that the main impact on the NES was delayed until 1974 owing to the fact that the survey is taken in April. See also below.

(21) It is not here being suggested that youths as a group should, in general, be viewed as satisfying any reasonable criteria for identifying the low paid. The effects to be described are probably best thought of as a fortuitous side effect of incomes policy for those youths in work.

(22) A full description of all post-war incomes policies to 1979 can be found in Ingham (1981). Note there also, however, how all policies from the time of Wilson's "Statement of Intent" included low pay as an "exception".

- (23) Note that the October Inquiry will have understated the reduction in differentials as only 10% of male manual workers earned more than £76.9 per week (c. £4,000 per annum) per annum compared to the 10% of male non-manuals who earned more than £103.1 per week (c. £5,360 per annum). The figures for women are considerably lower in both cases. Data from the NES.
- (24) Note that the girls - adult male relative fell in 1975.
- (25) One feature of the legislation which might be of importance when considering young workers, however, is that it does not cover firms employing fewer than 5 workers.
- (26) For further discussion of the acts considered here and other female orientated labour market legislation in the 1970's see Elias (1980).
- (27) This is on the assumption that after 50 years the councils, however "institutional" they may sound, paid some cognisance to the operation of market forces.
- (28) This was not in fact greatly successful.
- (29) Whilst the earnings of part-time females are available for the estimating period, their numbers in work are not; therefore the female "labour supply" figures are an amalgam of full and part-timers. This is clearly a caveat, but one which is not pursued. The problem is not serious when considering the other groups as part-time working amongst them is very much a minority phenomenon.
- (30) Note that for equation (1) to be an accurate short-term formulation some adults must be in "competitive" jobs.
- (31) This is in the spirit of the references cited later in the paragraph. But long periods of disequilibrium, perhaps particularly of excess demand, seem hard to rationalise - see Hart (1984).
- (32) It should be noted that higher order patterns of autocorrelation may not be adequately controlled for by first-order techniques such as this.
- (33) But non-registration propensities are sometimes found to be quite high for young people (see e.g. Lynch (1984)).
- (34) There would also be a problem of statistically identifying any conceivable hours function to be estimated simultaneously with that for earnings.

- (35) There are, of course, clear similarities with the job market signalling literature pioneered by Spence (1974). That such practices can degenerate into socially costly credentialism has been viewed with concern by the O.E.C.D. (1977). Also for some British evidence see Jolly et. al (1980).
- (36) There has been a debate in the literature as to the legitimacy of forming aggregate labour input indices. In principle this procedure is invalid, although in certain empirical circumstances little is lost by so doing. See Berndt and Christensen (1974) for a review, bibliography and expansion of the above conclusion.
- (37) Applicants not reaching the standard required for the least productive jobs will be rejected. In reality, of course, applicants are rejected for skilled jobs and not offered unskilled work instead etc. This reflects not only the abstraction involved in assuming job substitutability but also a host of institutional constraints and rigidities.
- (38) If "education" is also used in allocating people then it is here assumed strictly proportional to age.
- (39) Note also that, in a more general framework, "perverse" occupational changes higher up the hierarchy, due say to shifts in the educational attainments of different cohorts, could conceivably outweigh the effects of an event like ROSLA.
- (40) This data included both employed and unemployed youths. In a strictly fix-wage world this would not matter. Alternatively, one has to make the assumption that these two groups have identical age distributions. Later reasoning renders this assumption unnecessary for adults.
- (41) With all adults assumed to be paid the same rate their average age is immaterial. To the extent that earnings are experience related, and this correlates with age, this is unrealistic. However, if earnings profiles "tail-off" in later years this will provide a partial offset.
- (42) This same result, of course, follows if adults become more concentrated in T. Thus, somewhat trivially, let a given number of adult workers be re-allocated more heavily in T.
- Then, if w^Y/w^A , and $dn_A^S = dn_A^T$, and $dn_A^S = -dn_A^T$ by assumption.

$$d = \frac{n_Y^S w_0^S + n_Y^T w^T}{n_Y^S + n_Y^T} \quad (n_A^S + n_A^T) (w^T - w_1^S) \quad dn_A^S > 0$$

$$\frac{(n_A^S w_1^S + n_A^T w^T)^2}{(n_A^S + n_A^T) (w^T - w_1^S)}$$

- (43) Suzuki (1976) provides an interesting international comparative study of static age-earnings profiles. Whilst the rates of pay of many groups of workers are found to be age related, there is more likely to be only one "scale" for manual workers whilst white collar employees may be promoted across scales. This provides a partial justification for the strong assumption in the text.
- (44) Whilst not strictly relevant in the present context, the debate over whether unions or management are responsible for the continuation of what are seen as outmoded forms of apprenticeship should be noted (Williams (1957), 1963), Liepmann (1960), Carter (1966)). For a more recent defence of trade unions in this area see Lee (1979).
- (45) There remains, of course, the question of whether lowering the age of majority merely formalised existing social and economic facts or was itself a trend setting piece of legislation.
- (46) An irregular sample survey was reinstated in 1978 but only for England and Wales.
- (47) Merrilees (1983) uses a stock measure for the engineering industry, but this is only available from 1963 on.
- (48) Models attempting to explain the demand for apprentice recruits can be found in Merrilees (1983), Ryrie (1976) and Lindley (1975). The decline in manufacturing apprentices is neither inconsistent with a model in which current output (Ryrie) or expected output (Merrilees, Lindley) determines demand.
- (49) More precise details of the variables can be found in the data appendix to this chapter.
- (50) For a detailed discussion of the problems of multi-collinearity see Johnston (1972, Chapter 5).

- (51) But note that when the dummy time trend, D2, was used it was positive, although with a standard error many times the size of the coefficient.

FIGURE A1 : YOUTH TO YOUTH HOURLY EARNINGS RELATIVES, EXCLUDING EFFECT OF OVERTIME 1974 - 1982

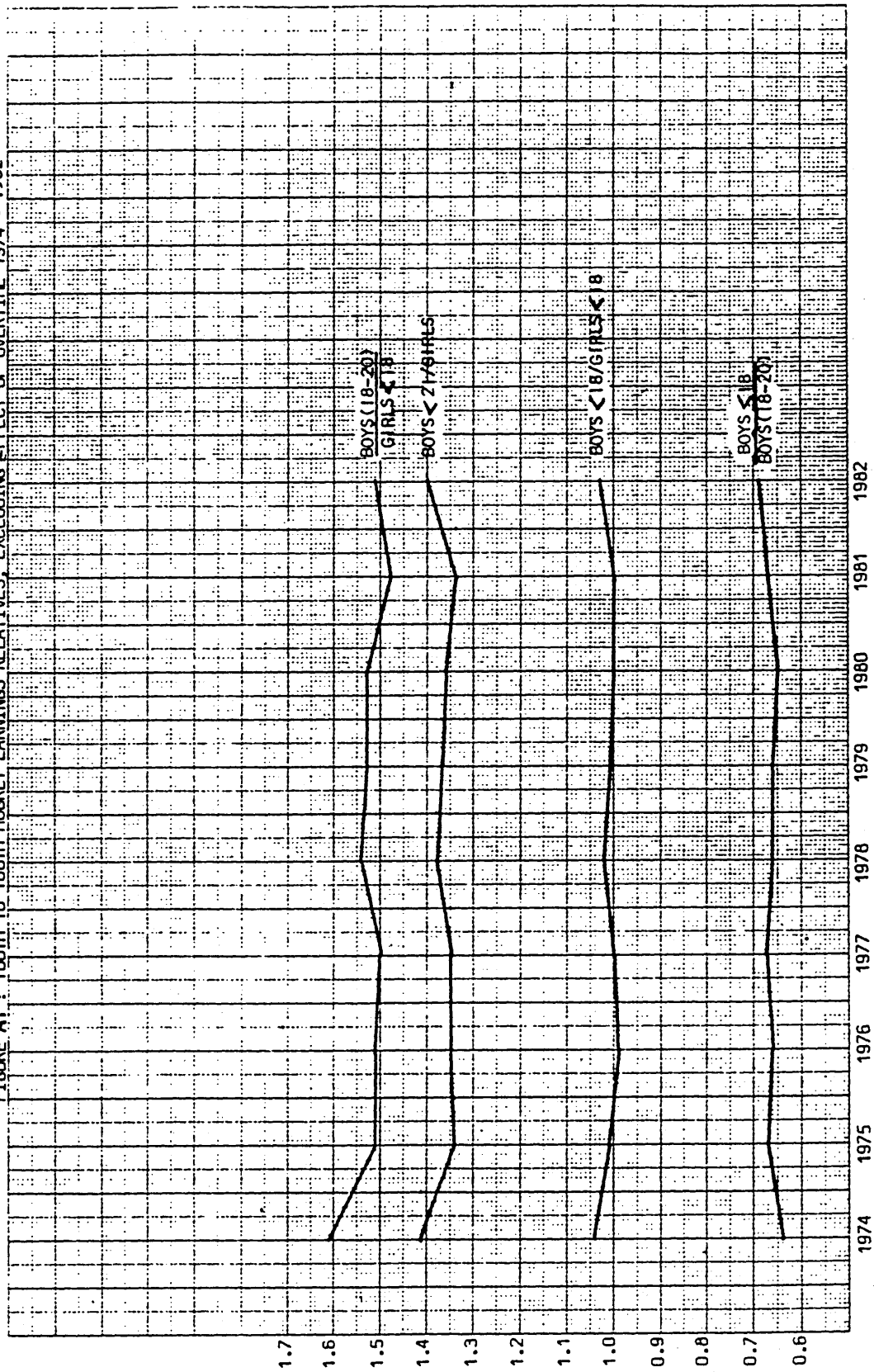


FIGURE A2. . . HOURLY EARNINGS RELATIVES TO PART-TIME FEMALES, EXCLUDING EFFECT OF OVERTIME 1974 - 1982

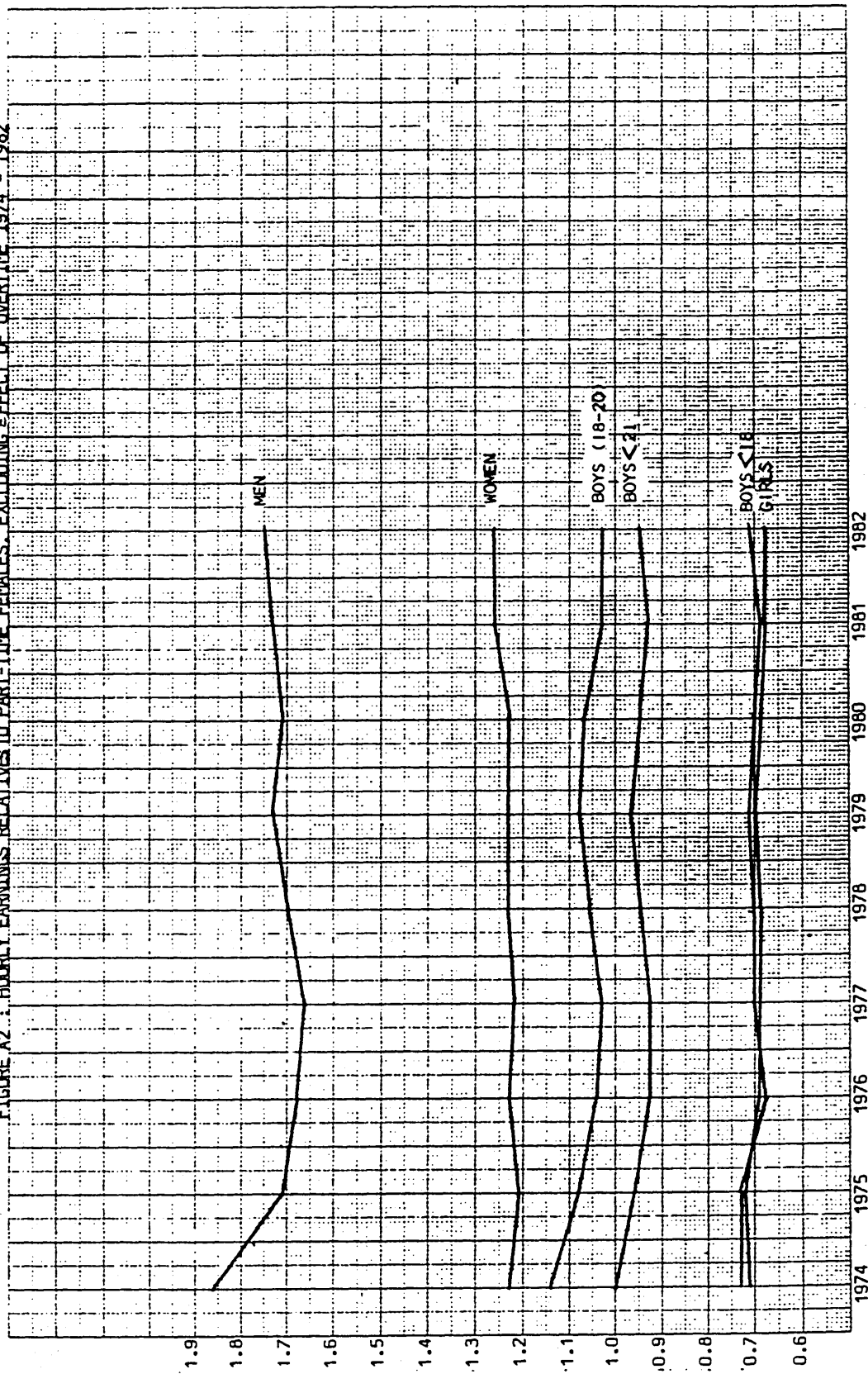


FIGURE A.3: BOYS HOURLY EARNINGS RELATIVE TO FULL-TIME ADULTS, EXCLUDING EFFECT OF OVERTIME 1974 - 1982

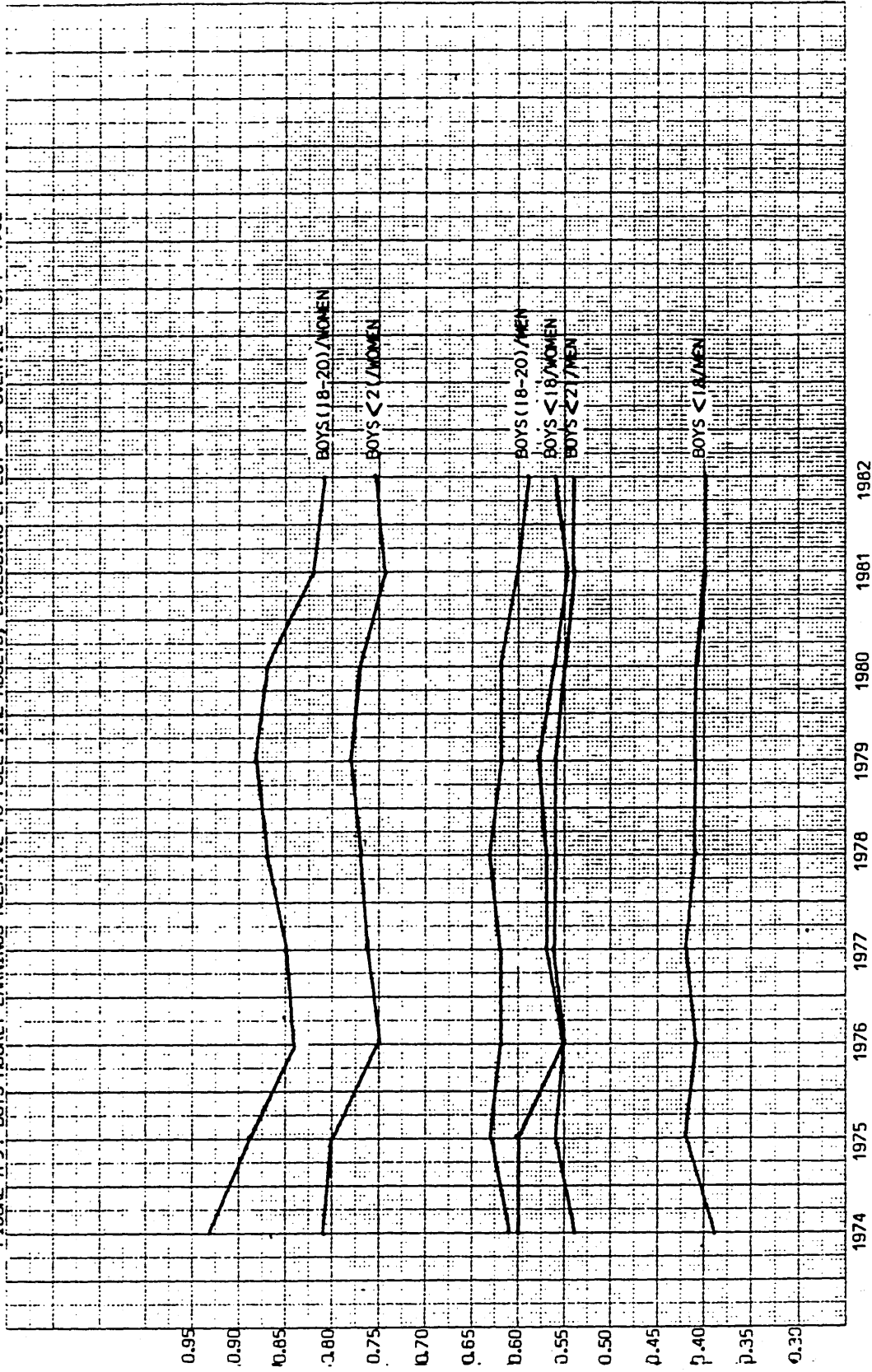


FIGURE A4 : FEMALE EARNINGS RELATIVES EXCLUDING EFFECT OF OVERTIME 1974 - 1982

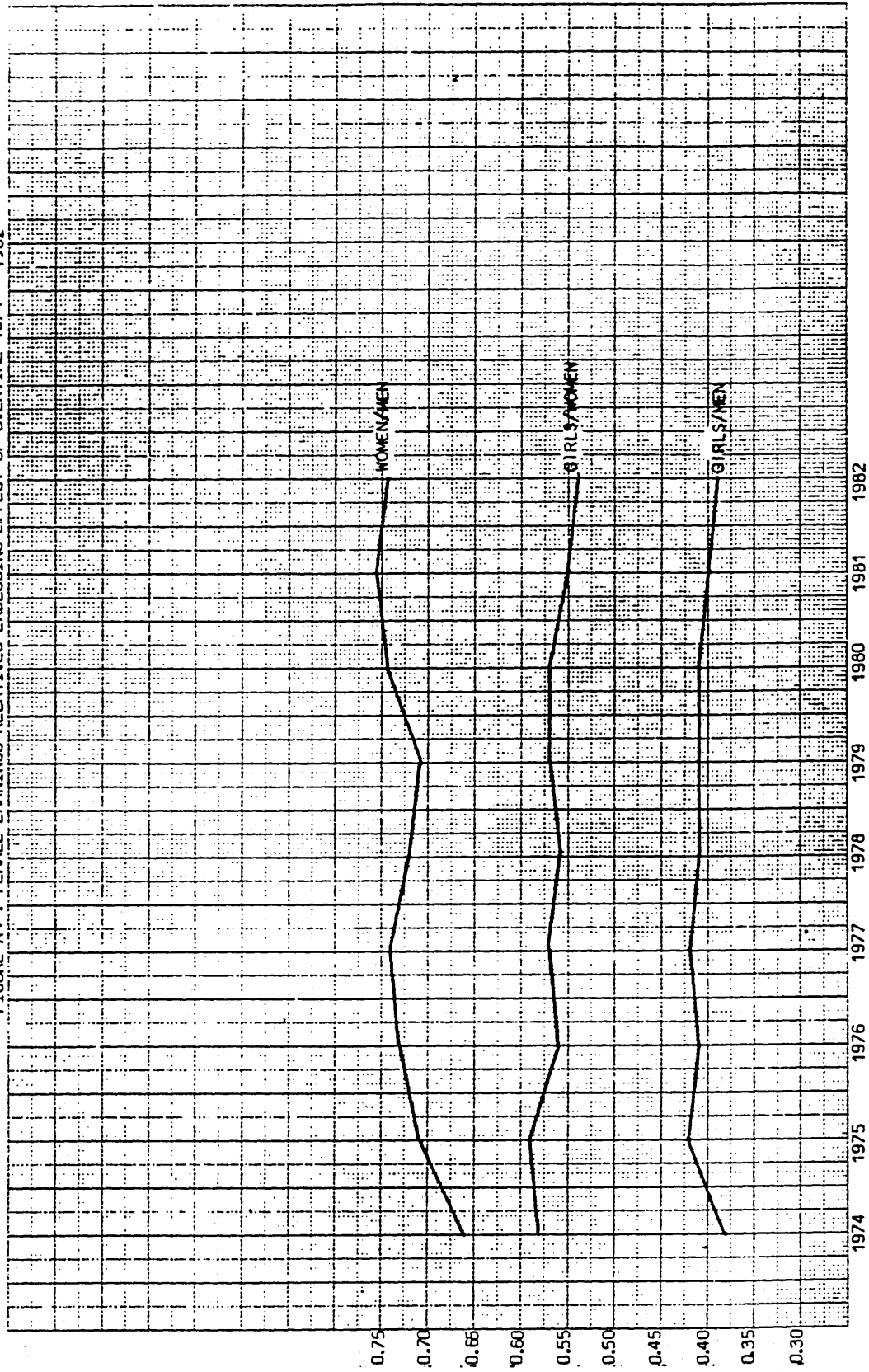


FIGURE A5 : HOURS OF WORK RELATIVES 1950 - 1982

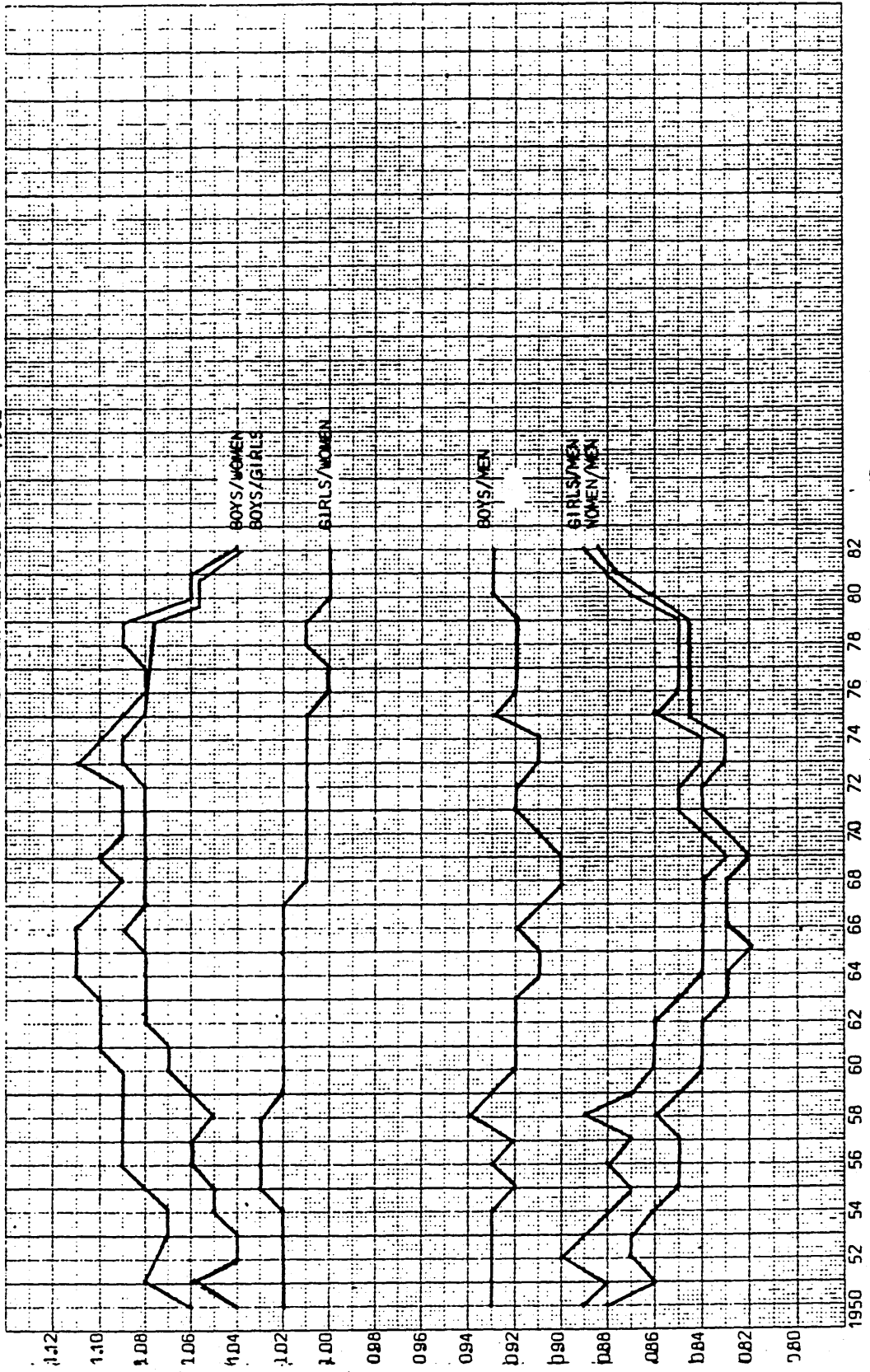
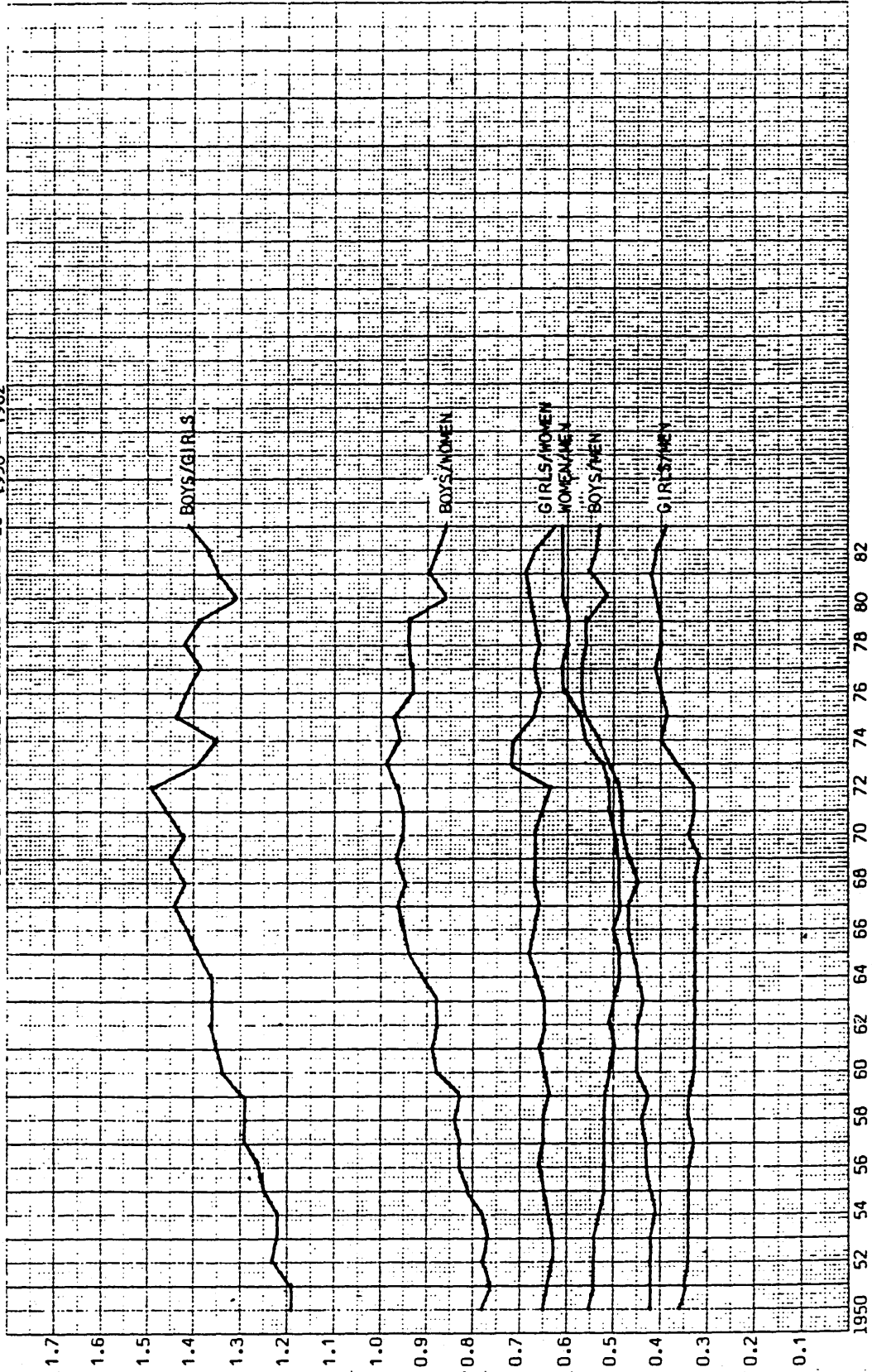


FIGURE A6 : WEEKLY EARNINGS RELATIVES 1950 - 1982



APPENDIX

Average Hourly Earnings
 Males <21, 21+
 Females <18, 18+
 Part-time females 18+

Department of Employment
 October Earnings and Hours
 Inquiry - Department of
 Employment Gazette Relevant
 Years

Labour Force (Employed plus
 Unemployed)
 Males <21, 21+
 Females <18, 18+
 Males <20, 20+

Annual mid-year National
 Insurance card count -
 Department of Employment
 Gazette

GDP Index (1975 = 100)

Average of Output, Expenditure
 and Income Indices - Economic
 Trends 1982 Supplement

Wholly Unemployed
 Males <20, 20+
 Females <18, 18+

Mid-year count of unemployed -
 Department of Employment
 Gazette

Average Weekly Hours of
 Work

Department of Employment
 Employment October Earnings
 and Hours Inquiry - Department
 of Employment Gazette Relevant
 Years

Average Age Youths in
 Labour Force (Employed
 plus Unemployed)

Annual mid-year National
 Insurance card count -
 Department of Employment
 Gazette

Number entering Apprenticeships

Young persons entering
 employment - Department of
 Employment Gazette, relevant
 years

D1

Dummy control for ITA, taking
 value 0 for 1950-1963,
 inclusive, 1 for 1964 onwards

D2

Dummy/time-trend control for
 ITA taking value 0 for 1950-
 1963 inclusive, 1, 2 3 ... for
 1964, 1965, 1966

CHAPTER 4

YOUTH EMPLOYMENT PATTERNS

1951-1981

I. INTRODUCTION

Whilst the pay of young people has received a good deal of attention in recent discussions of their unemployment problem, many students, both today and in earlier times, would show interest in whether any of their difficulties were structural in nature. Although this is not an entirely theoretically rigorous line of reasoning, it is one that has some appeal to those who do not accept that labour markets have short-term clearing characteristics.⁽¹⁾ Quite simply the idea is that if individuals are initially located in "sectors" (industrial, occupational or geographical) that suffer subsequent decline they are likely to have difficulties re-locating themselves if this decline involves their displacement. Concentrating on youths, the question becomes that of whether they have been disadvantageously placed, vis-a-vis other age groups in the market, in any of these ways and whether this might have had some bearing on the behaviour of their unemployment through time.

Clearly, certain strands of the literature lead one to expect that clustering, or segmentation, of particular groups in the labour force will occur. The modern day precursors of these developments are probably Kerr (1954) with his work on balkanised labour markets and Doeringer and Piore (1971) with their analysis of dual labour markets.⁽²⁾ But, in addition, two of the (related) hypotheses considered by Casson (1979) as being potentially relevant to an explanation of relatively high youth unemployment levels imply the existence of something like labour market duality. The first of these is the job-search hypothesis under which young people value relatively heavily the non-income attributes of employment. This

being because they do not have to share them, as opposed to any pecuniary returns, with their supporting family. The second is the life cycle hypothesis, under which young workers initially concentrate in low wage, poor career prospect industries/occupations; partially it appears for the reasons outlined above. Whilst these arguments are rather more supply side orientated than most true dualists would accept, they do point to potential concentration, which of itself can adversely affect groups heavily employed in sectors with declining fortunes. Such structural imbalances could be the cause of variations in young peoples' unemployment experience, as Freeman (1982) argues has been the case in the United States.⁽³⁾

This is a very large area, and the present study will concentrate on only one aspect of it; namely the industrial concentration of labour in the post-war period. For this purpose the four decennial Censuses of Population that have taken place in this era will be used, with the labour-force disaggregated by sex and by age into those less than, and those equal to or greater than, 20 years. The next section introduces the broad movements in employment which have occurred. Section III then goes on to discuss the data in use in somewhat more detail. Following this, Section IV goes on to a more detailed description of employment movements and looks at the issue of relative concentration across the groups under study. More substantively, Section V examines the movements which have taken place in the industrial distribution by means of shift-share analysis. A summary of the principal findings concludes the chapter.

II. EMPLOYMENT PATTERNS 1951-1981 : OVERVIEW

It is perhaps surprising to discover that, in spite of the depth of the recession, more people were actually in work in 1981 than was the case in 1951. But this bald aggregate statement hides many conflicting movements across particular groups in the labour force. For present purposes, one of the most interesting of these is that the employment of young people aged under 20 fell quite markedly and total employment only held up because of the exceptional (nearly 50%) increase in the number of older females on the national pay-roll. As shown in the last chapter, this latter has principally been due to the explosion in part-time working. This raises interesting questions about the level of true labour resource utilisation through time; although, unfortunately, not ones which can be pursued in detail here. However, this should serve to keep one alert to the frequently voiced argument that part-time females have been responsible for displacing young people at the work-place, on which a little more is said below.

Table 1 below presents the employment movements for the four age-sex groups that were recorded across the four censuses. But before considering the detail contained therein, two of the most interesting features are brought out. Thus, as stated above, total employment was nearly 800,000 greater in 1981 than in 1951. But further, whilst employment had decreased by just under 820,000 in the decade 1971-1981, total registered unemployment actually rose by nearly 1.7 million. At its very simplest this reflects an increase in recorded labour supply, and a more complete treatment of the issue would require an explanation of why the latter occurred.

This will be returned to at various points in the work, but now the year on year detail provided by the table will be explored.

Between 1951 and 1961 the employment of all groups increased in absolute terms. For young people this increase was more or less proportional to the increase in total employment which occurred, as witnessed by the essentially static percentage of the work force for which they accounted. Adult male employment, however, grew relatively slowly; a feature which was compensated for by the size of

TABLE 1. EMPLOYEES IN EMPLOYMENT

	1951	1961	1971	1981
MALES				
<20: ABSOLUTE	1,237,688	1,326,350	1,057,490	948,380
AS % TOTAL	5.6	5.7	4.5	4.1
20+: ABSOLUTE	14,071,334	14,422,110	13,974,060	12,816,340
AS % TOTAL	63.6	61.8	58.9	55.9
FEMALES				
<20: ABSOLUTE	1,201,034	1,229,620	937,770	814,850
AS % TOTAL	5.4	5.3	4.0	3.6
20+: ABSOLUTE	5,624,633	6,363,620	7,763,290	8,336,620
AS % TOTAL	25.4	27.3	32.7	36.4
TOTAL	22,134,689	23,341,700	23,732,610	22,916,190
% CHANGE IN TOTAL	-	+5.5	+1.7	-3.4

SOURCES : 1951, 1961, 1971, 1981 CENSUS OF POPULATION, ECONOMIC ACTIVITY TABLES.

the growth in adult female working. More interesting developments emerged in the years 1961-1971. Then the employment of both male and

female youth declined, by 20 and 24 per cent respectively. This compares to a total employment growth of something under 2 per cent, and is reflected in the reduced share of the workforce accounted for by young people. Clearly, there must have been offsetting developments in the adult labour market, and, as the table shows, this was more than fully represented by the growth in the employment of older females. Like young people, the employment of older males fell, although only by three per cent.

Most people, however, would probably show the keenest interest in developments over the most recent period and, as shown, 1971-1981 represented the only decade over which total employment actually declined. Once again the brunt of this was borne by young people and particularly by girls who had over 13 per cent fewer jobs at the end of the decade than they did at its outset. But the most striking feature is the fact that older females actually held more jobs at the terminal data year than they did ten years previously and had come to account for well over one-third of all persons in employment.⁽⁴⁾ This growth is, of course, well documented (Robinson and Wallace (1984), Joseph (1983), Elias (1980), Greenhalgh (1977)), although each treatment has a slightly different focus of attention. In the present case the major interest, especially in Section V, will be how much of this increase appears to have been at the expense of young people. But it is interesting to digress a little on the real, as opposed to nominal, impact on labour resource usage that this expansion of older females employment implies.

It is not possible to trace the number of females working part-time in the whole of Great Britain across the four censuses.

However, one can say that their number increased from 1,892,050 in 1961 to 3,543,329 in 1981; or from 25 to 39 per cent of all females in work. Equally, it has been found, using the Census of Employment, that between June 1971 and September 1981 the number of females engaged on a part-time basis rose from 2.8 to 3.8 million (Robinson and Wallace (1984), Table 1, p.4). The implication is, therefore, that the increase in female employment has not been as great in real terms as the nominal figures might seem to imply. However, without making very strong assumptions about hours of work, particularly when aggregate data is involved, it does not seem wise to venture firmer conclusions about the behaviour of full-time equivalent employment beyond the qualitative presumption that it has declined.

Clearly the trend towards increased part-time working also has important distributional consequences. In 1981, for instance, only 1.7% of young males, 2.7% of older males and 4.7% of younger females worked part-time compared to a remarkable 42% of older females. Nevertheless, such observations are the net result of complex interactions between numerous demand and supply forces; and from such broad-brush data one should not be tempted to infer that the outcome of the process has necessarily been to the detriment of younger workers. Indeed, some evidence emerges in Chapter 6 to the effect that youth labour is complementary to that of adult female part-timers. But this is forcing the pace too quickly and the next section goes on to consider in more detail the Census of Population employment statistics before the description of employment behaviour of age-sex groups is taken up again.

III. CENSUS OF POPULATION DATA

To examine employment patterns by age in the post-war period so as to incorporate developments beyond the early 1970's and to use only one single source of data, one is effectively constrained to utilise Census of Population data. For years beyond 1973 the EEC inspired Labour Force Survey (LFS) has become available on a regular basis but, (i) taken alone it does not constitute a true time-series and, (ii) it is only a sample and therefore one has a compatibility problem with sources of information like either the censuses of population or employment. Using the population census, one has available four full enumerations since 1951, reported in the Economic Activity tables, for the industrial distribution of employment by age and sex.⁽⁵⁾ From the data contained therein one is able to establish, for all counts and for the whole of Great Britain, the broad industrial distribution of youths aged less than 20 and adults aged 20 years and over.⁽⁶⁾

The principal problems encountered in looking at developments through time in industry disaggregated employment, whether this be by standard time-series regression analysis (which as already noted would only be possible up until 1972) or by the more discrete methods used here in Section V, are related to the changes in the Standard Industrial Classification (SIC) which have taken place over the period. Whilst no wholly satisfactory solution to the problem is available, one can at least form a set of reasonably consistent industry aggregates across the four census dates. These are given in Section V where they form the data base for analysis whilst further detail on their derivation is provided in the Appendix to the chapter.

But in addition to the commonplace data problems one should note also certain of the conceptual difficulties which arise in conducting exercises of the present kind. In the first place, even if the SIC had changed little through time and one had less of an aggregation problem than is the case here, it would still be true that the industries would not be defined in ways which appeal to the theoretician. Thus they are not based on close substitutability of outputs (Chamberlin (1933)) or in terms of goods' characteristics vectors (Chamberlin (1951), Lancaster (1966)). Rather they represent some mixture of history, inertia and present administrative convenience. Secondly, whilst it is tempting to adopt the language encountered in the labour market segmentation debates in an exercise such as the present, some restraint is called for. Thus, as argued above, the industries defined are highly aggregative and heterogeneous. Also, whilst the early works of Kerr (1954) and Doeringer and Piore (1971) have inspired much later research (eg Gordon (1972), Edwards et. al. (1975)) it remains an area in which quantification is difficult.⁽⁷⁾ In particular, it is certainly not clear that one should adopt industrial breakdowns of employment as is done here. Nevertheless, the industrial distribution of labour remains of interest as one possible way in which structural unemployment may come about, and the next section goes on to describe this for the four discrete years under study.

IV. EMPLOYMENT DISTRIBUTION BY AGE AND SEX 1951-1981

IV.i INTRODUCTION

This section will present, in turn, the static employment distributions derived from the four full censuses of population that

have taken place since 1951. As, for present purposes, each subsection will largely constitute a stand-alone, cross-sectional description by age and sex-group, with the bulk of the analysis contained in the following section, use can be made of the full industrial break-down for each year. However, to present these in their entirety would not only be cumbersome, it would also in many ways be unnecessary, owing to the heavy concentration of all groups in but a few industries. For expositional purposes, therefore, attention will initially be focussed on the five most important industries for each particular group in each year.

However, there is a certain amount of ambiguity surrounding the notion of importance in the present context. One way of interpreting it, and perhaps the most obvious, is to take the five industries which account for the largest percentages of each age-sex group in employment. If this is compared to the percentage of total employment accounted for by those industries then one gets one impression of the extent of employment concentration. However, the notion of importance might also be taken to relate to the percentage of each industry's employment accounted for by each age-sex group; that is, a factor intensity approach. If this information is then compared to the percentage of total employment accounted for by each age-sex group, then one can once again begin to draw some inferences about the extent of employment concentration. Therefore, the five leading industries in intensity terms will also be presented for each group in each year.⁽⁸⁾

But if one is looking at the question of whether young people are dispersed less evenly across the industrial network than their elders, and hence are possibly more susceptible to structural

unemployment, one can go a little further. Thus, measuring concentration has for long been a favoured pursuit of industrial economists. Whilst the focus of their attention has usually been on the proportion of an industry's assets held by individual firms, the general principles employed can be put to use in the current context also. But given no single measure has gained universal acceptance, four employment concentration statistics will be presented for each year, and these are now discussed in turn.

The first, CR_1 , simply gives the number of industries which account for 70 per cent of the total employment of each group, starting with the largest. In all cases this is not an integer value and the following, simple apportionment rule has been followed. If x_{ij} is the percentage of group i employed in industry j and

$$\sum_{j=1}^n x_{ij} = y_1 < 70$$

and

$$\sum_{j=1}^{n+1} x_{ij} = y_2 > 70$$

Then,

$$CR_{1i} = n + \frac{70 - y_1}{y_2 - y_1}$$

The second index of concentration, CR_2 , is closely related to the first and gives the percentage of each group employed by the five most important industries to them in employment terms.⁽⁹⁾ Both of these measures, however, are extremely simple and relate to only a point on the "concentration curve". As such, the information they convey can be sensitive to the precise cut-off chosen. Furthermore,

they are sensitive to the number of industries into which the economy is divided and are, therefore, not strictly comparable across SIC's.

A slightly more sophisticated way of examining employment concentration can be derived based on the Herfindahl index, although this too remains sensitive to the number of industries. In the first instance the basic statistic itself is defined as

$$H_j = \sum_{i=1}^n S_{ij}^2 \quad i = 1 \dots 4$$

where the squared proportion of each group i in industry j is summed across all n industries.⁽¹⁰⁾ However, as Adelman (1969) has pointed out, the Herfindahl can be translated into the number of equal-sized industries (in employment terms) that would give the same value of the index. This is the form of the measure that will be used here and, in the general case, for any exponent α , this is defined as

$$n_j(\alpha) = (\sum S_{ij}^\alpha)^{\frac{1}{1-\alpha}}$$

By using the popular value $\alpha = 2$, as here, this becomes simply the reciprocal of the original index, H .

Finally, a chi-squared statistic, χ^2 , will be presented for each year to ascertain whether the actual overall distribution of employment differs from that which one might expect. In this particular instance, the null hypothesis (or expectation), under the Laplace principle of insufficient reason, is that the

groups are distributed amongst industries in proportion to the importance of each jointly in overall employment. That is, the expected employment of group i in industry j is

$$E_{ij} = S_i S_j N$$

where S_i is the proportion of total employment accounted for by group i , S_j the proportion accounted for by industry j , and N represents total employment. The test statistic is then defined as

$$\chi^2 = \sum_{j=1}^m \sum_{i=1}^n \frac{(O_{ij} - E_{ij})^2}{E_{ij}}$$

where O represents observed values, E those expected and the subscripts are as above. As no population parameters are here being compared, the derived statistic has $(n - 1)(m - 1)$ degrees of freedom and can be evaluated at any chosen level of significance.⁽¹²⁾ This completes the detail which will be presented for each year and the employment distributions can now be examined in turn, beginning with the most historical.

IV. ii 1951⁽¹²⁾

Table 2 below presents the summary information on the five most important industries for the age-sex groups under study for the year 1951. Taking young males first, it can be seen that almost one-fifth of them were employed in public administration and defence. This, however, is perhaps a rather misleading statistic caused by the continuation of national service conscription until 1960. Thus as

TABLE 2
EMPLOYMENT DISTRIBUTION 1951

MALES < 20			MALES ≥ 20			FEMALES < 20			FEMALES ≥ 20		
% OF BOYS	IND. % OF TOT. EMP.	INDUSTRY	% OF MEN	INDUSTRY	IND. % OF TOT. EMP.	% OF GIRLS	INDUSTRY	IND. % OF TOT. EMP.	% OF WOMEN	INDUSTRY	IND. % OF TOT. EMP.
19.7	7.7	Public Administration & Defence	10.2	Transport & Communication	7.7	21.9	Distributive Trades	12.1	21.8	Miscellaneous Services	10.3
11.1	6.3	Building & Contracting	10.1	Distributive Trades	12.1	11.2	Miscellaneous Services	10.3	15.8	Distributive Trades	12.1
8.9	8.0	Engineering, Shipbuilding & Electrical Goods	9.3	Engineering, Shipbuilding & Electrical Goods	8.0	10.3	Clothing	3.2	14.1	Professional Services	6.9
8.6	12.1	Distributive Trades	8.6	Building & Contracting	6.3	9.0	Textiles	4.5	7.8	Textiles	4.5
8.6	5.1	Agriculture, Forestry & Fishing	8.4	Public Administration & Defence	7.7	8.2	Professional Services	6.9	6.3	Clothing & Footwear	3.2

Source : Census of Population 1951 : Economic Activity Tables

TABLE 2 (continued)

MALES < 20		MALES ≥ 20		FEMALES < 20		FEMALES ≥ 20	
% OF IND.	INDUSTRY	% OF IND.	INDUSTRY	% OF IND.	INDUSTRY	% OF IND.	INDUSTRY
14.3	Public Administration & Defence	91.9	Mining & Quarrying	17.3	Clothing	53.7	Miscellaneous Services
12.1	Manufactures of Wood & Cork	87.2	Gas, Electricity & Water	11.0	Textiles	52.2	Professional Services
9.9	Building & Contracting	87.2	Building & Contracting	10.4	Paper & Printing	49.6	Clothing
9.5	Agriculture, Forestry & Fishing	84.2	Metal Manufacture	9.8	Distributive Trades	44.6	Textiles
7.1	Precision Instruments, Jewellery etc	84.0	Transport & Communication	9.3	Insurance, Banking & Finance	33.3	Distributive Trades
5.6	TOTAL	63.6	TOTAL	5.4	TOTAL	25.4	TOTAL

Source : Census of Population 1951 : Economic Activity Tables

will be seen, in no other year did the industry defined to include defence employ more than 9 per cent of young men. But, what might now be considered as rather remarkable is the fact that the labour market seemed to have been readily able to absorb those who would in earlier times have been conscriptees. Construction was the second largest absolute employer of boys, accounting for 11 per cent of those in work, which approached almost twice the importance of the industry to the labour force as a whole. The combined engineering industries accounted for about 9 per cent of young men, which is in line with their overall labour market share. However male youths were heavily under-represented in the distributive trades, even though this sector accounted for more than 1 in 12 of all young male employees. Lastly, one can see the early importance of agriculture to young males, a sector well known to have declined in importance in the labour market through time.

In some ways it is most interesting to compare the position of youths in the industrial structure with those of their adult counterparts of the same sex. Looking at the data in the first half of Table 2 it can be seen that the picture for adult males was broadly similar to that for younger men; save for the importance of defence to the latter group, as discussed above, and the importance of transport to the former. This is interesting because this latter sector is one within which legislative restrictions are often seen as an influence mitigating against the employment of young people (e.g. age restrictions on the ability to hold various kinds of driving licence).

Looking at the 1951 position of young females in the employment distribution, it is immediately apparent that they were grossly over-represented, and heavily employed in absolute terms, in just three industries. These were the distributive trades and the clothing and the textile industries. The former in fact employed more than 1 in 5 of all girls in work, whilst the second mentioned was over three times as important for young females as it was for the workforce as a whole. Miscellaneous and professional services were the other important sectors for young women and between them employed 20 per cent of their number in work. Whilst the order of the industries differed in the hierarchy, the position for older women was broadly similar to that described above - except that in this case the heaviest over-representation occurred in the miscellaneous and the professional services - and therefore attention will now be turned to the factor intensity details given in the second half of Table 2.

Looking at this information, one sees clearly that relative specialization in any labour factor is not sufficient for an industry to be responsible for a large proportion of that factor in employment (or vice-versa). Thus wood and cork manufacturing and precision instruments both specialised, in relative terms, in male youth labour whilst not being heavy absolute employers. With the exception of construction, the situation for adult males was strikingly different from that which obtained for young men. Given the former accounted for around 90 per cent of all employees in mining and the power supply industries the initial impression, although much more evidence is required, is that of recruitment policies in certain sectors which, at least in effect, discriminate against younger males. (13)

Once again the picture for females was more clear-cut than that for males, in spite of the fact that one expects considerable wastage from the labour force of adult women. Thus three industries were common to those in the top five female intensive for each group, with the most notable exception being miscellaneous services which was over twice as adult women intensive as the workforce as a whole.⁽¹⁴⁾ The initial impression is that this was a reflection of part-time working patterns in this sector; but, as suggested at various other points of the present study, this is a phenomenon which awaits a convincing economic rationalisation. Further, however, with this first snap-shot showing the pattern of older females' employment to be much more nearly like that of girls than boys, it might initially be hypothesised that increases in older womens' participation should have more serious impacts upon the employment prospects of the former. However, in truth, this denies the possibility of complementarity in production - whether this be strictly economic, or quasi-institutional (as might be argued to be the case with certain journeyman-apprentice employment ratios).

Having got some impressionistic evidence from the upper echelons of the employment distributions that the employment patterns of the four groups exhibited noticeable differences in 1951, and therefore that declines in various industries at that time might have had differential impacts upon them, further light can be shed on the issue by looking at the four concentration measures described above. These are given in Table 3, and some interesting features emerge. Thus no group was as widely dispersed throughout the industrial hierarchy as was the workforce as a whole (CR_1) wherein 9.6

industries accounted for 70 per cent of total employment. On this measure young people fell between the extremes provided by adult males at the upper end (9.3 industries) and adult females at the most concentrated, lower end (5.9). On looking at the percentage of each

TABLE 3

1951 : MEASURES OF EMPLOYMENT CONCENTRATION

	MALES <20	MALES >20	FEMALES <20	FEMALES >20	TOTAL
CR ₁	7.6	9.3	6.8	5.9	9.6
CR ₂	57.0	46.6	60.2	65.6	44.6
n(H)	11.5	15.5	10.1	8.9	15.4
χ^2	5,311,098				

group employed in the five biggest users of that labour type in absolute terms (CR₂) a more or less a mirror image emerges. Thus these account for fewer employees in total than they do for any group alone, and the individual orderings reflect that for CR₁. On turning to the numbers equivalent Herfindahl (n(H)), which takes account of all industries defined, a similar ranking emerges, except that adult males are marginally more dispersed than is the workforce as a whole. However, whilst there is no test statistic available, young workers appear to have a skewed employment distribution much more akin to that of older women than men. Finally, as will be seen for all years, the χ^2 is enormously significant and indicative of a highly

non-random employment distribution. But, of course, the measure itself provides no further insight. The question now to be answered is whether the same sorts of patterns as those which pertained in 1951 continued through the remaining census points.

IV. iii 1961

Between the 1951 and 1961 censuses the SIC in use was changed from the 1948 to the 1958 classification. However, whilst the orders changed (herein the industries or sectors) their number remained constant at 24. The material to be presented is the same as in the previous sub-section, and the upper half of Table 4 gives the largest employers, in absolute terms, of each of the four groups. Looking first at young males one sees that whilst public administration and defence remained important to them, the ending of conscription meant that this was only slightly more so than for the population as a whole. Also, in line with its overall decline in importance, agriculture was no longer one of the most important employers of young males. Further, of the first four employing industries in the hierarchy, abstracting from any definitional changes, all had considerably increased their importance to the group. But note now, however, that whilst boys were again heavily dependent upon the distributive trades, they were not significantly under-represented therein compared to the labour force as a whole, which was in marked contrast to the situation in 1951. When the position of boys is compared to that which prevailed for older males in 1961, one can see that they had drawn much closer to each other than was the case earlier. The only real exceptions to this being that transport and communication remained very important for adults whilst miscellaneous services figured highly for youths.

TABLE 4
EMPLOYMENT DISTRIBUTION 1961

-MALES < 20			MALES ≥ 20			FEMALES < 20			FEMALES ≥ 20		
% OF BOYS	INDUSTRY	IND. % OF TOT. EMP.	% OF MEN	INDUSTRY	IND. % OF TOT. EMP.	% OF GIRLS	INDUSTRY	IND. % OF TOT. EMP.	% OF WOMEN	INDUSTRY	IND. % OF TOT. EMP.
13.4	Distributive Trades	13.7	10.4	Distributive Trades	13.7	24.1	Distributive Trades	13.7	19.0	Distributive Trades	13.7
12.9	Construction	6.9	9.6	Transport & Communication	7.2	12.5	Miscellaneous Services	9.9	18.5	Professional & Scientific Services	9.1
10.7	Engineering & Electrical Goods	8.7	9.5	Engineering & Electrical Goods	8.7	8.4	Professional & Scientific Services	9.1	17.0	Miscellaneous Services	9.9
8.4	Miscellaneous Services	9.9	9.4	Construction	6.9	7.6	Clothing & Footwear	2.3	6.7	Engineering & Electrical Goods	8.7
6.5	Public Administration & Defence	6.1	7.3	Public Administration & Defence	6.1	7.4	Engineering & Electrical Goods	8.7	5.5	Textiles	3.4

Source : Census of Population 1961 : Economic Activity Tables

TABLE 4 (continued)

MALES < 20		MALES ≥ 20		FEMALES < 20		FEMALES ≥ 20	
% OF IND.	INDUSTRY	% OF IND.	INDUSTRY	% OF IND.	INDUSTRY	% OF IND.	INDUSTRY
11.7	Timber, Furniture etc	90.9	Mining & Quarrying	17.0	Clothing & Footwear	55.6	Professional & Scientific Services
10.7	Construction	85.5	Shipbuilding & Marine Engineering	12.5	Insurance, Banking & Finance	55.3	Clothing & Footwear
9.8	Shipbuilding & Marine Engineering	85.1	Construction	9.6	Textiles	46.8	Miscellaneous Services
9.2	Agriculture, Forestry & Fishing	85.0	Gas, Electricity & Water	9.3	Distributive Trades	44.3	Textiles
7.2	Metal Goods n.e.s.	82.5	Transport & Communication	8.2	Paper, Printing & Publishing	38.0	Distributive Trades
5.7	TOTAL	61.8	TOTAL	5.3	TOTAL	27.3	TOTAL

Source : Census of Population 1961 : Economic Activity Tables

In 1961 virtually one quarter of all young females in work were employed in the distributive trades. A further one in eight were in miscellaneous services and one in twelve in professional and scientific services. However, amongst the industries which were most important to them, they were most heavily over-represented in the clothing and footwear industries. Of the five most important employers of young females, four appeared in the equivalent list for adult women. Whilst the distributive trades alone were not as significant in the latter case, jointly the first three industries (all in the service sector) were and together accounted for over half the number in work.

Looking at each groups intensity within particular industries, one sees that for young males only two remained in the top five in 1961 from the equivalent list for 1951. Whilst there are aggregation problems, SIC changes and the ending of conscription to remember, this does at least give an initial impression that some flexibility does exist in factor usage. In 1961 young men were slightly more important in the labour force than in 1951, but the extremes of their intensity within individual industries seemed, if anything, to have been slightly attenuated. However, the position of boys within agriculture and construction merit further comment. Thus the labour force in the former declined by almost one quarter over the preceding decade and yet the importance of young males within it remained largely stable. Using simple human capital or institutional last in, first out reasoning (which can, of course, be given an economic interpretation) this seems a surprising result. But, on the other hand, it might provide one counter-example for those who worry

that young people have the most to fear from sectoral declines. However, the construction industry is both cyclically and seasonally sensitive and it would be interesting to know how youths fared through such vicissitudes.

Turning to the statistics for adult males one sees confirmation of their declining importance in the labour market as a whole. However, they still utterly dominated at least five industries. Of these, only two, construction and shipbuilding, were amongst the most intensive employers of young males. The former has already been discussed, but one might note that the latter has been faced with long-term secular decline. Given that this industry is separately identified again in 1971 it will be interesting to compare later developments therein with the case of agriculture noted above.

On looking at the situation for young females one can see that, whilst the ordering changed, the top five industries remained essentially unchanged over the decade. The same is also true of adult females and therefore the remarks made for the earlier year apply here as well. But it is perhaps interesting to note how the relative specialisation of insurance, banking and finance and the professional and scientific services for young and adult females respectively hardened, without this affecting the other group in either case.

Formalising the impressionistic picture slightly, Table 5 gives the concentration statistics derived from the 1961 census returns. Taking CR_1 first, all groups except young males had a more concentrated employment distribution in 1961 than was the case a decade earlier. In the case of the latter it took 9.2 industries to employ 70 per cent of their total in work. Furthermore, on this criterion, this made them the least concentrated group; having

TABLE 5

1961 : MEASURES OF EMPLOYMENT CONCENTRATION

	MALES <20	MALES 20+	FEMALES <20	FEMALES 20+	TOTAL
CR ₁	9.2	8.5	6.7	5.7	9.1
CR ₂	51.9	46.2	60.0	66.7	49.4
n(H)	13.8	15.7	9.4	8.7	14.2
χ^2	4,839,877				

exchanged places with adult males. However, when one looks at the percentage of employment accounted for by only the five most important industries, CR₂, the 1951 concentration hierarchy remains unchanged; a fact which most of all demonstrates the potential ambiguity in such simple measures. Nevertheless, the figure for young males was much closer to that recorded for their adult counterparts. One might note further that, under this measure, all groups appear less concentrated in 1961, except for older females, which again provides something of a contrast with the CR₁ results.

Turning to the numbers equivalent Herfindahl, n(H), the results support those obtained from the five industry CR₂ measure.⁽¹⁵⁾ Thus, the concentration ordering is the same, and boys appear more nearly distributed in the same way as men. Young females became less widely dispersed over the decade, and moved closer to the extreme provided by older women. As far as the labour force as a whole is concerned, however, all these measures indicate that it became more

concentrated, at least in terms of SIC orders, over the ten year period 1951-1961. Lastly, the chi-square statistic once again shows that the overall employment distribution was distinctly not random. But more interest might be shown in the census returns for 1971, to which attention is now turned, in as much as this was the first enumeration at which the aggregate employment of all groups, except older women, had fallen.

IV. iv 1971

Table 6 below gives the employment distributions for 1971. This enumeration utilised the 1968 SIC, which had 27 orders, and so was not strictly comparable to the earlier classifications reported above. However, the principal definitional changes that took place were within the manufacturing sector and, with most workers of all ages and sex located elsewhere in the economy, this does little damage to the comparisons at the upper end of the hierarchy. With this in mind, the list of the most important employers of young males had a very similar appearance to that of a decade earlier. With the exception that no engineering industry figured in the five most important employers of older males, much the same was true in their case. The development which accounted for the foregoing change was the emergence of the professional and scientific services as a significant user of their labour in absolute terms. However, this was largely a reflection of the growth of this sector and the importance of older males in the labour force as a whole. As a manifestation of this one can see that they were heavily under-represented there in spite of the absolute number employed.

TABLE 6 EMPLOYMENT DISTRIBUTION 1971

MALES < 20			MALES ≥ 20			FEMALES < 20			FEMALES ≥ 20		
% OF BOYS	IND. % OF TOT. EMP.	INDUSTRY	% OF MEN	INDUSTRY	IND. % OF TOT. EMP.	% OF GIRLS	INDUSTRY	IND. % OF TOT. EMP.	% OF WOMEN	INDUSTRY	IND. % OF TOT. EMP.
13.1	12.7	Distributive Trades	10.3	Construction	7.0	21.8	Distributive Trades	12.7	22.7	Professional & Scientific Services	12.2
12.1	7.0	Construction	9.4	Distributive Trades	12.7	11.8	Miscellaneous Services	9.9	17.5	Distributive Trades	12.7
9.9	9.9	Miscellaneous Services	8.9	Transport & Communication	6.6	10.2	Professional & Scientific Services	12.2	15.2	Miscellaneous Services	9.9
7.3	4.7	Mechanical Engineering	7.5	Public Administration & Defence	6.6	10.0	Insurance, Banking, Finance & Business Services	4.0	5.3	Public Administration & Defence	6.6
6.9	6.6	Public Administration & Defence	7.2	Professional & Scientific Services	12.2	7.1	Clothing & Footwear	2.0	4.9	Insurance, Banking, Finance & Business Services	4.0

Source : Census of Population 1971 : Economic Activity Tables

TABLE 6 (continued)

MALES < 20		MALES ≥ 20		FEMALES < 20		FEMALES ≥ 20	
% OF IND.	INDUSTRY	% OF IND.	INDUSTRY	% OF IND.	INDUSTRY	% OF IND.	INDUSTRY
9.8	Timber, Furniture etc	90.5	Mining & Quarrying	14.2	Clothing & Footwear	60.8	Professional & Scientific Services
8.4	Shipbuilding & Marine Engineering	86.5	Construction	9.9	Insurance, Banking, Finance & Business Services	59.1	Clothing & Footwear
7.7	Construction	85.5	Shipbuilding & Marine Engineering	6.8	Distributive Trades	50.0	Miscellaneous Services
6.8	Mechanical Engineering	84.7	Coal & Petroleum Products	6.4	Textiles	45.0	Distributive Trades
6.6	Metal Goods n.e.s.	82.3	Metal Manufacture	5.4	Leather, Leather Goods & Fur	40.3	Insurance, Banking, Finance & Business Services
4.5	TOTAL	58.9	TOTAL	4.0	TOTAL	32.7	TOTAL

Source : Census of Population 1971 : Economic Activity Services

To a certain extent, a similar picture emerged for young females with the only ostensible change being that insurance etc. replaced engineering in the upper echelons of the employment distribution. However, there is some suggestion that their position in the distributive trades and miscellaneous services softened to bring them more into line with their older contemporaries. But, on the other hand, it is noteworthy that whilst the percentage of young females engaged in the professional and scientific services increased it did so by less than the sector itself grew, although their relative loss was not as great as that of older women. Thus overall, the general impression is that the employment distributions had tended to more closely resemble each other - notwithstanding the continued massive over-representation of girls in the clothing industry.

As in the work for previous years, the lower half of Table 6 provides information on the most intensive users of the labour of each group. For young males the picture appeared similar to that pertaining a decade earlier. However, except for metal goods and mechanical engineering (which replaced agriculture in the hierarchy) specialisation in their labour apparently diminished somewhat, although this must be placed in the context of their diminished share of the overall labour force. It will be recalled that the continued heavy presence of young men in a declining agricultural workforce earlier elicited comment. Between 1961 and 1971 the industry declined a further 25 per cent in employment, but this time the movement in the share of young males in the total was rather more in accord with a priori expectations. Thus their share of employment within the industry declined by some 30 per cent and meant that

agriculture no longer figured amongst the leading boy intensive sectors. Examining briefly the figures for adult males one can see that whilst their share of the aggregate labour force had declined once again, they still continued to dominate certain industries. The five identified in the table were the same as those appearing in 1961 and, in particular, they maintained their share of shipbuilding employment which declined by 24 per cent in total. However, one might actually have expected their intensity within that sector to have increased. Finally, there continued to be marked differences in the identities of the industries specialising relatively heavily in adult men and those so doing in their younger counterparts.

Looking at the figures for females, and comparing them with those from a decade earlier, one quickly sees the sharply divergent behaviour of the overall employment of the two groups. Thus older females significantly increased their share of the total whilst there was a marked decline in that accounted for by girls. As one would expect, this latter fall was matched by a corresponding reduction in the upper extremes of the specialisation figures. However, in spite of this, those concerned with structural unemployment issues might note with some concern the continued heavy representation of young females in the declining clothing, footwear and textile industries. Older females, on the other hand, experienced an increase in their representation in most industries, in line with their increased total share of employment. The exception to this was the declining textile industry and one might be tempted to rationalise this in much the same way as the expectation that youths will be "first out" in this situation.⁽¹⁶⁾ Bearing in mind the fact that the number of industries had grown in 1971, the upshot of the foregoing in terms of concentration ratios is now examined.

These are presented in Table 7 and, apart from the equality between the CR_1 statistics for the two male groups, all relate basically the same story. This is that adult females continued to have the most concentrated employment distribution, followed by younger females, younger males and lastly adult men whose pattern of employment was again the most widely dispersed. Once more the statistics were closer by sex than they were by age. A seemingly robust development over the observations for ten years

TABLE 7

1971 : MEASURES OF EMPLOYMENT CONCENTRATION

	MALES <20	MALES >20	FEMALES <20	FEMALES >20	TOTAL
CR_1	10.6	10.6	7.1	6.2	10.1
CR_2	49.3	43.3	60.9	65.8	54.0
n(H)	15.3	17.0	10.2	8.5	15.0
χ^2	4,340,986				

earlier, although one which may of course be due simply to the SIC changes, was that both young and older males had an employment distribution that was wider than that of the labour force as a whole. Combined with the observations for females one might, at this stage, have taken this as some evidence that young men should not be unduly sensitive to cyclical downturns. But this ignores the differing industrial locations of the various groups and the fact that, in

general, industries are not equally sensitive to the cycle. What the actual outcome of the crisis torn 1970's was on the distribution of employment is therefore the issue to which attention is now turned.

IV.v 1981⁽¹⁷⁾

When looking at the distribution of employment in 1981 one is faced with a very real problem of data consistency when making historical comparisons. Thus the 1980 SIC moved from the old Order system to a classification based on 60 Classes. Whilst it is possible, by aggregation, to introduce a broad conformity, as will be undertaken in the next section, for the purposes of the current work this will not be done, and the caveat should be borne in mind. However, in general one is forced to look at more narrowly defined industries when the full classification is made use of, and this has certain compensating advantages.

Looking first at the top half of Table 8, the five largest employing classes are presented for each group. Young males were the only group in 1981 who were over-represented in each of these compared to the share of the total labour force for which the industries accounted. The largest four for them bore a striking resemblance to those which were important in previous years, whilst the fifth - motor repairs - was previously an element of miscellaneous services.⁽¹⁸⁾ These final observations prompt the conclusion that, throughout the post-war period, young males have been heavily concentrated in the construction industry. Purely from a structuralist stand-point this leads one to expect that the group would face periodic unemployment problems. Furthermore, these forces

TABLE 8
EMPLOYMENT DISTRIBUTION 1981

-MALES < 20			MALES ≥ 20			FEMALES < 20			FEMALES ≥ 20		
% OF BOYS	INDUSTRY	IND. % OF TOT. EMP.	% OF MEN	INDUSTRY	IND. % OF TOT. EMP.	% OF GIRLS	INDUSTRY	IND. % OF TOT. EMP.	% OF WOMEN	INDUSTRY	IND. % OF TOT. EMP.
14.0	Construction	7.0	10.5	Construction	7.0	20.3	Retail Distribution	9.8	14.0	Retail Distribution	9.8
11.1	Retail Distribution	9.8	7.0	Public Adm., National Insur. & Compulsory Social Security	7.0	7.5	Medical and Other Health Services, Veterinary Services	5.4	11.1	Banking & Finance	6.3
8.9	Public Adm., National Insur. & Compulsory Social Security	7.0	6.3	Retail Distribution	9.8	6.9	Banking & Finance	2.1	10.8	Medical & Other Health Services; Veterinary Services	5.4
5.5	Mechanical Engineering	3.9	5.5	Mechanical Engineering	5.5	6.7	Public Adm., National Insur. & Compulsory Social Security	7.0	7.2	Hotel & Catering	4.1
4.5	Repair of Consumer Goods & Vehicles	1.5	4.9	Business Services	3.9	5.0	Business Services	5.0	6.8	Public Adm., National Insur. & Compulsory Social Security	7.0

Source : Census of Population 1981 : Economic Activity Tables

TABLE 8 (continued)

MALES < 20		MALES ≥ 20		FEMALES < 20		FEMALES ≥ 20	
% OF IND.	INDUSTRY	% OF IND.	INDUSTRY	% OF IND.	INDUSTRY	% OF IND.	INDUSTRY
13.0	Repair of Consumer Goods & Vehicles	95.6	Chemical Industry	16.1	Personal Services	85.8	Domestic Services
9.1	Forestry	89.8	Coke Ovens	11.8	Banking & Finance	72.5	Medical and Other Health Services; Veterinary Services
8.9	Timber & Wooden Furniture Industries	89.6	Coal Extraction & Manufacture of Solid Fuels	10.6	Footwear & Clothing Industries	71.9	Other Services Provided to the General Public
8.5	Fishing	89.1	Extraction & Preparation of Metalliferous Ores	7.8	Insurance, except for Compulsory Social Security	64.8	Education
8.2	Construction	88.1	Railways	7.3	Retail Distribution	64.7	Hotels & Catering
4.1	TOTAL	55.9	TOTAL	3.6	TOTAL	36.4	TOTAL

Source : Census of Population 1981 : Economic Activity Tables

may not come about simply from the economic cycle; there may also be a political element to the problem, given that the local authorities are responsible for the generation of a significant amount of construction work. But this latter is admittedly a conjectural hypothesis. On the other hand, public administration would normally be regarded as a sector affording considerable employment stability to those workers who wished, and were able, to take advantage of it and this has also been found to be a consistently large employer of young males.

On turning to the employment distribution of older males, one can see that, even with the finer SIC in operation, the picture resembled reasonably closely that obtaining for boys. The principal difference is that nowhere are the former as over-represented compared to their weight in the labour force as a whole, as are the latter, although this necessarily follows given the size of the adult male workforce. An interesting feature of the findings is that retail distribution, a sector most would associate with female employees, is, by virtue of its very size, important in the labour market for older men. Indeed, it ranked in the top three largest employers for all four groups here identified.

The most important employers of both younger and older females were all in the service sector.⁽¹⁹⁾ For each, the largest of these was the retail distribution industry, which employed one in five girls and one in seven women. But it seems important to note the marked differences in the distributions of male and female workers. Those for males had within them a preponderance of industries which might be regarded as cyclically sensitive. However, those for females would, at least at first sight, appear to belie structural

explanations of the recent surge in unemployment, although this is a largely impressionistic response to very aggregate data.

Looking at the second half of Table 8, one gets immediate confirmation of the findings earlier in the chapter. That is, the share of older females in the employed population increased over the preceding decade whilst that of others fell. But, with the finer industrial breakdown under the 1980 SIC, one can further see that certain areas of the economy continued to specialise heavily in each group of worker. In the case of young males this amounted to the industries in which they were most intensely represented employing between two and three times as many of them as the economy wide average. The largest of these, consumer goods and motor vehicle repairs, one imagines to be populated by, in the main, small firms and prompts the observation that we still do not know enough about youth employment and firm size. On top of this it can be noted that none of the leading employing industries are common for men and boys, which further suggests a greater knowledge of the employment transition process from youth to adult is required. Also, in spite of their reduced share of the labour force, older males can clearly be seen to still utterly dominate certain areas of the economy and a more thorough investigation of why this is so would be desirable.

The same divergent picture also emerged in the labour market for females. Whilst the institutions of marriage and part-time working might in this case provide a partial explanation, none of the arguments popularly advanced are altogether convincing. For instance, one might ask why females do not appear, at least on the present evidence, to return to those areas where they initially found

employment? Also, why is part-time work so much more important in some sectors than others, and why do not the jobless young appear to compete for it? But whilst these are issues suggested by the present data, they cannot adequately be researched and explained by it and therefore to complete this initial summary of the distribution of employment by age and sex the measures of concentration for 1981, given in Table 9, are now examined.

Taking the number of industries which accounted for 70 per cent of each group in employment, CR_1 , young males can be seen to fall in between the extremes provided by the two female categories and older men. Further, there was a reversion to the patterns of 1951 and 1961

TABLE 9

1981 : MEASURES OF EMPLOYMENT CONCENTRATION

	MALES <20	MALES >20	FEMALES <20	FEMALES >20	TOTAL
CR_1	14.5	18.0	11.3	11.1	17.1
CR_2	44.0	34.2	46.4	49.9	35.5
n(H)	18.0	25.4	14.0	15.6	24.9
χ^2	5,445,514				

with only the latter group being more widely dispersed than the labour force as a whole. A similar picture emerges when the share of each groups employment accounted for by the five most important industries to them, CR_2 , is considered - except that male youths more nearly approach the degree of concentration of females. The numbers

equivalent Herfindahl, $n(H)$, which takes account of all industries, seems to add weight to the finding that, in 1981, young females displayed the most concentrated employment pattern. However, this concentration was not much greater than that of older women, although their overall employment fortunes have differed markedly through time. Clearly more information is required, and the next section attempts to analyse the temporal employment movements which have occurred in a way which gives further insights into the possibility that important structural forces have been at work.

V. SHIFT-SHARE ANALYSIS

V.i INTRODUCTION

It is probably fair to say that the employment of young workers has received somewhat less attention than has their unemployment. Furthermore, on examining the analyses of the former which have been undertaken to date one quickly becomes aware of contradictions between the findings of different researchers. Thus, Hutchinson et al. (1984, p.196) state that "the strongly significant positive coefficient on the ratio of young to adult male wages gives support to the view that young and adult male labour are complementary inputs" whilst Wells (1983, p.48) states that "There was a strong negative relationship in all the formulations between the labour costs of young people relative to adult males and their (relative) employment" and "...young males under 18 were found to be substitutes for all other age/sex groups (there were negative relationships between employment and relative earnings for adult males.....)" (parentheses in original). Both of these findings are based on the application of regression analysis to data on the employment of young

people through time and it would appear both useful and interesting to apply a somewhat different methodology to the problem, given the conflicting results that have previously been generated.

In the present instance the aim will be to attempt to isolate the components of industrial employment change across census years by a variant of shift-share analysis. Not only will this allow an examination of several disaggregated sectors simultaneously, it will also prove possible to compare the performance of youths with adults. In particular, it will allow a little more to be said about the hypothesised substitution of adult female for youth labour through time.⁽²⁰⁾ The technique employed has been used by, amongst others, Bonnell (1982) and Bonnell and Dixon (1982) in an employment context and by Tzannatos and Zabalza (1983) to investigate components of earnings change. Within this framework, the employment of the i^{th} group in the labour force at time t (E_i^t) can be expressed as

$$(1) \quad E_i^t = \sum_{j=1}^J S_{ij}^t Q_j^t N^t \quad (i = 1 \dots 4)$$

where J is the number of industries, S_{ij}^t is i 's share of the employment in industry j at t , Q_j^t is the proportion of total employment accounted for by j at t and N^t is total employment at t .

From equation (1) the change in employment of the i^{th} group (ΔE_i) across any time period $t_1 - t_0$ can be shown to be

$$(2) \quad \Delta E_i = P_i + W_i + G_i + R_i$$

where P_i could be labelled the share effect and is given by

$$(3) \quad P_i = \sum_{j=1}^J \bar{Q}_j \bar{N} (S_{ij}^1 - S_{ij}^0)$$

W_i might be termed the structural change effect and is measured as

$$(4) \quad W_i = \sum_{j=1}^J \bar{S}_{ij} \bar{N} (Q_j^1 - Q_j^0)$$

and G_i represents an overall employment growth effect given by

$$(5) \quad G_i = \sum_{j=1}^J \bar{S}_{ij} \bar{Q}_j (N^1 - N^0)$$

Finally, R_i is a residual term which may be ignored as insignificant, it being the product of three changes,

$$(6) \quad R_i = \sum_{j=1}^J (S_{ij}^1 - S_{ij}^0) (Q_j^1 - Q_j^0) (N^1 - N^0) \quad (21)$$

In the above, the superscripts represent the two chosen (census) dates for analysis and the bars denote mean values of the variable in question; for instance

$$\bar{Q}_j = \frac{Q_j^1 + Q_j^0}{2}$$

This technique simply states that when the employment change of any one group (ΔE_i) is not in direct proportion to the change in aggregate employment ($N^1 - N^0$) then the difference can conceptually be broken down into two components:

- (1) that due to the change in that group's share of each particular industry's employment ($S_{ij}^1 - S_{ij}^0$)
- (2) that due to changes in overall distribution of total employment, i.e. in the importance of individual industries ($Q_j^1 - Q_j^0$) within which group i is employed.

It is obviously attractive to interpret the share effect as being analogous to the substitution effect of microeconomic theory wherein a ceteris paribus increase in the relative price of any one factor will lead to a reduction in its employment. If such an analogy is to be "strict", however, it should be noted that the production functions would be required to be homothetic (factor price constant output changes occur along a ray in factor space) and the quality of all inputs would be required to change at the same rate.⁽²²⁾ Whilst accepting that such restrictions are unlikely to hold, each individual section commences with a recapitulation of the results for relative wage movements in the time period concerned, as depicted in the last chapter.⁽²³⁾ But, even if one is unable to accept such an interpretation, the methodology retains interest as a useful ex-post way of disaggregating employment change, particularly in the context of youths whose employment has received much less attention than their unemployment.

In the aggregate, of course, such substitution effects may be either masked or reinforced by any structural changes or general growth effects, which have taken place through time. This, for instance, may offer a partial explanation as to why the employment of females has grown (as detailed in Joseph (1983)) in spite of the Equal Opportunity (1970) and Equal Pay (1975) Acts which most commentators agree will have served to increase the price of their labour. Interestingly, Bonnell (1982) found that structural changes between 1971 and 1976 in the Australian labour market had re-inforced a perverse share effect for females. Equally, one might ask, and within the current framework gain some insight into, whether some alleged relative wage induced effects on youths in employment may not more properly be seen as a reflection of their relatively heavy concentration in declining sectors.⁽²⁴⁾

Shift-share, or components of change, analysis has, of course, led a chequered life in the literature. The weight of the criticisms levelled at it depend very much on what is being expected of any particular application. Its sternest critic is probably Richardson (1978) who argues for the abandonment of the "primitive technique", whilst its most spirited defence is likely that of Fothergill and Gudgin (1979). Given, however, that the literature is so comprehensive (a detailed bibliography may be found in Danson et. al. (1980)), only a short review of the most salient issues will be undertaken here.

The aim of the exercise is to use a variant of the relatively simple standardisation technique which has found favour, and success, in other areas of investigation to shed further light on historical developments within the British labour market which, to date, have

attracted differing interpretations.⁽²⁵⁾ It is to be stressed, however, that it is not the current aim to use the results for forecasting purposes; which would only be possible, if at all, in conjunction with other techniques, as Stilwell (1970) argued.

Further, as Mackay (1968) points out, the components of change are often likely to be interdependent. In the current instance, for example, a wage change of a group within an industrial sector which affects its share of employment therein may also affect the fortunes of that sector through relative cost effects. To meet this criticism, one might argue, as Stilwell (1970), that estimated share effects represent a minimum magnitude of the effect of, for example, relative wage changes. However, it should be noted that the analysis is conducted as though the market was demand constrained throughout the period although, of course, supply effects may well have impinged, at the very least through the average growth effect. However, this is a characteristic shared by many of the conventional analyses in this area such as Hutchinson et al. (1984).

Finally, the existence of the aggregation problem cannot be ignored, which was one of Richardson's (1978) major criticisms of the shift-share technique. A finer disaggregation than that to be used here, to be discussed further below, would clearly be desirable. But even without the changes which have occurred to bedevil this, it must be noted that, as argued previously, the SIC is not constructed on defensible economic criteria and some degree of internal heterogeneity remains inevitable. But this criticism notwithstanding, it is reassuring to note that the findings of Fothergill and Gudgin (1979) were relatively insensitive to disaggregation at the SIC Order or MLH

level. However, more consideration must now be afforded to the sectoral definitions to be used below, as made necessary by the SIC changes over time.

V.ii SECTOR DEFINITIONS

For the analyses using the data for 1951-1971 inclusive it is possible to identify 11 industries or sectors common across SIC's. As the changes which took place over this time involved internal adjustments within the manufacturing sector this simply entails aggregating the individual industries therein. All other industries remain the same with the exception of the transfer of garage repairs from vehicles to miscellaneous services in 1951, as noted in the Appendix to the chapter.

The manipulations needed to perform the analysis for 1971-1981 are somewhat less satisfactory than those above. However, the paucity of data, and consequently work done, on youth employment in this decade provides at least partial justification for the procedures adopted. Given the radical changes made to the SIC in 1980 it is only possible to identify 7 broad sectors across 1971 and 1981 with any degree of exactitude. These are detailed in Table 10 where the sectors are defined in terms of the 1971 SIC nomenclature. Even this, however, is not possible with published data and recourse had to be made to unpublished data tables, provided by the office of Population Censuses and Surveys, on employment by age and sex disaggregated to Activity level. Nevertheless, certain, minor irreconcilable differences remain between the classifications and the adjustments made in the light of them are detailed in the Appendix.

TABLE 10 : SECTOR SPLIT FOR 1971-1981

I	AGRICULTURE FORESTRY AND FISHING
II	MINING AND QUARRYING
III	MANUFACTURING INDUSTRY
IV	CONSTRUCTION
V	GAS, ELECTRICITY AND WATER
VI	TRANSPORT AND COMMUNICATION
VII	OTHER SERVICES - 1971 SIC ORDERS XXIII - XXVII

Finally, the decision was made to exclude those workers with "industry inadequately described" or with "workplace outside the United Kingdom" from all the analyses rather than adopt some arbitrary allocation procedure. But as the numbers involved, given below in Table 11, represent somewhat less than 1 per cent of all in employment the choice of action is not critical, and the same is true for each group taken individually. Having defined the sectors to be utilised the three shift-share analyses can now be performed.

TABLE 11 : EXCLUDED EMPLOYEES

YEAR	INDUSTRY INADEQUATELY DESCRIBED	WORKPLACE OUTSIDE UNITED KINGDOM	TOTAL
1951 ⁽¹⁾			18,596
1961	74,860	29,350	104,210
1971	170,100	7,320	177,420
1981	139,930	53,730	193,660

SOURCE : AS TABLE 1

(1) in 1951 the remainder group comprised industry not stated or ill-defined.

VI.iii 1951-1961

Each of the following sections will begin with a summary reproduction of the relative hourly earnings movements over the whole of the relevant decade based on the figures presented in the previous chapter; those for the current period being given in Table 12 below. This should serve to retain focus on the linkage, postulated in theory, between wage and employment levels. However, care should be taken in interpreting the information, not least because only the extreme points of each period are considered. These include earnings relative to part-time females, although a detailed industrial analysis of their employment is not available. However, they have formed a significant element of the increase in female employment over the post-war period (Joseph (1983), Robinson and Wallace (1984)).

TABLE 12 : HOURLY EARNINGS RELATIVES 1951-1961

	MALES 21+	FEMALES 21+	GIRLS <18	PART-TIME FEMALES 18+
BOYS <21	+8.9	+14.1	+11.5	+19.2
GIRLS <18	-2.5	+ 3.2		+ 6.2
FEMALES 18+	-4.8			+ 3.9
MALES 21+				+ 7.3

Source: October Earnings and Hours Inquiry 1951, 1961 : Ministry of Labour Gazette

Over the decade 1951-1961 total employment increased by 1,207,011 (5%). Looking at individual groups, young males in employment grew by 85,091 (6.9%), young females by 25,845 (2.2%), adult males by 265,957 (1.9%) and adult females by 738,987 (13.1%). Whilst therefore all groups shared in the employment growth, they did so very unevenly. Given that young males are the only group whose earnings discernibly rose against all others it may seem surprising that their rate of employment growth was actually above average. Also, the latter observation point followed closely upon the ending of conscription, which significantly reduced the intake of one large "employer" of young men. But it remains true that the largest growth of all was recorded by older females.

Before going on to conduct the shift-share analysis for the decade, Table 13 provides the absolute and percentage total employment changes by the 11 industries identified in order to complete the background. From it can be seen that the largest employment growth occurred in the professional and scientific services and insurance, banking and finance. The primary industries on the other hand shed nearly 20 per cent of their 1951 work-force.

(a) MALE YOUTHS

Table 14 shows that, in spite of their increased relative earnings over the period, young males actually increased their share of employment in seven of the eleven industries. Furthermore, the negative element for public administration and defence will reflect in large part the cessation of National Service in 1960. Additionally, in five of the industries in which young males increased their proportion of employment the share effect dominates the other two.

Also, it is of interest to note that the sum of the share effects contributes almost as much as the overall growth effect to the total change in male youth employment over the period.

TABLE 13 : INDUSTRY EMPLOYMENT CHANGES 1951-1961

INDUSTRY	ABSOLUTE EMPLOYMENT CHANGE	PERCENTAGE EMPLOYMENT CHANGE
AGRICULTURE, FORESTRY & FISHING	-270,739	-24.0
MINING AND QUARRYING	-119,044	-14.2
MANUFACTURING	311,016	3.9
CONSTRUCTION	211,622	15.2
GAS, ELECTRICITY AND WATER	20,186	5.7
TRANSPORT & COMMUNICATION	- 31,275	- 1.8
DISTRIBUTIVE TRADES	515,002	19.3
INSURANCE, BANKING & FINANCE	136,679	31.4
PROFESSIOANL & SCIENTIFIC SERVICES	596,374	39.1
MISCELLANEOUS SERVICES	29,729	1.3
PUBLIC ADMINISTRATION & DEFENCE	-278,153	-16.3
TOTAL	1,207,011	5.5

SOURCE : AS TABLE 1

NOTE: Those with industry ill-defined, not stated or working outside UK excluded.

Turning to the structure effects it can be seen that in all cases except manufacturing and miscellaneous services their sign is the same as those for the industry employment changes given in Table 13. The reason for the two perverse results can be found in the industries concerned having employment growths less than that which

TABLE 14
1951-1961 MALES LESS THAN 20 EMPLOYMENT CHANGE DECOMPOSITION

	SHARE	STRUCTURE	GROWTH	TOTAL	(E-A) ERROR
Agriculture Forestry & Fishing	-3,044	-29,809	4,583	-28,270	-12
Mining & Quarrying	-1,661	-10,039	2,465	-9,235	-4
Manufact- uring	77,669	-5,341	22,637	94,965	16
Construc- tion	11,333	14,170	7,587	33,090	-13
Gas, Elect. & Water	242	81	724	1,047	0
Transport & Communi- cation	9,951	-4,255	3,096	8,792	8
Distribu- tive Trades	46,508	17,757	6,940	71,205	-73
Banking, Insurance & Finance	9,317	4,126	916	14,359	-26
Profession- al & Scientific	-2,967	8,572	1,519	7,124	10
Misc. Services	44,759	-3,220	4,357	45,896	20
Public Admin. & Defence	-130,061	-36,079	7,873	-158,267	-365
TOTAL	62,046	-44,037	62,697	80,706	-439

occurred nationally. That is, in spite of growing in absolute employment terms, these two industries constituted a smaller proportion of total employment in 1961 than they did in 1951. In aggregate one can see that, over the decade, youths lost employment through being concentrated in relatively declining industries. However, this adverse effect was swamped by share and growth effects - the latter of which is, of course, constrained to be positive given that aggregate employment increased.

(b) FEMALE YOUTHS

As already stated, the total employment of girls increased over the period, but by a comparatively small amount. Again, as required by the methodology adopted, the growth effect contributed positively, by over 60,000, to this change, as shown in Table 15. Furthermore, as one might intuitively expect, the last five service industries identified produced almost all of the positive contribution to the overall increase in their employment.

No clear evidence has been found to indicate that the relative earnings of young women increased during this decade and, in fact, they fell slightly against those of young males. Nevertheless, unlike boys, the share of young females in the employment of six of the industries declined. Most strikingly of all, the distributive trades fall within this category whilst mining and construction actually emerged within the minority exhibiting positive share contributions. Summing the share effects produced a relatively very large, negative contribution to the overall growth of girls employment of 85,000. This was compensated for by individually smaller, but overall dominating, structure and growth effects.

TABLE 15

1951-1961 FEMALES LESS THAN 20 EMPLOYMENT CHANGE DECOMPOSITION

	SHARE	STRUCTURE	GROWTH	TOTAL	(E-A) ERROR
Agriculture Forestry & Fishing	-1,295	-4,850	746	-5,399	-5
Mining & Quarrying	654	-651	160	163	2
Manufacturing	-83,851	-6,112	25,908	-64,055	-12
Construction	1,954	1,010	541	3,505	-2
Gas, Elect. & Water	-1,051	36	324	-691	0
Transport & Communi- cation	-1,334	-2,447	1,780	-2,001	-2
Distribu- tive Trades	-15,736	35,414	13,842	33,520	25
Banking, Insurance & Finance	16,115	12,173	2,702	30,990	-45
Profession- al & Scientific	-28,894	28,807	5,105	5,018	100
Misc. Services	16,953	-5,281	7,146	18,818	8
Public Admin. & Defence	11,512	-8,158	1,780	5,134	32
TOTAL	-84,973	49,941	60,034	25,002	101

Turning to the structure, or industrial composition, movements it can be seen that young females benefited from being relatively heavily concentrated in industries which grew rapidly over the period. In particular, they enjoyed a heavy representation in the distributive trades, banking, insurance and finance and professional and scientific services which all grew abnormally quickly. It is to be noted, however, that their share in the employment of two of these industries fell and in one of them (professional and scientific services) this influence outweighed the structural effect.

(c) ADULT MALES

In relation to its initial value, adult male employment grew the most slowly of all groups over the period under study.⁽²⁶⁾ As Table 16 shows, their relative performance was affected by both adverse share and structural components. Concentrating on the share components first, one can see that, in spite of the fact that male earnings relative to those of boys fell, they had a negative share component in six industries where that of boys was positive. The largest reversal of fortune occurred in the distributive trades where the decline in employment on this score was nearly 50,000 greater in absolute value than the total for all share effects. Somewhat surprisingly perhaps, they made their greatest inroad into the miscellaneous service industry, and this it should be remembered is after taking account of the movement between SIC's of the vehicle repairs etc M.H.

In terms of the industrial structure effect older men registered a loss of employment of a quarter of a million jobs, or over 2 per cent of their total in 1951, in agriculture and public administration

TABLE 16
1951-1961 MALES 20 AND OVER EMPLOYMENT CHANGE DECOMPOSITION

	SHARE	STRUCTURE	GROWTH	TOTAL	(E-A) ERROR
Agriculture Forestry & Fishing	-5,596	-256,019	39,363	-222,252	-23
Mining & Quarrying	-7,705	-144,220	35,411	-116,514	-20
Manufact- uring	26,618	-60,693	257,253	223,178	-1
Construc- tion	-31,663	118,730	63,568	150,635	34
Gas, Elect. & Water	-8,406	1,742	15,637	8,973	0
Transport & Communi- cation	-25,512	-95,578	69,550	-51,540	-22
Distribu- tive Trades	-168,016	185,254	72,407	89,645	263
Banking, Insurance & Finance	-43,127	65,462	14,531	36,866	118
Profession- al & Scientific	-30,019	196,388	34,804	201,173	104
Misc. Services	97,565	-33,376	45,163	109,352	44
Public Admin. & Defence	68,966	-256,215	55,914	-131,335	193
TOTAL	-120,142	-299,585	685,684	298,181	690

alone. These developments, the latter of which will once again have been affected by the demise of national service, made a considerable contribution towards the overall loss from an unfavourable industrial concentration over the period of some 300,000 jobs. Only the magnitude of the economy wide growth effect allowed adult male employment to grow over the decade.

(d) ADULT FEMALES

The results for this group hold a special interest in discussions of the fortunes of youths in the labour market as the growth in their employment is frequently alleged to have been at the expense of younger workers.⁽²⁷⁾ To condition the findings, it will be recalled that part-time females appear to have become cheaper relative to all other groups over the period, whilst those working full-time cheapened relative to male youths. Table 17 presents the components of change of the increase in employment of three quarters of a million that older women enjoyed between 1951 and 1961.

Looking firstly at the share components, in only two industries, manufacturing and miscellaneous services, were these negative.⁽²⁸⁾ The second of these constitutes something of a surprise, particularly as it is by far the largest individual element in absolute terms. But it is further of interest to note that in these industries the share effects for young and adult males were positive, and relatively large. However, as far as adult females are concerned, the remaining share movements were sufficient to swamp these reversals; the largest contributions coming from the distributive trades and the professional and scientific services.

The overall structural effect for adult females, along, of course, with the growth effect, was also positive. Indeed, their

TABLE 17
1951-1961 FEMALES 20 AND OVER EMPLOYMENT CHANGE DECOMPOSITION

	SHARE	STRUCTURE	GROWTH	TOTAL	(E-A) ERROR
Agriculture, Forestry & Fishing	9,934	-29,251	4,497	-14,820	38
Mining & Quarrying	8,712	-2,877	706	6,541	21
Manufacturing	-20,435	-23,888	101,252	56,929	-2
Construction	18,376	3,917	2,097	24,390	-21
Gas, Elect. & Water	9,214	165	1,447	10,826	-31
Transport & Communi- cation	16,894	-12,567	9,145	13,472	14
Distribu- tive Trades	137,237	131,854	51,535	320,626	-221
Banking, Insurance & Finance	17,695	30,087	6,679	54,461	-50
Profession- al & Scientific	61,880	272,828	48,351	383,059	-214
Misc. Services	-159,270	-42,304	57,243	-144,331	-66
Public Admin. & Defence	49,583	-55,348	12,079	6,314	139
TOTAL	149,820	272,616	295,031	717,467	-393

favourable industrial distribution contributed almost as much as the general growth effect to their total employment increase. In particular, they benefited enormously from their presence within the two industries within which their employment share increased most markedly. In total, therefore, confirmation has been provided that the growth in the importance of females began early in the post-war period. In this early phase, however, with the notable exception of public administration, the evidence from the share components suggest that if this was at the expense of young people it was girls who suffered rather than the male youths. The next section goes on to explore whether this pattern was maintained over the following decade.

V.iv 1961-1971

Once again whatever movements in relative earnings were discernible in this decade involved increases in those of young males relative to other groups. However, it is to be stressed that none of these were particularly significant, taking the decade as a whole.

TABLE 18 : PERCENTAGE CHANGES IN HOURLY EARNINGS RELATIVES 1961-1971

Denominator Numerator	MALES 21+	FEMALES 18+	GIRLS <18	PART-TIME FEMALES 18+
BOYS <21	+8.2	+7.4	+7.1	+6.7
GIRLS <18	0	-1.5		0
FEMALES 18+	+1.7			0
MALES 21+				0.6

SOURCE : October Earnings Hours and Inquiry 1961, 1971 : Ministry of Labour and Department of Employment Gazettes.

The magnitude of the changes in the relatives, comparing just the two boundary years, is provided in Table 18 and may be used as a backdrop to the ensuing employment shift-share analysis. From it, one might most strongly hypothesise that young males would have negative share effects. But before looking at more detailed changes, the broad employment trends over the period are first presented.

Over the decade total employment increased by nearly 400,000 (1.6%), although there was considerable variation around this relative increase across the four age-sex groups. Thus, the employment of young males fell by over a quarter of a million (20%), that of young females by nearly 300,000 (24%) and that of adult males by around 450,000 (3%). Therefore, the 1.4 million (22%) increase in the employment of adult females was responsible for the whole of the overall positive employment change. Finally, to complete the background to employment change over the decade, Table 19 below breaks it down by industry.

As in the previous decade, the largest employment growths were recorded in banking, insurance and finance and the professional and scientific services, with the former increasing by two thirds of its original size. By far the largest employment losses on the other hand were recorded in agriculture and mining, where they totalled a quarter and almost one half, respectively, of their 1961 levels. The other notable change over the period was the 10 per cent increase in employment recorded in public administration and defence. Given this brief background, attention can now be turned to the shift-share analysis.

TABLE 19 : INDUSTRY EMPLOYMENT CHANGES 1961-1971

INDUSTRY	ABSOLUTE EMPLOYMENT CHANGE	PERCENTAGE EMPLOYMENT CHANGE
AGRICULTURE FORESTRY & FISHING	-220,630	-25.8
MINING AND QUARRYING	-330,510	-45.8
MANUFACTURING	-249,850	- 3.0
CONSTRUCTION	69,380	4.3
GAS, ELECTRICITY & WATER	- 15,100	- 4.0
TRANSPORT AND COMMUNICATION	-109,000	- 6.5
DISTRIBUTIVE TRADES	-172,690	- 5.4
INSURANCE, BANKING & FINANCE	380,370	66.5
PROFESSIONAL & SCIENTIFIC SERVICES	781,180	36.8
MISCELLANEOUS SERVICES	39,560	1.7
PUBLIC ADMINISTRATION & DEFENCE	144,990	10.2
TOTAL	317,700	1.4

SOURCE : AS TABLE 1

NOTE: Those with industry inadequately described or working outside UK excluded.

(a) MALE YOUTHS

Table 20 presents the results from the shift-share decomposition of the quarter of a million fall in the employment of young males between 1961 and 1971. As hypothesised earlier, the negative share effects in ten of the eleven industries are what one might expect in a period in which the relative wages of young men increased. Indeed

TABLE 20
1961-1971 MALES LESS THAN 20 EMPLOYMENT CHANGE DECOMPOSITION

	SHARE	STRUCTURE	GROWTH	TOTAL	(E-A) ERROR
Agriculture Forestry & Fishing	-20,235	-18,017	791	-37,461	21
Mining & Quarrying	-5,888	-19,368	434	-24,822	12
Manufact- uring	-55,463	-20,627	6,392	-69,698	8
Construc- tion	-48,551	4,330	2,036	-42,185	-5
Gas, Elect. & Water	528	-823	205	-90	0
Transport & Communi- cation	-11,076	-4,791	804	-15,063	3
Distribu- tive Trades	-31,294	-10,926	2,143	-40,077	7
Banking, Insurance & Finance	-14,222	13,626	380	-216	-24
Profession- al & Scientific	-14,117	9,929	453	-3,735	-15
Misc. Services	-8,436	361	1,465	-6,610	0
Public Admin. & Defence	-20,510	6,624	1,082	-12,804	-6
TOTAL	-229,264	-39,682	16,185	-252,761	1

having taken account of the other two components of change their employment decreased in every industry. The gas, electricity and water industries were the only area in which they increased their share of overall employment and this benefited them by only a little over 500.

Turning to the structure effects these were all of the same sign as the overall employment change by industry, and whilst, in total, they accounted for a loss of almost 40,000 jobs this was less than one-fifth as many as the sum of the share effects. The most notable declines on this score arose in the primary and manufacturing industries whilst the largest gains were made in banking, insurance and finance and the professional and scientific services. But although comparatively small, the overall effect was that young males suffered from having an unfavourable industrial distribution at the beginning of the decade. Finally, the growth effects were, of course, positive in all industries, but they were small and overall only contributed some 16,000 jobs for young men over the period.

(b) FEMALE YOUTHS

The results of the shift-share analysis on young females' employment change over the period 1961-1971 are presented in Table 21. In total, their employment fell by almost one quarter over this decade and this was reflected in job losses in eight of the eleven industries identified. But, unlike young males, there was no evidence that girls earnings relative to adults rose and yet it can be seen that ten of the share effects were negative. The only exception was once again gas, electricity and water, although their employment gain there was

TABLE 21
1961-1971 FEMALES LESS THAN 20 EMPLOYMENT CHANGE DECOMPOSITION

	SHARE	STRUCTURE	GROWTH	TOTAL	(E-A) ERROR
Agriculture Forestry & Fishing	-3,218	-2,850	125	-5,943	-3
Mining & Quarrying	-98	-1,506	34	-1,570	0
Manufact- uring	-153,108	-17,845	5,530	-165,423	-23
Construc- tion	-2,060	347	163	-1,550	0
Gas, Elect. & Water	763	-351	88	500	0
Transport & Communi- cation	-4,959	-2,538	426	-7,071	-1
Distribu- tive Trades	-78,274	-17,260	3,385	-92,149	-19
Banking, Insurance & Finance	-20,016	41,345	1,154	22,483	33
Profession- al & Scientific	-39,969	30,586	1,394	-7,989	41
Misc. Services	-45,353	444	1,800	-43,109	1
Public Admin. & Defence	-25	3,313	541	3,892	-1
TOTAL	-346,317	33,685	14,640	-297,992	28

slight. Overall the sum of the share effects amounted to an employment loss of almost 350,000 for this group over the period.

Young females did, on the other hand, benefit from a favourable industrial distribution. Thus although the structure effects were negative in the majority of industries the overall contribution was positive. This was principally due to the relatively heavy concentration of young females in the two fastest growing industries over the decade - the financial and professional and scientific services. The third column of the table presents the, necessarily positive, growth effects but, as can be seen, they were always comparatively small and overall accounted for only 15,000 jobs.

(c) ADULT MALES

The components of change for adult male employment over the decade are presented in Table 22, in which it can be seen that both adverse share and structure effects contributed to the overall decline of approaching half-a-million in the number of jobs held by this group. In spite of the fact that there is no evidence of male relative earnings having risen, the share effects, given in column 1, operated to the detriment of this group in nine of the industries. The only two exceptions to this were manufacturing and construction, but the gains in men's employment therein from this source still left an aggregate share effect amounting to a loss of nearly 300,000 jobs. Interestingly, perhaps, the largest positive share effect was in manufacturing, an industry already in the throes of decline, whilst the largest negative component occurred in public administration and defence, a sector which one might expect to have been pioneering

TABLE 22
1961-1971 MALES 20 AND OVER EMPLOYMENT CHANGE DECOMPOSITION

	SHARE	STRUCTURE	GROWTH	TOTAL	(E-A) ERROR
Agriculture Forestry & Fishing	-26,443	-179,921	7,896	-198,468	-28
Mining & Quarrying	-2,130	-306,705	6,872	-301,963	-3
Manufact- uring	152,059	-232,724	72,117	-8,548	22
Construc- tion	23,028	40,482	19,038	82,548	-2
Gas, Elect. & Water	-22,424	-16,485	4,115	-34,794	-4
Transport & Communi- cation	-44,874	-106,202	17,824	-133,252	-12
Distribu- tive Trades	-109,676	-97,517	19,127	-188,066	-26
Banking, Insurance & Finance	-54,171	187,506	5,234	138,569	89
Profession- al & Scientific	-77,066	271,976	12,398	207,308	78
Misc. Services	-22,234	3,231	13,103	-5,900	0
Public Admn. & Defence	-114,350	87,735	14,326	-12,289	31
TOTAL	-298,280	-348,625	192,051	-454,855	145

travel towards more equal employment opportunities between the sexes.

To an even greater extent than their younger counterparts, adult males suffered from an unfavourable industrial distribution with the aggregate of the structure effects losing them nearly 350,000 jobs. This was considerably larger than the losses they suffered from the share effects. The largest individual loss under the structure component occurred in mining and quarrying, the size of which was nearly as great as the overall employment loss in that industry over the decade. This provides an exceptionally clear example of how concentration, even in a comparatively small industry, can strongly influence a work group's fortunes through time. Finally, the growth effects provided some relief for older men's employment behaviour by generating almost 200,000 new jobs to partially offset the other two negative influences.

(d) ADULT FEMALES

Lastly, attention is turned to the shift-share decomposition of adult females employment change over the period and the picture is in sharp contrast to those presented above for the other groups. Thus, in aggregate, their employment grew by over 1.3 million in the ten year period. As Table 23 shows, this arose as the sum of three positive influences, of which the general growth effect was by far the smallest. It was shown earlier that there was little movement in adult females relative earnings over the period and yet the share effects are all considerable, with the distributive trades making the largest individual contribution to the aggregate effect of nearly

TABLE 23
1961-1971 FEMALES 20 AND OVER EMPLOYMENT CHANGE DECOMPOSITION

	SHARE	STRUCTURE	GROWTH	TOTAL	(E-A) ERROR
Agriculture, Forestry & Fishing	49,897	-29,970	1,315	21,242	52
Mining & Quarrying	8,116	-10,504	235	-2,153	17
Manufacturing	77,188	-91,297	28,291	14,182	12
Construction	27,583	2,030	955	30,568	-2
Gas, Elect. & Water	21,133	-2,464	615	19,284	4
Transport & Communication	60,909	-17,451	2,929	46,387	17
Distributive Trades	219,245	-89,125	17,481	147,601	51
Banking, Insurance & Finance	88,409	127,564	3,561	219,534	-146
Professional & Scientific	130,267	434,764	19,818	584,849	-881
Misc. Services	76,023	3,790	15,367	95,180	0
Public Admin. & Defence	134,884	26,965	4,403	166,252	-38
TOTAL	893,654	354,302	94,970	1,342,926	-914

900,000 jobs. Furthermore, in this instance, the evidence is strong that the price of increasing the proportion of all industries employment for which they accounted was paid by all other groups in the market. However, in general, the effects were proportionately greater for young people.

The structure effects also on balance operated in favour of older women, they having been the source of over 350,000 new jobs. As normally expected, all of these were of the same sign as the overall employment changes by industry, with the professional and scientific services providing far and away the largest individual positive contribution. But it must be noted that no attempt has been made to separate any of the effects for females into their full and part-time components, and so the analysis is silent on actual trends in resource utilisation.⁽²⁹⁾

V.v 1971-1981

To most, this latest decade covered by census information will represent the most interesting. Unfortunately, the degree of detail available is reduced over previous decades owing to the fundamental revision to the SIC in 1980, as discussed earlier. Nevertheless, the paucity of alternative data sources still renders even the limited exercise possible of some interest.⁽³⁰⁾ It might be objected at this point that the raising of the school leaving age in 1973 will serve further to bedevil analysis over this period. But, in principle, this had but a once over effect in reducing the number of school leavers in the year following the passage of the Act.⁽³¹⁾ The truth of this will depend in part on the substitutability of 15 and 16 year olds and in part on the aspirations of those "forced" to remain

in school an extra year compared to what they would have been without the constraint. To the extent that such effects operated to belie the once over assumption they are here ignored. Before conducting the analysis, however, the movements in relative earnings over the decade will first be presented as background, and Table 24 provides this information.

As can be seen, the most significant of these were the cheapening of adult males relative to all other groups of worker and the increase in the relative earnings of young females relative to all other groups except young males, where the movement was slight. The firmest working hypothesis would therefore be to expect positive share effects for the former group and negative ones for the latter.⁽³²⁾ Before examining whether those expectations are upheld, however, the general employment movements over the decade will be charted.

TABLE 24 : PERCENTAGE CHANGES IN HOURLY EARNINGS RELATIVES 1971-1981

DENOMINATOR NUMERATOR	MALES 21+	FEMALES 18+	GIRLS <18	PART-TIME FEMALES 18+
BOYS <21	+11.3	-2.3	-0.9	-1.1
GIRLS <18	+23.1	+7.8		+8.7
FEMALES 18+	+13.1			+0.9
MALES 21+				-10.8

SOURCE : October Earnings and Hours Inquiry 1971, 1981 : Department of Employment Gazette

Within the parameters of the present study, total employment fell for the first time with the decline of over 850,000 representing some 3.6 per cent of the 1971 workforce. Three of the groups shared the misfortune to a reasonably similar extent, these being the two male categories and younger females. Their respective losses, with young males first, were 109,000, 1,158,000 and 130,000 jobs which amounted to 10,8 and 14 per cent of their 1971 employment totals. As in the previous decades, however, the employment of older females increased substantially; this time by something over half-a-million (7%).

Turning to the employment changes by industry, Table 25 shows that the service industries actually achieved an employment growth of 12 per cent, in spite of the recession. All other industries, however, returned negative employment changes to help contribute to the overall decline in those in work. The largest of these was recorded in the manufacturing sector, a trend which has inspired the controversy surrounding Bacon and Eltis (1976), where the decline amounted to almost 24 per cent. For the third successive decade the primary industries suffered double figure percentage employment reductions, this time being the largest in agriculture, the gross result of which was that the primary sector employed over one million fewer workers in 1981 than it did in 1951; a reduction amounting to almost 60 per cent of its earlier level. In the light of these general developments, attention is now turned to the detailed shift-share analysis by age-sex group.

TABLE 25 : INDUSTRY EMPLOYMENT CHANGES 1971-1981

INDUSTRY	ABSOLUTE EMPLOYMENT CHANGE	PERCENTAGE EMPLOYMENT CHANGE
AGRICULTURE, FORESTRY & FISHING	- 120,200	-18.9
MINING AND QUARRYING	- 42,360	-10.8
MANUFACTURING	-1,943,490	-23.9
CONSTRUCTION	- 40,910	- 2.5
GAS, ELECTRICITY AND WATER	- 18,770	- 5.2
TRANSPORT AND COMMUNICATION	- 30,470	- 1.9
OTHER SERVICES	1,322,280	12.2
TOTAL	- 873,920	- 3.7

SOURCE: AS TABLE 1

NOTE: Those with industry inadequately described or working outside U.K. excluded

(a) YOUNG MALES

As has been shown above, young males' earnings over the decade only rose against older males and actually fell slightly against all female groups. However, Table 26 reveals that the share effects worked against them most heavily in the relatively female intensive manufacturing and service industries. The employment losses recorded under this influence in these industries indeed went most of the way to ensuring that the total share effect made the largest overall contribution to their total job loss of nearly 125,000. But it should be noted that the young males increased their overall employment in the service sector, an outcome only replicated in the construction industry.

TABLE 26 : 1971-81 MALES <20 EMPLOYMENT CHANGE DECOMPOSITION

	SHARE	STRUCTURE	GROWTH	TOTAL	ERROR (E-A)
AGRICULTURE, FORESTRY AND FISHING	4,142	- 6,711	- 1,477	- 4,046	-6
MINING AND QUARRYING	1,190	- 1,521	- 750	- 1,081	-1
MANUFACTURING	-5,6974	-83,048	-13,412	-153,434	126
CONSTRUCTION	8,229	1,701	- 4,949	4,981	1
GAS, ELECTRICITY AND WATER	- 2,597	- 206	- 506	- 3,309	1
TRANSPORT AND COMMUNICATION	- 1,272	920	- 1,917	- 2,269	1
OTHER SERVICES	- 9,381	58,378	-14,421	34,576	-13
TOTAL	-56,663	-30,487	-37,432	-124,582	109

The growth effect, of course, made a negative contribution to boys employment change over the period, and this amounted to some 30 per cent of the total fall. Additionally, and for the third consecutive decade, this group suffered from an unfavourable industrial distribution. In particular, they were heavily penalised for their presence in the manufacturing industries wherein the overall employment loss was the largest recorded. Indeed the structure effect there alone was 67% of their total employment loss and the overall reduction in their presence in that sector was even greater than this. But, unlike in previous decades, the other structural losses were not large and young males benefited from their presence in the service sector where the employment gains amounted to nearly 60,000.

(b) YOUNG FEMALES

It will be recalled that the relative earnings of young females increased rather more noticeably over the decade taken as a whole than did those of young males, but the pattern of their employment change, reported in Table 27, bear some fairly strong similarities; notwithstanding the fact that girls lost 20,000 more jobs overall. Thus, only in the construction and transport industries were there discrepancies in the sign of the share effects, although these were not particularly significant in magnitude. The biggest differences occurred in the manufacturing and service industries where the combined excess fall of some 74,000 jobs in the case of girls accounted for nearly all of their greater losses due to share effects.

As required, the growth effect made a negative contribution to the girls employment change although it only represented 22.5 per cent of the total, which was somewhat less than in the case of young men. Interestingly, however, whilst the individual structure effects are of the same sign for boys and girls the latter group actually benefited in total from their industrial distribution. In large part this resulted from their relatively heavy presence in the expanding service sector and relative under-representation in the markedly declining manufacturing sector. The overall structure effect of some 28,000 additional jobs, however, was insufficiently large to make strong inroads into the declines registered under the other two components of change.

TABLE 27 : 1971-81 FEMALES <20 EMPLOYMENT CHANGE DECOMPOSITION

	SHARE	STRUCTURE	GROWTH	TOTAL	ERROR (E-A)
AGRICULTURE, FORESTRY AND FISHING	1,322	- 1,118	- 246	-42	-2
MINING AND QUARRYING	196	- 131	- 65	0	0
MANUFACTURING	-82,451	-57,319	-9,257	-140,927	183
CONSTRUCTION	- 2,243	129	- 377	- 2,491	-1
GAS, ELECTRICITY AND WATER	- 651	- 95	- 234	- 980	0
TRANSPORT AND COMMUNICATION	1,691	517	- 1,077	1,131	1
OTHER SERVICES	- 57,902	86,151	-21,282	6,967	-84
TOTAL	-140,038	28,134	-32,538	-144,442	97

(c) ADULT MALES

The most striking feature of the results for adult males, given in Table 28, is the fact that their employment declined not only overall, but also in each industry taken individually. Furthermore, with the exception of manufacturing, the same pattern was reproduced in the share effects - in spite of the fact that adult male earnings appeared to decline relative to all other groups over the decade. In particular, they suffered heavily in the growing service sector (losing a third of a million jobs). Clearly, because of the aggregation involved, the findings here can only be taken to represent first stage results, but they do seem to strengthen the earlier view that care should be taken in applying the October Earnings Inquiry

TABLE 28 : 1971-81 MALES 20+ EMPLOYMENT CHANGE DECOMPOSITION

	SHARE	STRUCTURE	GROWTH	TOTAL	ERROR (E-A)
AGRICULTURE, FORESTRY AND FISHING	-4,595	-74,668	-16,439	-95,702	8
MINING AND QUARRYING	-7,051	-25,415	-12,529	-44,995	5
MANUFACTURING	93,199	-1,101,906	-177,948	-1,186,655	-205
CONSTRUCTION	-44,503	18,239	-53,070	-79,334	-4
GAS, ELECTRICITY AND WATER	-9,082	- 4,214	-10,351	-23,647	3
TRANSPORT AND COMMUNICATION	-39,825	22,021	-45,912	-63,716	-6
OTHER SERVICES	-330,696	763,201	-188,532	243,973	-477
TOTAL	-342,553	-402,742	-504,781	-1,250,076	-676

statistics to the economy as a whole. But, this said, the positive share effect in manufacturing of over 90,000 jobs was not inconsiderable.

The structure effects for adult males also contributed heavily in aggregate to their job losses, with the decline in the proportionate size of the manufacturing sector alone accounting for over one million men. The only real offset to this came from the service sector where, in spite of the groups concentration being comparatively low, their absolute size ensured a positive structure effect of over three-quarters of a million. This absolute importance in the labour market, however, was also the cause of the aggregate growth effect being the largest contributing influence, in absolute terms, to their employment change over the decade, a feature not shared by any other group.

(c) ADULT FEMALES

The results of the shift-share analysis for adult females, given in Table 29, present a sharp contrast to those of other groups. Thus, in all but one industry the share effect was positive and its magnitude in the exception, agriculture, amounted to less than 1,000 jobs. Also the gains made by older females on this score in other industries and the increase in the service sector of over a quarter of a million jobs over the decade amounted almost to the total job losses of young people of both sexes in the same period. Furthermore, in the traditional male bastions of mining and construction the positive overall employment gain by older females was in marked contrast to the total employment changes therein.

Adult women also benefited from their distribution through the industrial structure over the decade. The aggregate contribution from this component of their employment change being, in fact, the largest of the three and amounted to over 400,000 jobs. This result, however, is largely a function of the developments in the manufacturing and service sectors with adult females gaining approximately twice as many jobs through the expansion of the latter than they lost through manufacturing's decline. The growth effects were of course all negative; but in this instance their overall contribution was the smallest recorded, thereby emphasising the significance of the gains made by older females. Whilst remembering the caveats introduced by the parallel growth in part-time working, it seems difficult using the approach of this section not to ascribe much of the youth labour market problem to the growth of adult female participation.

TABLE 29 : 1971-81 FEMALES 20+ EMPLOYMENT CHANGE DECOMPOSITION

	SHARE	STRUCTURE	GROWTH	TOTAL	ERROR (E-A)
AGRICULTURE, FORESTRY AND FISHING	-868	-16,015	-3,526	-20,409	1
MINING AND QUARRYING	5,664	-1,305	-643	3,716	-4
MANUFACTURING	28,338	-433,090	-69,940	-474,692	-62
CONSTRUCTION	38,517	1,352	-3,935	35,934	4
GAS, ELECTRICITY AND WATER	12,330	-915	-2,247	9,168	-2
TRANSPORT AND COMMUNICATION	39,407	4,627	-9,648	34,386	6
OTHER SERVICES	249,917	859,682	-212,366	897,233	361
TOTAL	373,305	414,336	-302,305	485,336	304

VI. CONCLUSION

This chapter has examined in some detail the developments in employment patterns which occurred over the thirty year period 1951-1981. Throughout this era young people have had a relatively more heavily concentrated industrial employment distribution than have older workers of the same sex, although the differences, at least at the level of data disaggregation used here, are perhaps not quite so great as one might expect. Also the hypothesis that employment in aggregate is distributed throughout the industrial structure in proportion to group and industry importance can be resoundingly rejected at each census point.

When attention turns to more detailed employment movements over the period some quite interesting facts emerge. Most commentaries date the emergence of the crisis in the youth labour market to the 1970's. Looking at the increase in their unemployment from January 1971 to January 1981, for example, such an interpretation appears understandable. Thus in that time boys unemployment increased by 81,000 and that of girls by nearly 74,000. Furthermore, the evidence produced here shows that, in large part, this reflects their falling employment over that period. Significantly, however, this latter was actually considerably larger in absolute magnitude than the increase in their unemployment. Furthermore, the declines for both young males and young females were larger than could be accounted for by the general decline in aggregate employment. The major responsibility for this lay with large negative share and structural effects in the manufacturing industries, although their share losses in the service sector were not inconsiderable, particularly for young males.

However, it seems rarely to be recognised that this employment decline began in the previous decade, when in fact their job losses were considerably greater than in the 1970's. Thus between 1961 and 1971, a decade in which, when taken as a whole, employment was still increasing, the number of jobs held by young males fell by a quarter of a million and those by young females some 300,000. Even more so than in later years this was due to adverse share effects - those in the manufacturing industries once again and that portion of the service sector formerly classified as the distributive trades being the most significant.

As stated at the outset, the labour market behaviour of older females is often regarded as an important determinant of the fortunes of young people. It has been shown that, in a comparative context, the performance of adult women in the post-war British labour market has been remarkable. Thus in only 3 out of a possible 29 cases were their share effects negative, and their total employment increased considerably in all three decades. Furthermore, they always benefited in aggregate from a favourable industrial distribution or, more bluntly, from being in the right place at the right time.

But, even when account was taken of the employment developments for older workers over the whole of the period analysed, it emerged that the observations for young people, or indeed adults, could not readily be accounted for by casual reference to movements in relative earnings. Several possible rationalisations for this exist, not least of which are the degree of aggregation used in the employment data and the potential deficiencies surrounding the earnings statistics, the latter of which were discussed in some detail in the previous chapter. But, whilst the findings of the chapter are of interest in their own right, it has to be recognised that the analysis was essentially uni-dimensional and takes no account, for instance, of supply influences. When employment changes have been markedly different to those in unemployment, there is a clear suggestion that this issue requires some investigation.⁽³³⁾ Therefore, the study turns to a multivariate approach to the performance of young people in the post war labour market with unemployment being substituted as the phenomenon to be explained.

- (1) As such, structuralist and pay rigidity arguments are to a large extent complementary.
- (2) For attempts to discover whether there is evidence of labour market duality in Great Britain see, for instance, Bosanquet and Doeringer (1973) and McNabb and Psacharopoulos (1981).
- (3) Similar reasoning has been invoked in certain British attempts to model youth unemployment, principally those of Makeham (1980) and Lynch and Richardson (1982). However, as brought out more fully in Chapter 5, the methodology employed was not wholly satisfactory.
- (4) Note that a problem which is largely ignored in the present chapter is that comparisons from institutional censuses/surveys may involve different points of the economic cycle.
- (5) There was also a sample census in 1966. The other possible source of sex-age delimited information was the old Department of Employment annual national insurance card count which ceased in 1972.
- (6) Any other seemingly reasonable definition of youth, save that of being aged less than 25 years, is debarred by the more aggregative nature of the early Scottish figures.
- (7) Attempts to test some of the ideas can be found in Osterman (1975) and Leigh (1976). Detailed critiques of the literature can be found in Wachter (1974) and Cain (1976).
- (8) Given the figures with which these importance measures are to be compared a moment's reflection will reveal that knowledge of any three will yield the fourth. The concepts are brought together in the shift-share analysis of the following section.
- (9) It is, therefore, simply the sum of the largest five industry totals used in computing CR_1 .
- (10) On the genesis of the Herfindahl see Hirschman (1964). On concentration measures in general see Hay and Morris (1979, Chapter 3).
- (11) On the chi-square statistic see, for instance, Spiegel (1972).
- (12) To ensure conformity with later years motor vehicle repairs were transferred from Order Head Vehicles to Miscellaneous Services. See Appendix.

- (13) Legislative provisions may, of course, be important in these industries as well as the transport example given earlier. Also supply influences of the Casson (1979) type, discussed in Section 1, may be important.
- (14) Note that whilst girls did not "benefit" directly from conscription there may have been an indirect effect in that they were substituted for scarce males in other industries.
- (15) That the measure based on all industries supports that based on only five, rather than the CR₁ index, is indicative of the problems caused by switching Lorenz, or concentration, curves.
- (16) On top of human capital and redundancy pay arguments one should note also the likely strengthening impact of differential turnover on these influences.
- (17) An insurmountable problem with the 1981 figures is that no attempt was made to control for the various job creation measures. As the returns are self-completed it is not even clear whether people on them regard themselves as in work or unemployed.
- (18) See the Appendix for the adjustment made to the 1951 data to make this true.
- (19) In spite of the titles of some of the industries which employed a large number of females, heterogeneous occupational structures and also hierarchies within these effectively debar any conclusions regarding professionalisation of the female workforce (see Webster (1985)).
- (20) For some suggestive evidence on this see, for example, Manpower Services Commission (1978). But note that this may be due to some independent effects from the growth of jobs with "non-standard" work requirements (Bosworth and Dawkins (1981b)) for which young people do not, for some reason, compete (e.g. part-time work).
- (21) For completeness, however, these residuals will be reported in all actual computations.
- (22) On homotheticity see, for instance, Dixon et. al. (1980).
- (23) Berndt and Khaled (1979) explicitly test for, and "decisively reject", homotheticity in United States manufacturing 1947-1951.

- (24) See below for the criticisms raised about trying to isolate independent causality; although immediately it can be seen that this is a very "institutionalist" approach.
- (25) The situations it is usually employed to analyse revolve around industrial location, such as Stilwell (1969), Chalmers and Beckhelm (1976), Lloyd (1979); but it has also been used to investigate, inter alia, regional policy (Moore and Rhodes (1973), (1976)), and employment growth (Paris (1970)).
- (26) In the post-war period in general "retirement" (wealth?) effects appear to counteract cohort effects for this group.
- (27) A more detailed treatment might attempt to separate older females by marital status.
- (28) The National Insurance card count shows that the share of part-time females engaged in part-time manufacturing rose from 12.2 to 13.7 per cent.
- (29) But this is equally true of any employment analysis which does not take account of hours of work.
- (30) The only other possibility with currently available data would be an exercise involving one of the sample surveys. However they are, in general, small and their sampling properties for an exercise of this sort unknown. The Labour Force Survey seems likely to be the most promising alternative, but this has only been running since 1973.
- (31) This point is taken up again in the following chapter.
- (32) See Chapter 3 for earnings movements within the decade.
- (33) But note the seasonality problem with the youth unemployment statistics. This is taken up fully in the following chapter.

APPENDIX

For the years 1951, 1961 and 1971, whether considered alone or pairwise, the adjustments made to generate the eleven industries used in the text were straightforward. These were:

1951: M.H 81 - Motor repairers and garages - transferred from Order VII - Vehicles - to Order XXIV - Miscellaneous services.

Manufacturing comprised the sum of Orders III-XVI.

1961: Manufacturing comprised the sum of Orders III-XVI.

1971: Manufacturing comprised the sum of Orders III-XIX.

When employment movements 1971-1981 were considered the most compatible classification available was based upon:

- 1971:
1. Agriculture, Forestry and Fishing - Order I.
 2. Mining and Quarrying - Order II.
 3. Manufacturing - Orders III-XIX.
 4. Construction - Order XX.
 5. Gas, Electricity and Water - Order XXI.
 6. Transport and Communication - Order XXII.
 7. Other Services - Orders XXIII-XXVII.

In 1981 the comparable data was derived as follows:

1. 1980 SIC Classes 01-03.
2. Classes 13, 21, 23
Class 11
Activity 1113
3. Classes 12, 14, 15, 22, 24-26, 31-37, 41-48
Class 11
Activity 1115
Class 49
Groups 491, 492, 494, 495
4. Class 50
Class 11
Activity 1114
Class 84
Group 842
5. Classes 16, 17
6. Classes 71, 72, 74-77, 79
Class 84
Group 848
Class 93
Group 936
7. Classes 61-67, 81-83, 85, 91, 92, 94-99, 00
Class 49
Group 493
Class 84
Groups 841, 843, 846, 849
Class 93
Groups 931-933

The information necessary for this reconcilliation to be made is contained in "Standard Industrial Classification Revised 1980: Reconcilliation with Standard Industrial Classification 1968", Central Statistical Office, 30th June 1980. The additional data necessary is contained in the unpublished version of Table 13 of the 1981 Census of Economic Activity returns (DT's 5069 U and 5070 U) held by the Office of Population Censuses and Surveys.

Certain, minor irreconcilable differences do remain, however, between the compressed 1971 SIC and its equivalent for 1981. This was due to certain Activity headings (the smallest unit of enumeration) comprising previous MLH's which overlap two of the seven categories of the reduced classification used in the text (RC's 1-7). These were:

1. A National Coal Board mining research establishment placed in Activity 1113 (RC 2). Formerly in MLH 876 (RC 7).
2. Processed and macadam coated limestone, dolomite and granite and sand and gravel coated macadam in Activity 2450 (RC 3). Formerly in MLH's 102 and 103 (RC 2).
3. Wholesale slaughtering of animals for human consumption and their subsequent processing in the slaughterhouse in Activity 2450 (RC 3). Formerly in MLH 810 (RC 7).
4. Animal by-products from knackers e.g. hooves, hides and unrendered and crude fat in Activity 4126 (RC 3). Formerly in MLH 899 (RC 7).
5. Small bakehouses attached to retail shops only in Activity 4196 (RC 3). Formerly in MLH 820 (RC 7).
6. Customs agents in Activity 7700 (RC 6). Formerly in MLH 865 (RC 7).
7. Railway vehicle hire and perambulator hiring in Activity 8480 (RC 6). Formerly in MLH's 832 and 821 respectively (RC 7).
8. School crossing patrols in Activity 9130 (RC 7). Formerly in MLH 709 (RC 6).
9. Colleges for airline pilots in Activity 9330 (RC 7). Formerly in MLH 709 (RC 6).

CHAPTER 5

TIME-SERIES YOUTH UNEMPLOYMENT
1950-1982 : POSSIBLE DETERMINANTS

I. INTRODUCTION

Whilst young people have just been shown to have been losing jobs more or less continuously throughout the post-war period, the development which alerted the public's attention to the fact that there might be a problem in the youth labour market was the tremendous increase in their unemployment in the 1970's. They were not, of course, the only group to suffer the consequences of the deepest British recession since the 1930's; but, rightly or wrongly, their's was the plight which, in many quarters, attracted most concern and clamour for resources to alleviate the perceived malady. The problem, shared with many other Western nations, was not anticipated and the governmental response was a fire-brigade campaign which intensified as the problem worsened rather than petered out.⁽¹⁾

But real progress required an explanation of why the level of youth unemployment increased so dramatically. Unreconstituted Keynesians have, what appears at least to be, a fairly simple explanation, and consequent remedy (Kennedy (1985)); but the initial reaction must be that they are missing something. In consequence, several studies of the behaviour of youth unemployment through time have been undertaken, in this country and elsewhere, although the results show sufficient diversity that one must conclude that the answers are not yet all in. This and the following chapter therefore attempt to shed some new light onto the problem. The next section sets the scene by looking at the behaviour of youth unemployment through time and defining those aspects of it which will form the subject of later analysis. More substantially, Section III builds on the general groundwork undertaken in Chapter 2 and

discusses in detail the likely specific, empirically measurable, influences on the aggregates in question. This is then followed in the next chapter by more detailed data considerations and then estimates of the proposed models.

II. POST WAR BRITISH YOUTH UNEMPLOYMENT

The choice of definition one can adopt in a study of youth unemployment is once again constrained by the available data. The one which has received the most attention, at least in published work, has been of young people aged less than 20. But it is also possible to obtain time-series information on the unemployment of young people aged less than 18. In an attempt to guard against undue concentration on one, fairly limited, set of data it is the present intention to focus on the latter definition, and thereby make use of the extra information that this contains. Because of changes in the definition of the unemployment statistics and the confounding effects of the increased coverage of the job creation measures, now to be discussed in more detail, attention will be focussed on the observation period 1950-1982.

Of necessity, official measures of unemployment are based on some, more or less arbitrary, criterion of enumeration. Up until October 1982 the definition used in Great Britain was based on the physical act of individuals registering as out of work with the relevant government agency. It is now a commonplace that the incentive to register is lower for those not potentially eligible for unemployment benefit, for which registration was a requirement additional to joblessness, and that this particular bias affects

those with the weakest labour market attachment, such as youths and married women, the most.⁽²⁾ But, surrounded by some controversy, the definition was changed in October 1982 to include only those registered and eligible for benefit. Whether the change had any underlying economic logic is not pursued, but its immediate consequence was to reduce the official published count of unemployment.⁽³⁾ The figures before and after this watershed are therefore somewhat inconsistent and this constitutes one of the reasons for terminating the observation period in 1982.

The second reason for not using the most recent observations is based on the caveats that have to be introduced about the unemployment figures because of the increased level of direct government intervention in the labour market. Whilst more or less all groups have been affected in one way or another, the battery of schemes which have had a direct focus on young people began with the Job Creation Programme and Recruitment Subsidiary for School-Leavers in 1975. A worsening labour market situation brought about the steady evolution of these relatively minor measures into the unified Youth Training Scheme, operational from September 1983, which now offers guaranteed 24 month training for unemployed school-leavers. These developments are clearly important, but there appears to be no satisfactory way of taking account of them in aggregate analyses.⁽⁴⁾

Up until March 1974 data was collected on unemployed youngsters aged less than 18 on a monthly basis. But after this date an age analysis of the unemployed stock was only made available bi-annually, commencing in July 1974. The situation improved from January 1978 when the figures were made available quarterly, but the upshot is

that for analytical purposes the fullest information is available by concentrating on the January and July unemployment statistics. These are plotted in Figures 1 and 2, for males and females respectively, from which one can clearly see the dramatic increase in youth unemployment in the mid-1970s which provoked so much interest.

Prior to 1974 the data could be construed as representing a textbook picture of the time series behaviour of an economic magnitude in a system subject to random shocks, although note that the January figures for the 1950's are uniquely low and stable. After 1974 the level of youth unemployment proceeded to rise around ten fold, and has since shown no sign of returning to former levels - even when account is taken of the micro-boom of 1978-79.

The next feature of the statistics which should be noted is their marked seasonality. This is usually put down to the influx of school-leavers onto the market at certain times of the year.⁽⁵⁾ The popular argument is that youth unemployment is higher in July than January because the former is the time when most school-leavers enter the market. However, as shown in Figures 3 and 4, this has only been true since the mid 1960's, and only significantly so since the mid 1970's when school-leaving arrangements began to be relaxed.⁽⁶⁾ Prior to this, the summer exodus from school had its major impact on the unemployment statistics in August. Also January has always represented a local peak in school-leaving - at least in so far as the leavers were not immediately absorbed into employment - and in the 1950's one where the number of unemployed school-leavers exceeded that in July. Furthermore, January has also represented something of a seasonal peak for the unemployment of young people excluding school-leavers.

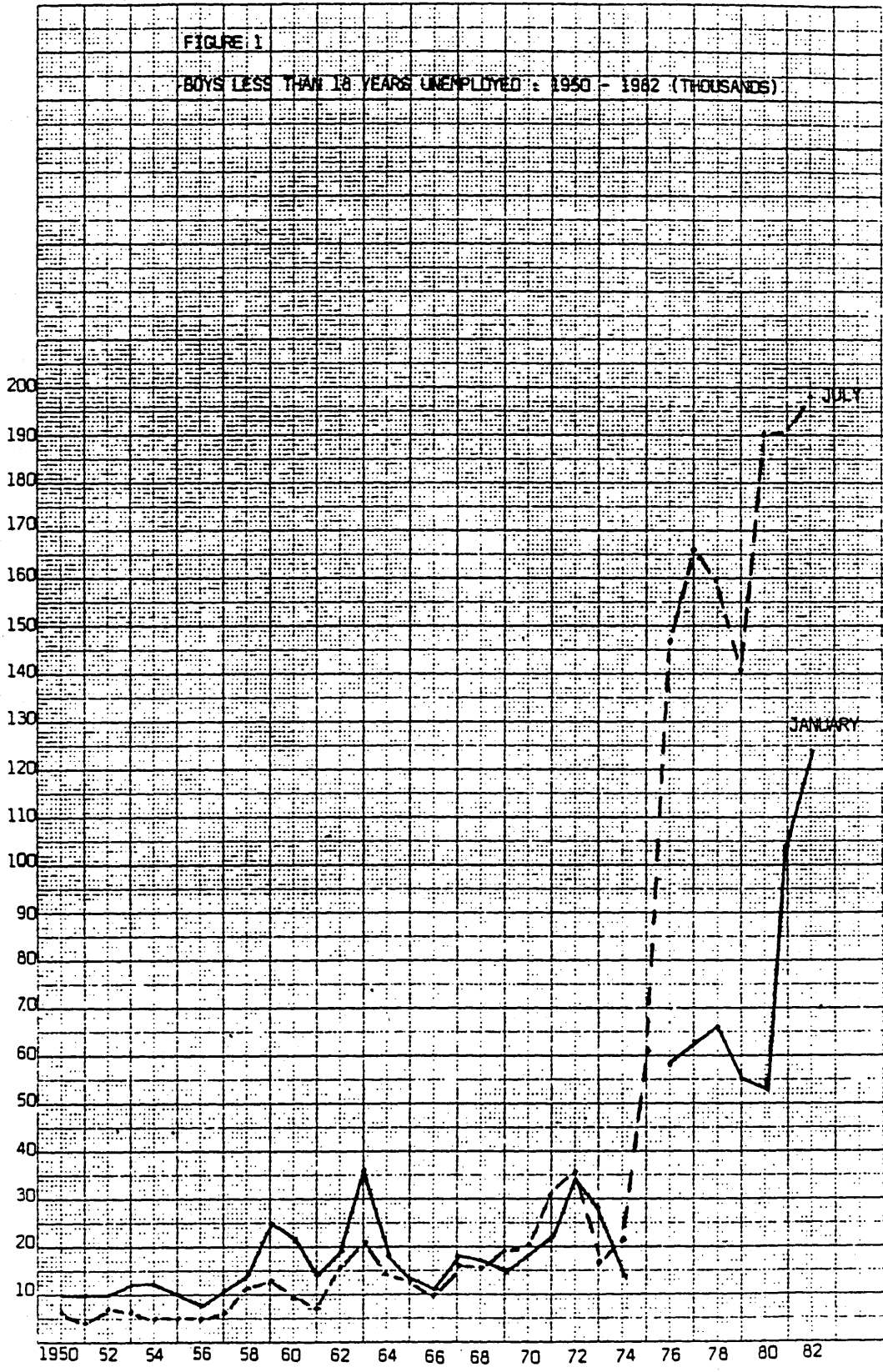
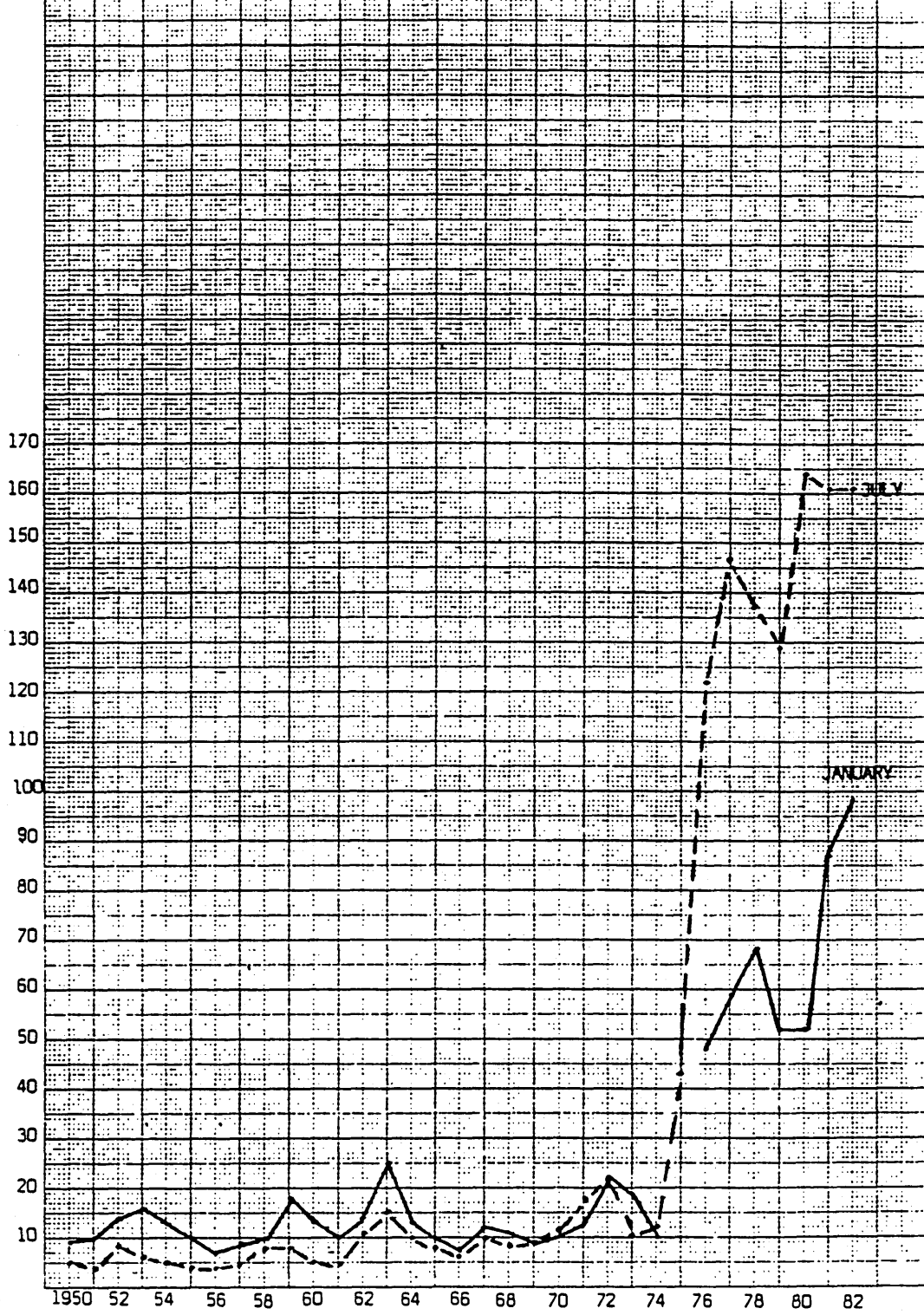
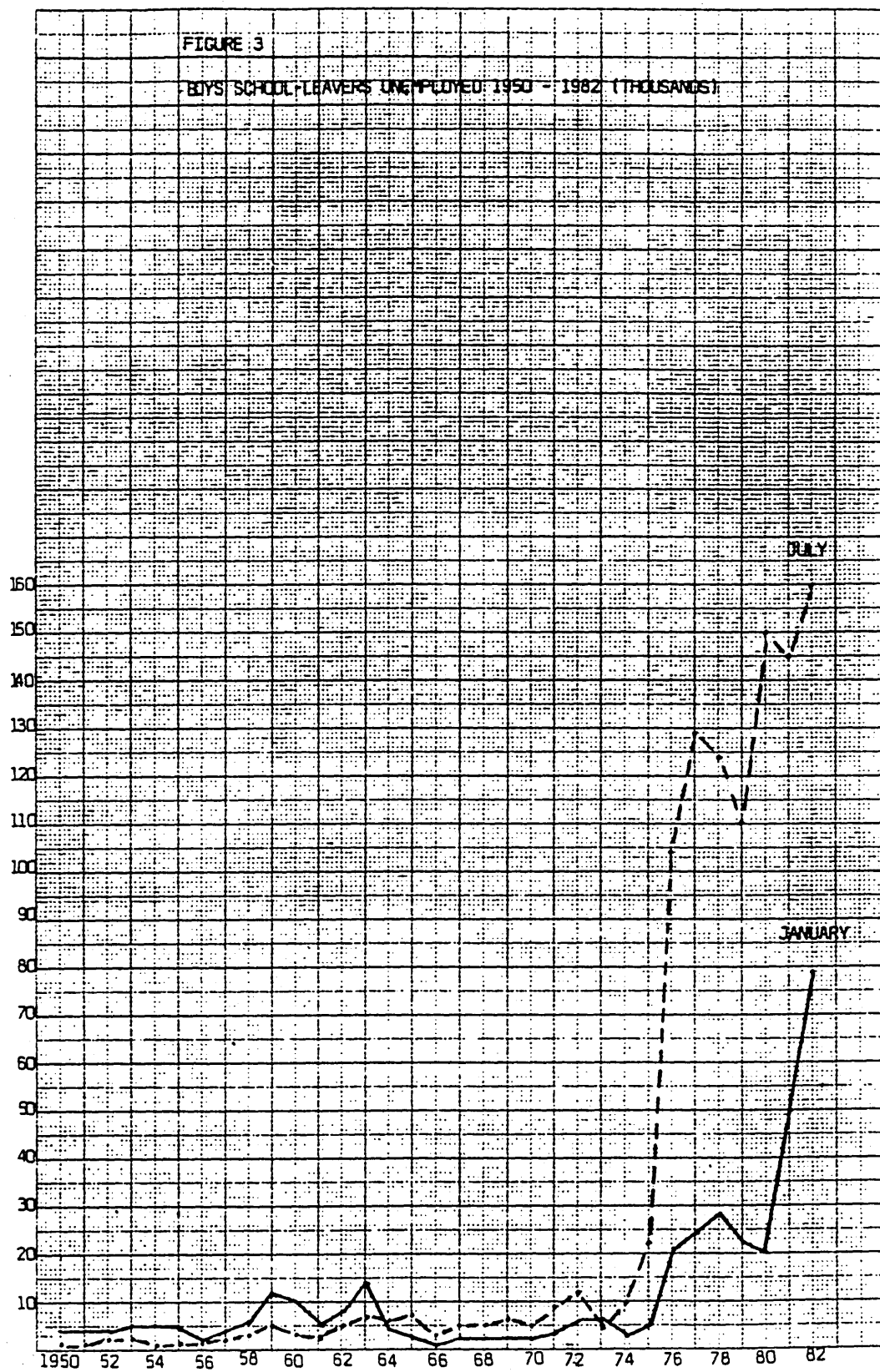
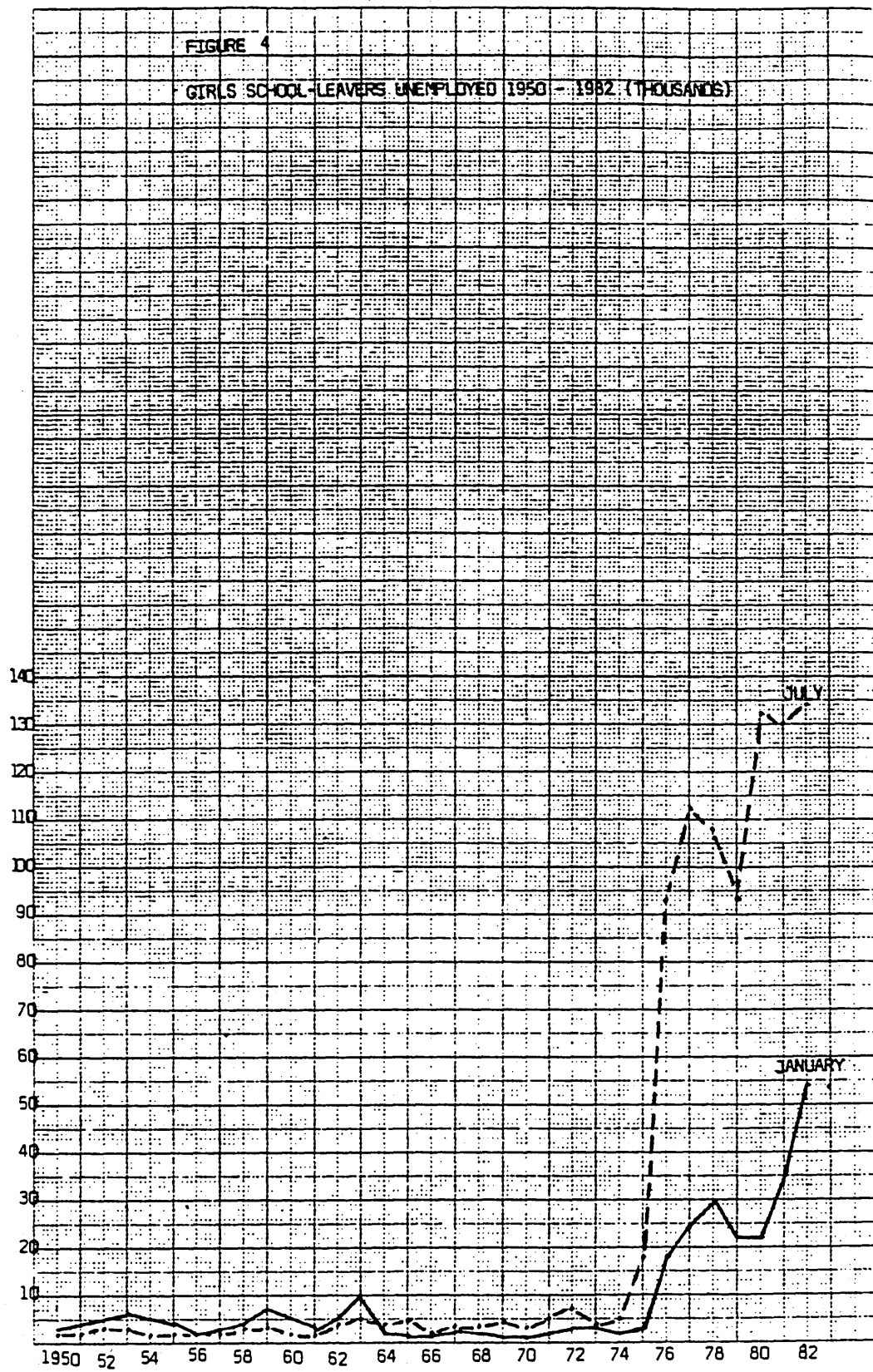


FIGURE 2

GIRLS LESS THAN 18 YEARS UNEMPLOYED 1950 - 1982 (THOUSANDS)







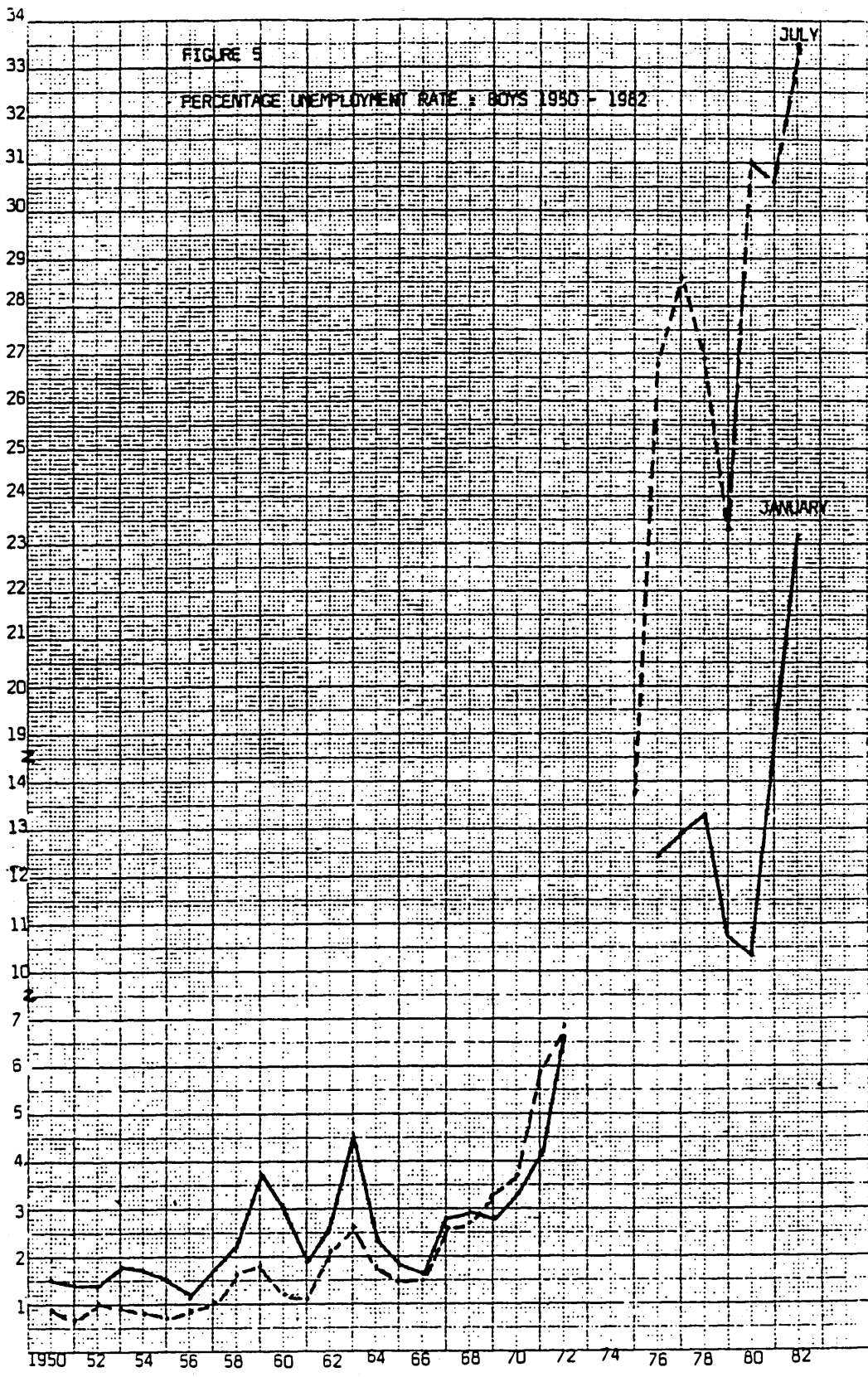
The net result of all this is that analyses of youth unemployment wishing to incorporate most of the post-war period have available only two observations per year. But these are beset by a peculiar mix of switching seasonality problems which it would be infelicitous to argue can satisfactorily be handled if one merges the two series. To reduce, but not eliminate, these difficulties attention in later work will therefore focus on the data for each month taken separately.⁽⁷⁾ Also it is a quite common practice to investigate the figures both including and excluding school-leavers - the group who are responsible for many of the foregoing problems - and this will be done in the two standardisations of this raw data now to be described.

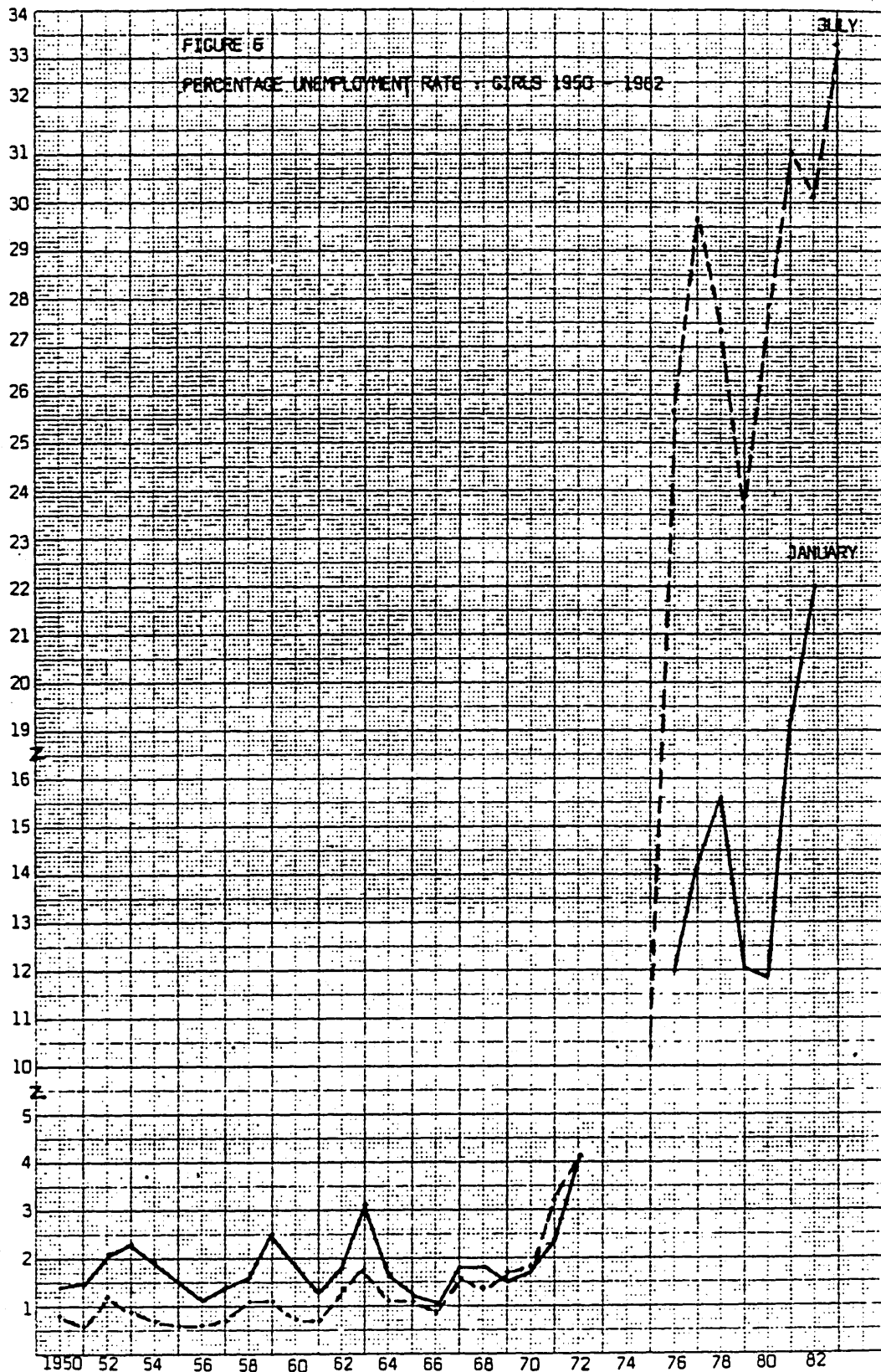
It is clear, however, that these raw unemployment figures do not fully reflect the whole picture regarding the "problem" of youth unemployment. Even if the incidence of unemployment was a random phenomenon, changes in the size of the population at risk in particular groups would change its level amongst them. In short, the raw figures need deflating. If one is using regression techniques this can be achieved by introducing a term on the right hand side measuring the relevant population. But this has not been the strategy adopted in previous studies of British youth unemployment. Ostensibly, the simplest alternative way to achieve the aim is to deflate the unemployment figures directly by the at risk population. In labour market studies it is conventional to define this as the number within the labour force: namely those in work plus those registered as unemployed. By scaling up the derived quotient one arrives at a percentage rate of unemployment for the group in question, and this will form one of the concepts of youth unemployment that will be modelled here.

The four series this generates are depicted in Figures 5 and 6, for males and females respectively. This data, which if youths were homogeneous, would essentially give the probability that any one taken at random were jobless, portrays much the same picture as the raw unemployment figures and will not be commented upon in detail. But note should be made of the difficulty surrounding the possible endogeneity of the labour force deflator and, in the same vein, of the provocative piece by Wachter and Kim (1982) wherein schooling, for instance, is regarded as a (choice) economic activity and, as such, as properly belonging in the denominator.

As the figures indicate, there are discontinuities in the data in the 1970's, for which deficiencies in the youth labour force information are responsible. Up until 1972 the annual national insurance card count provided an age and sex breakdown of the labour force at each mid-year. Thus, accurate unemployment rates could be derived for one or two months of each year, subject to the sampling error of the card count itself, with the accuracy of the estimates for the remaining months depending on the degree of seasonality in the workforce, and on its time-path of change between years. These are, of course, quite important caveats, but it appears that they have received rather greater emphasis in studies of unemployment generally.⁽⁸⁾

Following the cessation of the age delimited labour force count it was not possible to construct percentage unemployment figures for young workers until the Department of Employment began its age-rate unemployment analysis in July 1975.⁽⁹⁾ The effect of this is that the January series has three missing observations and that for July





two.⁽¹⁰⁾ This, of course, represents an additional caveat, as does the fact that the labour force denominator estimates were derived on a different basis for the different portions of the sample.

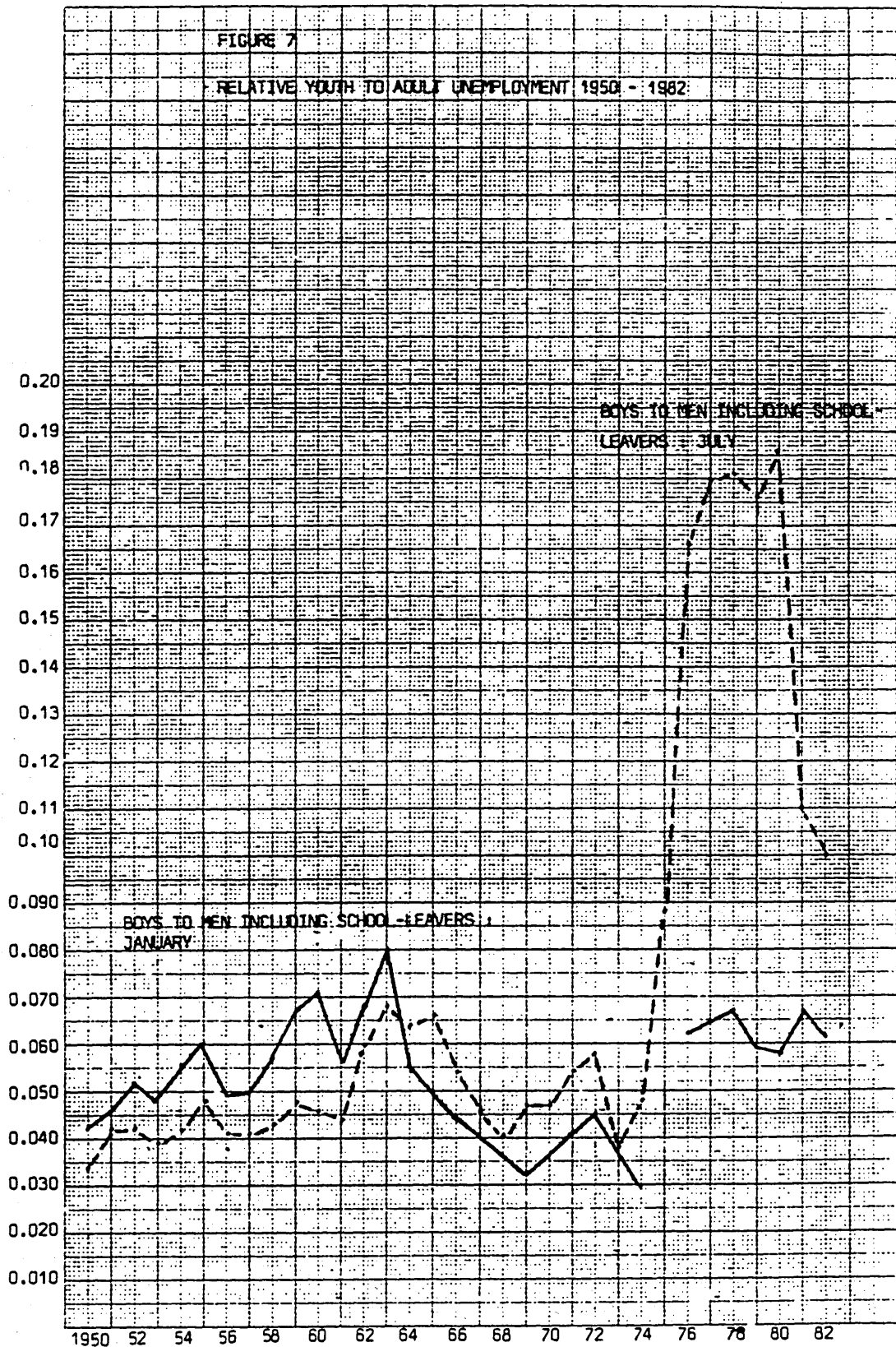
The series display the same sort of seasonality patterns that were encountered with the raw unemployment figures.⁽¹¹⁾ As there, this in part reflects the behaviour of unemployed school-leavers. But it is not strictly possible to conduct this analysis excluding the influence of this group, in spite of the attempts to do so by Makeham (1980). Whilst the definition of the variable he constructs (see *ibid* p.93) is somewhat unclear, it appears that he deducted the number of unemployed school-leavers from both the unemployment numerator and the workforce denominator. This, however, leaves those school-leavers who actually found work in the divisor, which not only introduces measurement bias but does so in a way that is unlikely to be invariant with the cycle, given the usual argument that school-leavers have the most cyclically sensitive employment prospects. As there appears to be no available escape from this problem, the direct examination of a rate of youth unemployment excluding school-leavers must be abandoned.

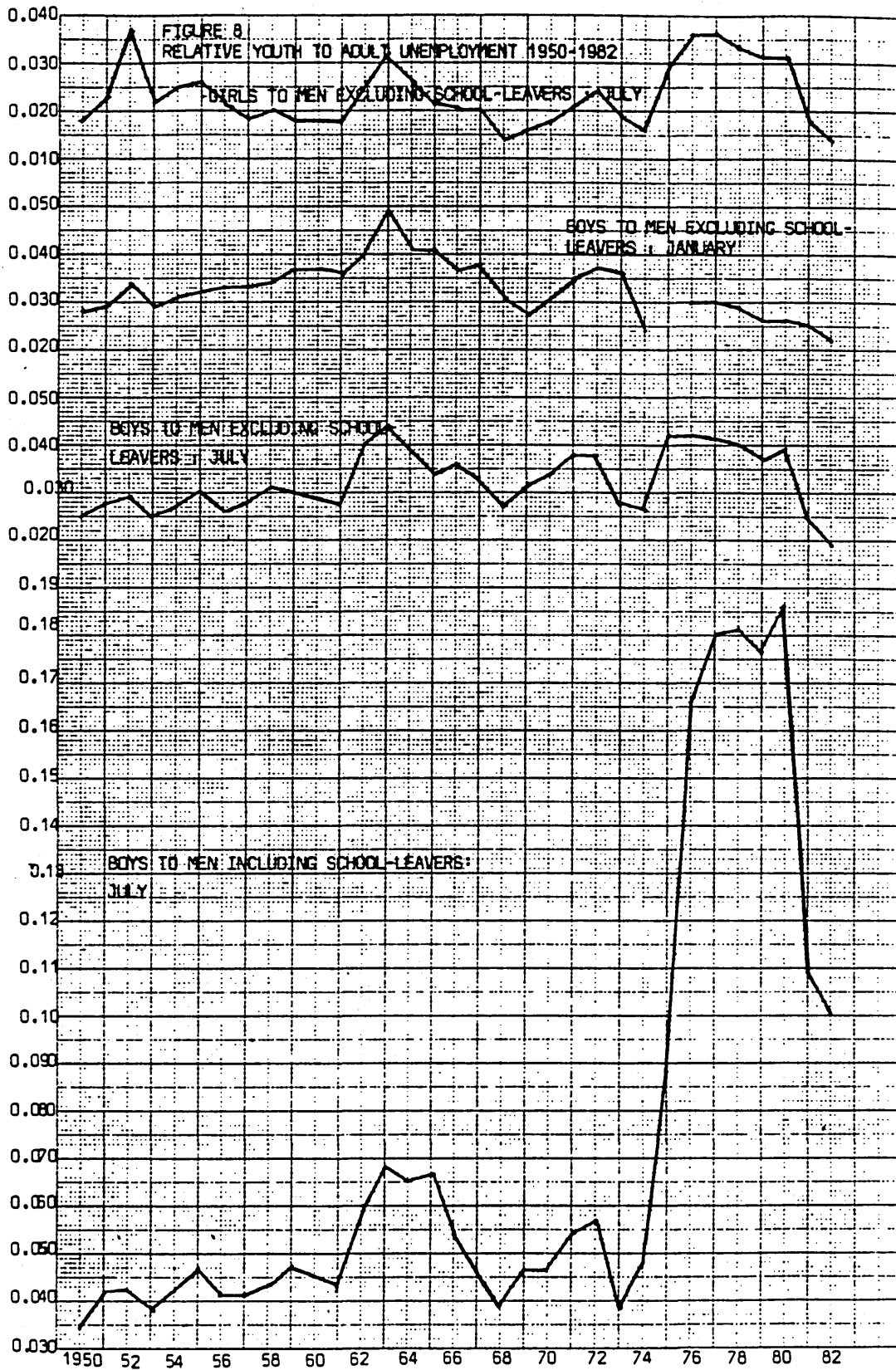
In recognition of the objections that might be raised against the use of the percentage unemployment figures, a second strand of the analysis will focus on the absolute unemployment of youths relative to that of adults.⁽¹²⁾ This amounts to an examination of the distribution of the unemployment burden through time. Owing to the problematic nature of the registered unemployment statistics for older females, researchers often choose to focus their attention on

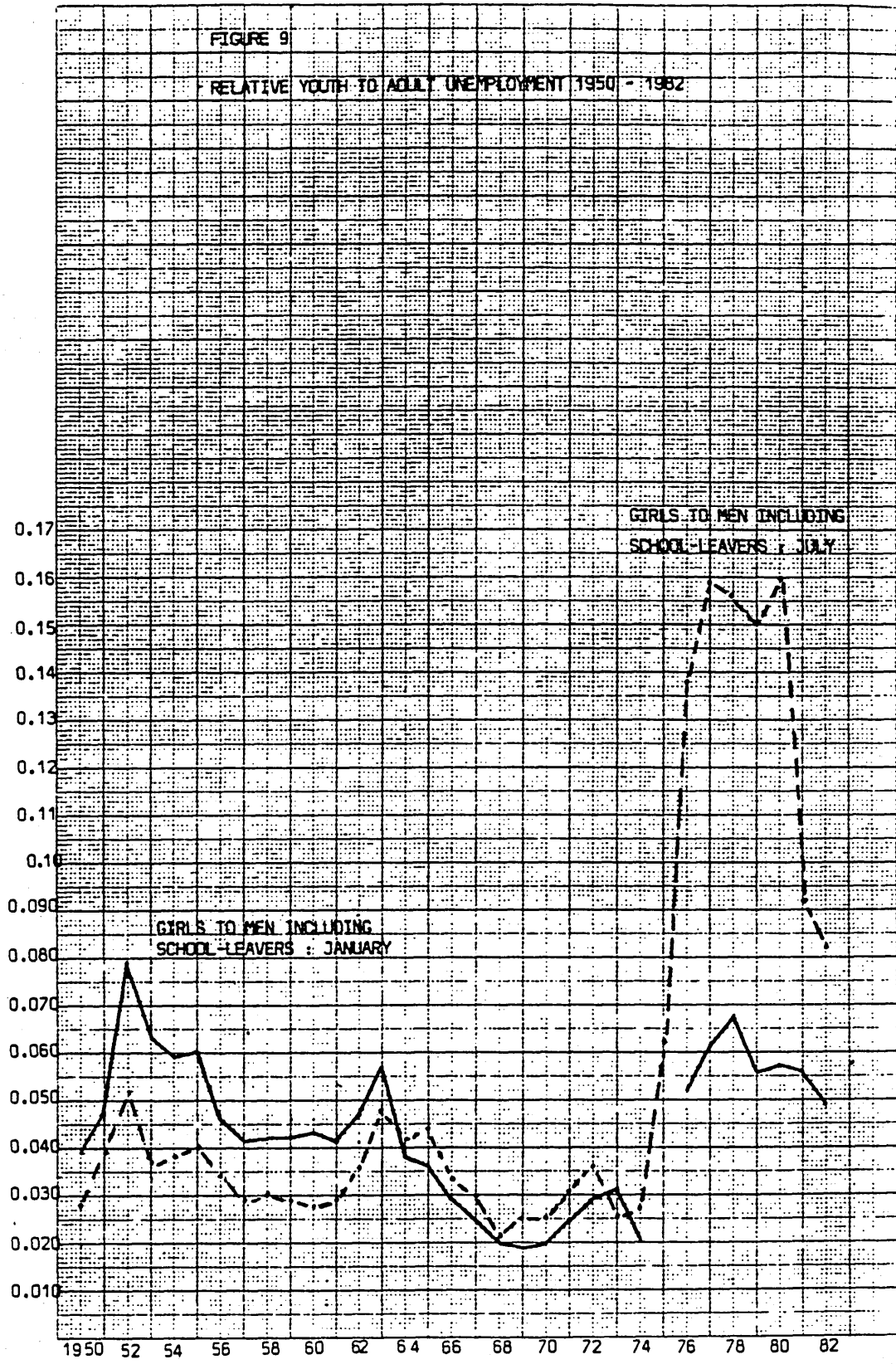
the unemployment behaviour of adult males. But as adult women are but time-dated girls it seems appropriate to model their relative unemployment in addition to that of youths of both sexes relative to older males.

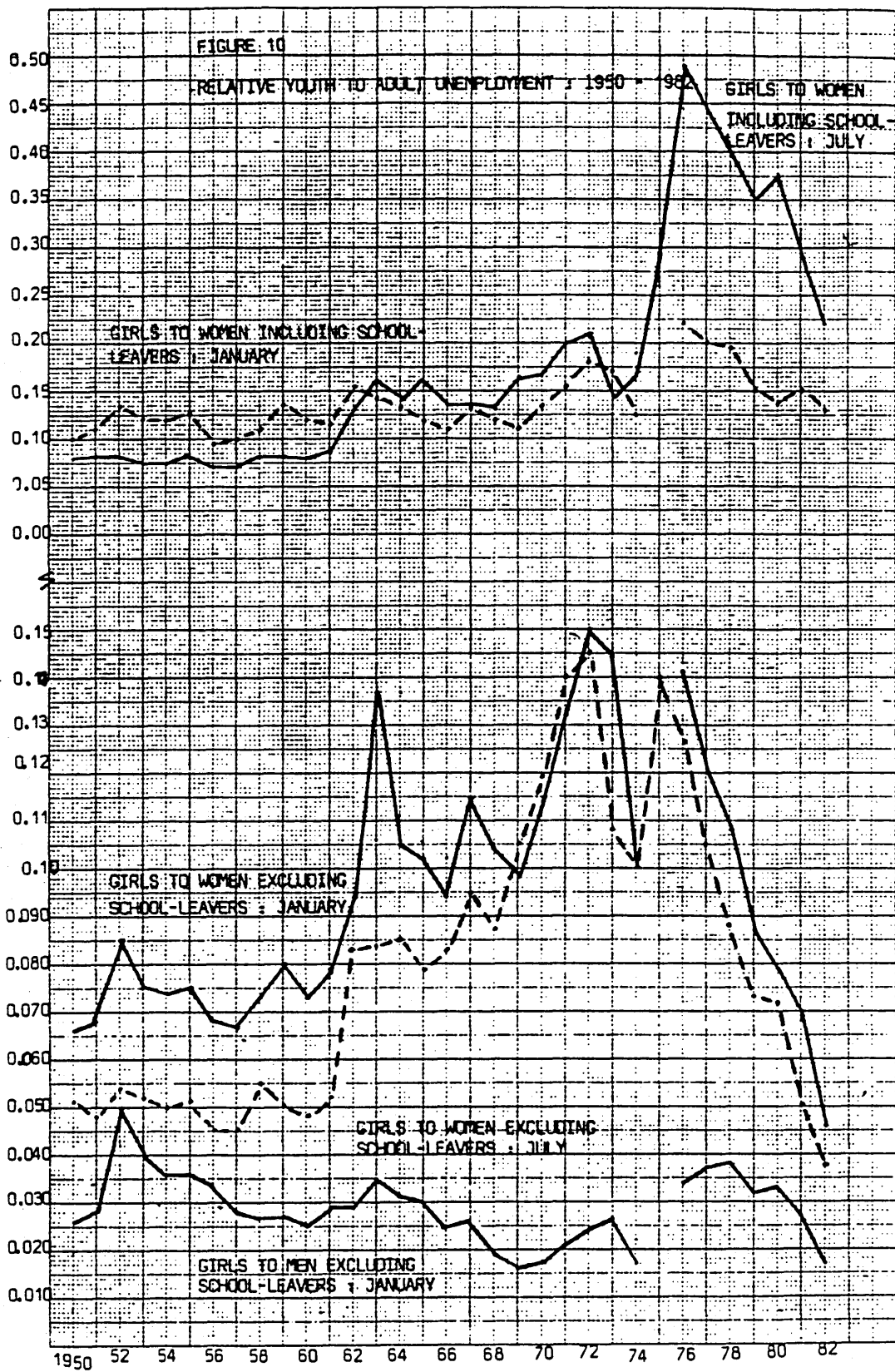
Using this absolute data on the age composition of the unemployed stock does allow one to see whether school-leavers appear to have a serious influence on the results of the modelling exercise. Thus one is able to measure the numerator both including and excluding school-leavers, and this will be done for both the January and July months. The resulting twelve unemployment ratios are plotted in Figures 7-10, and clearly provide a different perspective to the youth unemployment problem.

Those charting that of young relative to older males are presented in Figures 7 and 8, and it is readily apparent that there is a good deal of variation to be explained. But perhaps most interesting is the situation from 1974 onwards. When school-leavers are included the ratios rise rapidly up to 1977, level off and then proceed to fall quite sharply. But the same pattern is not found in the figures which exclude school-leavers. Thus whilst there was some increase in 1974, it was not nearly so dramatic as that above, and levelled off after one year in the case of the January observations whilst those for July began to decline beyond 1975, and achieved their lowest ever level in 1982. Those looking at the relationship between the unemployment of girls and adult men including school-leavers are given in Figure 9 and they look very similar to the equivalent figures using young males in the numerator, except that they do not rise to quite such a high peak. When school-leavers are excluded (Figures 8 and 10) one again sees the early cyclical pattern









but, after the initial increase in the mid 1970's, both the observations for January and July decline quite markedly to the end of the data period. Finally, looking at the data for girls relative to older women, given in Figure 10, all display considerable volatility, especially when school-leavers are excluded. But all share the common feature that they declined markedly in the last few years of the observation period. It is tempting to venture that this evidence is consistent with the various job creation measures having worked to the comparative benefit of younger workers. But the data could also be consistent with various other hypotheses and it seems wisest to reserve judgement on this issue, at least when using the present data set. However, before ending this summary description, one further startling observation should be made. This is that, when school-leavers are included, half of the recorded stock of unemployed females in 1976 was under 18 years of age. This is a particularly stark reminder of the importance of the problem at hand.

Before going on to propose a model for explaining the above noted movements in youth unemployment it should be noted that one can, in principle, exclude school-leavers from the analysis without having to argue that they form a "non-competing group" (Cairnes (1874), Mill (1909)) with other youths, provided that in a single equation framework a true reduced form is modelled.⁽¹³⁾ However, ideally simultaneous estimation of the appropriate structural forms would be the goal, but the identification problems appear to be immense.⁽¹⁴⁾ Nevertheless, the issue of simultaneity is returned to, albeit in a slightly different form, in the following chapter.

III. THE DETERMINANTS OF YOUTH UNEMPLOYMENT

This section aims to establish the most important likely influences on the aggregate rate of youth unemployment and on the absolute total of their unemployment relative to that of adults. Where these different measures demand alternative definitions of the explanatory variables, or where the interpretation of their meaning differs, this will be signalled as the discussion proceeds. As the estimation methodology will, at least initially, be reduced form, the ensuing discussion will not be a sequential one of demand and supply influences; although, of course, these will be considered under each individual heading. The cycle will be considered first, as young people are often considered to be one of the groups most sensitive to its vicissitudes. Also some discussion of the potential effects of the 1960's "shake-out" of labour will be undertaken at this stage. This will be followed by a consideration of the importance of youth wages on their labour market prospects, which follows on from the work of Chapter 3. Most early work on unemployment, and certain latter day pieces, focussed on its structural component; that is, the distribution of workers throughout the sectors of the economy which exhibit differential rates of growth. This therefore constitutes the next influence on youth unemployment to be examined. Following this, the role of labour supply in the determination of unemployment is considered. Then the controversial influence of unemployment benefit is further considered, following on from the preamble in Chapter 2. Female labour force participation is the last substantial topic covered, with a brief discussion of various possible shifts and trends in youth unemployment relationships closing the section.

The chapter itself concludes with a summary of the principal conclusions in preparation for the estimation to be undertaken in the next chapter.

III.i THE CYCLE

That the fortunes of youth, or any other group, in the labour market are related to the stage of the cycle is a commonplace notion.

Hansen, for instance, wrote

"Wesley Mitchell, in his *Business Cycles : The Problem and Its Setting* (1927) defined business cycles as a fluctuation in aggregate economic activity. The most all-inclusive manifestation of aggregate economic activity is the real income, or output, of a nation. Closely related thereto is the volume of employment."

(Hansen (1964) p.4)

Equally, in a micro-theoretic setting, if firms are output constrained with capital fixed in the short run, then

$$(1) \quad Q = f(L)$$

implies

$$(1a) \quad L = f^{-1}(Q)$$

where Q is the level of output and L the labour input.⁽¹⁵⁾ Thus one frequently sees functional relationships posited between labour and output which appear to support the above definition of the cycle. But related research in this area should alert one to proceed with caution. First of all, equations (1) are entirely technological and reveal nothing in themselves of the actual behaviour of firms. Indeed there is now a large literature, inspired on the empirical level by the works of Ball and St Cyr (1966), Brechling (1965) and Kuh (1965),

which suggest that the technologically efficient level of employment will rationally often not prevail.⁽¹⁶⁾ The reason is simply the existence of adjustment costs preventing firms actually achieving ultimately desired (i.e. minimum) levels of employment in the short-run.⁽¹⁷⁾ This would appear to render the level of employment, or its rate of change, a potentially misleading proxy for the cycle, particularly at plateaus or valleys of demand when employment may still be adjusting.

But the literature on youth unemployment, both in Britain and the United States, uses an adult unemployment rate as "a cyclical aggregate demand variable" (Wachter and Kim (1982)). For instance, as well as the source cited, Makeham (1980), Lynch and Richardson (1982) and Freeman (1982) use such a measure in unemployment studies, whilst Clark and Summers (1982) use one to explain youth transition probabilities and Meyer and Wise (1982) adopt the same approach in a study of the weeks worked by youths.

This practice is open to certain possible objections, particularly in a British context. In the first place, if an unemployment measure is to be used as a cyclical indicator it should presumably be one relating solely to groups with more or less total labour force attachment and registration propensity to guard against hidden unemployment and discouraged worker effects. All of the American studies appear to do this by selecting an unemployment rate for prime age males, usually quite narrowly defined. British studies, however, have tended to use adult female unemployment as the cyclical indicator when examining female youth unemployment. A partial defence might be the degree of segregation between males and females.⁽¹⁸⁾ However, legislative changes affecting womens' propensity to register,

principally the Social Security Pensions Act 1975 (see Elias (1980)), cast further doubts on the consistency through time of this figure as a measure of economic activity.⁽¹⁹⁾

However, even if the prime age male unemployment rate were chosen, there has been at least one sharp break in its relationship to output in the post-war period. This, of course, refers to the much researched "shake-out" of labour around 1966-68. Then the passage of the Redundancy Payments Act (1964) and the National Insurance Act (1966) appear to have prompted employers to reduce the extent to which they hoarded labour (Taylor (1970), (1972), Mackay (1972), Foster (1974)).⁽²⁰⁾ Thus the adult male unemployment figures seem likely to suffer from time series inconsistency and therefore to be, at best, a dubious proxy for aggregate demand.

This is not, however, to say that the relationship between youth and adult unemployment is of no potential interest in itself. One might indeed, in certain circumstances, be interested in the historical relationship between adult male unemployment and the unemployment of young workers. The policy problem here is whether the determinants of the adult unemployment measure are sufficiently well known, and the relationship between group unemployment rates sufficiently stable, for the answer to be useful.⁽²¹⁾

But side-stepping these problems for the moment, what are the apparent simple relationships between the unemployment rates of youths and those of older males (defined as 18 plus)? This was essentially the relationship examined in the early Feldstein (1973) paper which, although not wholly satisfactory (see, for example, the discussants

comments attached to that work), will provide a useful reference point and springboard to later discussion.

Table 1 below presents the results obtained from regressing the unemployment rates of male and female youths (including school-leavers) on the unemployment rates of adults of both sexes separately at January and July for the period for which the relevant data is available, namely January and July for the period for which the relevant data is available, namely January 1950 - July 1972 (inclusive) and July 1975 - July 1982 (inclusive).⁽²²⁾ Whilst the unemployment behaviour of adult females has in general been regarded as a rather unreliable statistic due to changes in national insurance regulations etc. it is, at this stage, included for the sake of completeness.

By the usual statistical criteria the equations appear to work reasonably well. In particular, whether adult male or adult female unemployment is used, the coefficient is of the correct sign and highly significant in all equations. In addition, the overall fit of the equations modelling the unemployment rate of young males is reasonable. Furthermore, in only the first equation does the DW statistic achieve a value which might suggest the possibility of (negative) serial correlation with two independent variables.

In analyses such as this, the magnitude of the coefficient on the "true" explanatory variable acquires some significance. In particular, under the assumption that both youth and adult unemployment are subject to the same influences, one is interested in which is the more sensitive to the underlying forces. At its simplest this reduces to whether the coefficient on adult unemployment differs from unity.

TABLE I
OLS ESTIMATES

	CONSTANT	PERCENT ADULT MALES UNEMPLOYED	PERCENT ADULT FEMALES UNEMPLOYED	\bar{R}^2	D.W.
PERCENT BOYS UNEMPLOYED	-2.189 (2.5)	2.450 (13.7)		0.76	2.70
PERCENT BOYS UNEMPLOYED	-1.741 (1.8)		4.359 (12.2)	0.71	1.98
PERCENT GIRLS UNEMPLOYED	-2.962 (1.1)	2.966 (5.6)		0.33	1.82
PERCENT GIRLS UNEMPLOYED	-1.564 (0.6)		4.847 (4.7)	0.26	1.64

T-STATISTICS IN PARENTHESES

In the current instance they appear to be implausibly large, particularly when adult female unemployment is used as the dependent variable. Thus whilst one might reasonably expect teenage unemployment to be more cyclically sensitive than that of adults, one must express surprise at coefficients indicating that it is between 2.5 and 5 times as sensitive, as do those in the table. Indeed, concentrating on only the first equation, the coefficient on adult male unemployment therein is some 69 per cent larger than that achieved on American data reported by Feldstein (1973) for the period 1954-1972, using basically the same model. It is also larger than that reported by Makeham (1980) when he regressed the unemployment of males aged less than 20 (excluding school-leavers) on the total adult unemployment rate (Table A5 p.97) for the period 1959-1976 in Great Britain. However, the coefficient there of 2.3 is also rather large. Intuitively it seems reasonable to assert that omitted variables are introducing bias into the results, both here and in the comparisons cited. But before going on to develop the model in full it is of interest to consider two simple extensions to this very basic framework which help to highlight this omitted variable bias.

The first of these is to introduce a time trend to account for, at least some of, the influences which have been ignored. As can be seen from the results given in Table 2, not only is this positive, and significant in the equations using adult female unemployment, it also serves to reduce the magnitude of the coefficient on the cyclical indicator. Even without any further reasoning as to the contents of the vector of youth unemployment determinants, such a result should serve to issue caution regarding the estimates obtained from the very simple analysis.

TABLE 2
OLS ESTIMATES

	CONSTANT	PERCENT ADULT MALES UNEMPLOYED	PERCENT ADULT FEMALES UNEMPLOYED	t	\bar{R}^2	D.W.
PERCENT BOYS UNEMPLOYED	-3.657 (3.0)	1.987 (6.2)		0.083 (1.7)	0.77	2.67
PERCENT BOYS UNEMPLOYED	-5.592 (5.3)		2.975 (7.6)	0.193 (5.4)	0.80	2.83
PERCENT GIRLS UNEMPLOYED	-5.413 (1.5)	2.194 (2.3)		0.156 (1.0)	0.36	1.86
PERCENT GIRLS UNEMPLOYED	-7.599 (2.1)		2.678 (2.0)	0.302 (2.5)	0.32	1.83

T-STATISTICS IN PARENTHESES

Secondly, in the light of the debate concerning the shake-out of labour in the mid to late 1960's, it was decided to examine, in a preliminary manner, whether this had an apparent long-term effect on the distribution of unemployment between young and older workers. For the present, although the issue will be taken up in more detail in the following chapter, this is done via the medium of three alternative dummy variables, on account of the difficulty of precisely dating the event of interest. These are defined as

D1 = 0	1950-1965
= 1	1966-1982
D2 = 0	1950-1966
= 1	1967-1982
D3 = 0	1950-1967
= 1	1968-1982

and the results from including each in turn, along with each of the adult unemployment measures, as independent variables are presented in Table 3.

Whilst the measures are not significant when the adult male unemployment rate is used as the cyclical indicator, they are consistently positive and do achieve significance when entered in conjunction with the female unemployment rate. This is not yet being treated as evidence of some shake-out effect on the distribution of unemployment, although it will be invoked as the justification or further enquiry in later work. But one should note how, once again, the inclusion of an additional variable in the above simple

TABLE 3
OLS ESTIMATES

	CONSTANT	PERCENT ADULT MALES UNEMPLOYED	PERCENT ADULT FEMALES UNEMPLOYED	D1	D2	D3	\bar{R}^2	D.W.
PERCENT BOYS UNEMPLOYED	-2.255 (2.5)	2.379 (9.9)		0.690 (0.4)			0.75	2.67
PERCENT BOYS UNEMPLOYED	-2.221 (2.5)	2.359 (9.2)			0.837 (0.5)		0.75	2.66
PERCENT BOYS UNEMPLOYED	-2.180 (2.5)	2.285 (8.6)				1.477 (0.8)	0.76	2.66
PERCENT BOYS UNEMPLOYED	-2.954 (8.3)		3.717 (10.7)	5.233 (4.2)			0.78	2.56
PERCENT BOYS UNEMPLOYED	-2.700 (3.2)		3.601 (10.1)		5.569 (4.4)		0.78	2.60

Continued

TABLE 3 (Continued)

	CONSTANT	PERCENT ADULT MALES UNEMPLOYED	PERCENT ADULT FEMALES UNEMPLOYED	D1	D2	D3	R ²	D.W.
PERCENT BOYS UNEMPLOYED	-2.463 (3.0)		3.480 (9.6)			6.023 (4.6)	0.79	2.67
PERCENT GIRLS UNEMPLOYED	-3.190 (1.2)	2.721 (3.8)		2.401 (0.5)			0.33	1.83
PERCENT GIRLS UNEMPLOYED	-3.074 (1.2)	2.643 (3.5)			3.00 (0.6)		0.33	1.84
PERCENT GIRLS UNEMPLOYED	-2.935 (1.2)	2.482 (3.1)				4.325 (0.8)	0.33	1.85
PERCENT GIRLS UNEMPLOYED	-3.471 (1.2)		3.838 (3.5)	8.231 (2.1)			0.30	1.78

Continued

TABLE 3 (Continued)

	CONSTANT	PERCENT ADULT MALES UNEMPLOYED	PERCENT ADULT FEMALES UNEMPLOYED	D1	D2	D3	\bar{R}^2	D.W.
PERCENT GIRLS UNEMPLOYED	-3.109 (1.1)		3.625 (3.2)		8.977 (2.2)		0.31	1.79
PERCENT GIRLS UNEMPLOYED	-2.763 (1.0)		3.386 (2.9)			10.010 (2.4)	0.32	1.82

T-STATISTICS IN PARENTHESES

regression exercise that is positively correlated with the rates of adult unemployment served to reduce the size of the coefficient on this latter regressor - even when the additional variable was not itself significant.

Whilst simple exercises such as this may be interesting and indicative, certain issues ultimately have to be recognised and, lest the wrong impression be given, was so by Feldstein (1973) himself. This is that many other influences will affect the level of youth unemployment and excluding them from regression equations such as those above will in general introduce bias into estimated relationships, as was suggested by the exercises already performed. What these other influences may be will form the heart of the rest of the chapter.

The second problem with this type of analysis has, however, apparently received no attention in the literature. This is that the unemployment of all groups will, at least on the demand side, be determined simultaneously. As such, the adult male unemployment rate has no role on the right hand side of an equation explaining youth unemployment. On this one should note the observation made by Hazeldine when discussing the formulation of employment functions that

"This is not just a matter of simultaneous equation bias - of including as predetermined in one equation a variable which is endogenous elsewhere in the system. The point is that the demand for two variable inputs is jointly determined by the same economic agents - employers - so that it makes no sense to include one as a predetermined variable in the equation explaining the demand for the other."

(Hazeldine (1979a) footnote 9 p.156, italics in original)

As a simple demonstration of this, consider a firm wishing to minimise the cost

$$(1) \quad C = w_A A + w_Y Y$$

of producing an output Q under the constraint of a simple Cobb-Douglas production function

$$(2) \quad Q = A^\alpha Y^\beta$$

where A and Y are the two variable factors of production and w_A , and w_Y are their respective prices. The first order conditions for this problem yield the relation

$$(3) \quad \frac{Y}{A} = \frac{\beta}{\alpha} \frac{w_A}{w_Y}$$

That is, factor usage is determined simultaneously. Only when (3) is substituted into (2) does one get factor demand functions viz:

$$(4) \quad Y = Q^{\frac{1}{\alpha+\beta}} \left(\frac{\alpha}{\beta} \frac{w_Y}{w_A} \right)^{\frac{1}{\alpha(\alpha+\beta)}}$$

$$(5) \quad A = Q^{\frac{1}{\alpha+\beta}} \left(\frac{-\beta}{\alpha} \frac{w_Y}{w_A} \right)^{\frac{1}{\beta(\alpha+\beta)}}$$

Unique factor demand functions depend on the level of output, whilst their ratio depends on relative factor prices and technological parameters. If factor supplies are given, this has the further implication that the determination of the unemployment of A and B will

also be simultaneous. For this reason, and because there are doubts about the efficiency of any unemployment measure as a cyclical indicator, the remainder of the time series analysis will utilise the annual index of GDP as the prime cyclical indicator.⁽²³⁾

Even then, however, one should be aware of various limitations with the simple approach of using current output in a current unemployment equation. Firstly, if adjustment costs are important to firms' employment decision-making then it is likely that expected future output levels will influence their behaviour. For instance, in the face of adjustment costs, a fall in demand that is expected to last for only one period will affect firms differently from a fall that is expected to be sustained. Secondly, when firms can hold buffer stocks, or orders, output need not be synonymous with demand. Then variables such as sales (as in Nadiri and Rosen (1973)) or new orders (as in Hazeldine (1979b)) may be better cyclical indicators.⁽²⁴⁾ Only very limited attempts will be made to cover the first point, in that very simple output lags will be used to attempt to proxy an expectations formation mechanism, and no further comment will be made on the second.

The obvious, *cet. par.*, hypothesis is that youth unemployment will be negatively related to the level of output and, given the presumption that they embody little human capital, one would expect the reaction to be more or less immediate. However, a certain amount of care may be called for here.

More or less implicitly, the time series youth unemployment work undertaken to date has imposed the assumption of a constant technology. This, however, is clearly unrealistic. Furthermore, to

the extent that technological change manifests itself in increased labour productivity, one would not expect to observe the simple linear relationship between output and unemployment that is hypothesised above. Therefore, under the simplifying assumption that labour productivity advances steadily, the percentage change of GDP from year $t-1$ to t should negatively affect youth unemployment.⁽²⁵⁾ That is, the larger the percentage increase in output, the more it should reflect genuine labour demand increases.

The foregoing relates to analyses of youth unemployment in isolation. In addition to this, however, interest will also focus on the unemployment of youths relative to adults, and one must ask how the chosen cyclical indicators will a priori affect these variables. Continuing in the vein begun above, young people are likely to embody less firm specific human capital than are older workers and therefore one would expect employers to be both relatively more willing to dispense with their services as output turns down, and more willing to engage them as output shows signs of increasing.⁽²⁶⁾ Furthermore, it is normally assumed that youths' quit propensities are greater than those of adults, and one might also expect them to be less cyclically volatile. The higher quit propensity itself might be rationalised on the grounds that, being younger, youths have longer horizons and therefore potentially more to gain from a job change, although this is an empirical matter.⁽²⁷⁾ Also young people are normally seen as passing through an induction phase in the labour market, with job experimentation as part of the natural order.⁽²⁸⁾ In support of the contention that youth quit behaviour may be less sensitive to the cycle, one might argue that they are relatively ill-informed about the

impact of fluctuations in the macro-economy on job openings outside their current firm. All this adds a supply side argument to those previously presented for expecting young peoples' unemployment to be more sensitive to the cycle than that of older workers. That is, the ratio of youth to adult unemployment should behave counter-cyclically.

III.ii WAGES

In the perfectly general case, if a producer is aiming to minimise the cost

$$C = w_1 x_1 + w_2 x_2 + \dots + w_n x_n$$

where C is total cost, the w_i ($i = 1 \dots n$) a vector of unit input costs and the x_i ($i = 1 \dots n$) a vector of variable factor inputs of producing a fixed output, \bar{Q} , where

$$\bar{Q} = f(x_1, x_2, \dots, x_n)$$

then

$$x_i = g_i(\bar{Q}, w_1, w_2, \dots, w_n) \quad (i = 1 \dots n)$$

will be the demand function for the i^{th} input. ⁽²⁹⁾ It is only in particular specifications of the production function, such as the Cobb-Douglas or CES, that relative wages are the appropriate measures to adopt. ⁽³⁰⁾ This point is worth remembering when examining the work

of Wells (1983) on youth unemployment.⁽³¹⁾ Furthermore, whilst own wage elasticities must necessarily be non-positive, cross wage elasticities in the general case, with more than two variable factors, are not sign constrained (see Hicks (1946) Chapters 3 and 7).⁽³²⁾

Given the available data on time-series wage movements, discussed in detail in Chapter 3, one is constrained to make the assumption that, considering only labour, the variable factors are those age-sex groups delimited in the October Earnings and Hours Inquiry. Including part-time females this therefore gives a total of five inputs.⁽³³⁾ Empirical considerations intervene, however, to dictate that all groups can only be considered when the relative earnings formulation is adopted due to the extremely high correlation that exists (0.9+) between absolute real earnings movements. This arises from the general upward trends in the series, the common elements of which are removed when they are considered in ratio form thereby allowing more weight to be afforded to short-run developments. This means that two basic alternative simplifications are available for consideration : one using only the real earnings of the youth group under study, the other using some elements of the relative earnings vector which is available.

Percentage youth unemployment rates should be positively related to the level of their own real wage. Also, at least one relative wage variable with that groups earnings in the numerator should be so signed in the alternative specification, reflecting the fact that each variable factor theoretically possesses at least one price into quantity substitute (Hicks (1970)).⁽³⁴⁾ But matters are even less clear cut when considering the relative unemployment equations. Then

the groups forming the dependent variable may, in principle, be either substitutes or complements. Furthermore, it is not even possible to specify in what form the wages of other groups should be entered from general considerations and no a priori expectation of direction of influence would be possible due to the many possible patterns of substitutability and complementarity. In the light of this only the wage relatives of the two groups in question will be considered in these equations.

Whilst the foregoing raises certain issues which are often ignored in the unemployment literature it is, of course, incomplete. In the first place the analysis is based solely on demand considerations. As such the argument is only strictly valid when excess supply prevails, labour possesses no degree of quasi-fixity and all discharges enter registered unemployment. Only the first of these is developed further at this point, the second having received some attention in the earlier discussion of labour contracts and the third having been covered in the previous section.

Measured unemployment represents a mix of supply and demand forces, the relative contributions of which remain at the heart of many empirical debates. But what of the influence of youth wages on their unemployment as a supply choice? One might argue that increased wages lead to higher participation and if these wages were not in fact a sign of excess demand (increased opportunities) then this may yield higher recorded unemployment levels. This concurs with the argument regarding absolute own real wage on the demand side; but it might perhaps be seen as suggesting that all wage relatives should be positively signed. A second possibility is that higher wages may generate increased periods of search unemployment. However, in the

standard case, if the wage distribution is known by searchers to shift rightwards by an amount d , then the reservation wage, w^* , increases by that same amount and the expected period of search

$\frac{1}{1 - F(w^*)}$ remains unchanged.⁽³⁵⁾ Unexpected rightward shifts, on the other hand, actually decrease search by generating pleasant surprises. Similarly, high wages would presumably only be expected to retard quits if they were unexpectedly high. On the other hand, there are perhaps stronger grounds for asserting that higher real wages lead to the demand for increased leisure, resulting in more, or longer, unemployment spells.⁽³⁶⁾ This income effect, however, is in line with the simple demand based expectations presented earlier. On balance it would appear therefore that conceivable supply side arguments do not seriously contradict those derived from demand considerations; except in so far as decisions are based on relative, rather than real, wages whence one would expect some tendency for all wage relatives in the second specification to be positive.⁽³⁷⁾ However, there seems to be no reason to assume, in this context, that decisions are taken in this light, particularly as individuals cannot choose which of the age-sex groups to join.⁽³⁸⁾

One further problem with all of the foregoing is, of course, that the theoretical reasoning is in terms of wage rates. But the available data records earnings, rather than the true user cost of labour or the net returns to the worker, as discussed in detail in Chapter 3.⁽³⁹⁾ This represents an important caveat, but one which, given the current state of empirical knowledge, is not here resolved by seemingly sophisticated attempts at refining the available information. The October Earnings and Hours Inquiry remains, therefore, the measure of "the wage" in the analysis to follow.

Finally, the contrast between this section and the work of Chapter 3 has to be noted. In the latter the wage was treated as, potentially at least, a variable endogeneous to the system whilst here it is being assumed to be determined from without. In the early analyses this will have to be regarded as an assumption to be treated with suspicion, but later work does attempt to incorporate the potential endogeneity of the wage by estimating a simultaneous system.

II.iii YOUTH INTENSIVE INDUSTRIES' FORTUNES

As demonstrated in Chapter 4, youths are not distributed proportionately throughout the economy. For this reason studies of youth unemployment sometimes propose some measure of the conditions in specific youth intensive industries as being potentially important in the determination of the fortunes of young people. In cross-sectional, geographic, studies, such as Bowen and Finegan (1969), Makeham (1980) and Freeman (1982), such measures might attract a certain degree of sympathy; even though they impose aggregate factor proportions by industry to each area and the SIC's, on which such measures are based, are themselves highly aggregative. In the time-series, however, as in Lynch and Richardson (1982), such measures are much more problematic. Through time, age structures, both within and across industries, shift and the overall industrial mix changes. Together these create enormous problems for the construction of a sensible, continuous youth intensive industry mix variable.⁽⁴⁰⁾ The method of measuring youth intensive industry conditions adopted by Lynch and Richardson; namely the ratio of employment in youth intensive industries, where these are identified as of 1970, to total

employment for a 30 year data period is most unsatisfactory in this respect, and its lack of significance not surprising.

To illustrate the deficiencies of this sort of approach consider the following, simple example. Imagine an economy with but two industries I_i , where $i = 1, 2$, and two labour categories X_j , $j = 1, 2$. If X_2 represents youth labour and X_1 adult labour suppose they are distributed across the two sectors of the economy as follows

	X_{i1}	X_{i2}	$\frac{X_{i2}}{X_{i1}}$
I_1	1,000	100	0.1
I_2	3,000	90	0.03

$$\sum_{j=1}^2 \sum_{i=1}^2 X_{ij} = 4,190$$

$$\frac{\sum_{j=1}^2 X_{j1}}{\sum_{j=1}^2 \sum_{i=1}^2 X_{ij}} = \frac{1,100}{4,190} = 0.26$$

I_1 is the youth intensive sector and has 26% of total employment.

Next consider the picture some time into the future with some small employment growth, centred in I_2 , but with no change in industry input mixes, as shown below

	X_{i1}	X_{i2}	$\frac{X_{i2}}{X_{i1}}$
I_1	1,000	100	0.1
I_2	3,600	108	0.03

$$\sum_{j=1}^2 \sum_{i=1}^2 X_{ij} = 4,808$$

$$\frac{\sum_{j=1}^2 X_{j1}}{\sum_{j=1}^2 \sum_{i=1}^2 X_{ij}} = \frac{1,100}{4,808} = 0.23$$

On the Lynch and Richardson measure the importance of I_1 in the economy has declined and they would, therefore, hypothesise an increase in the unemployment of youths (X_2). However, the absolute employment of youths has in fact increased, and, if there had been no change in their registered workforce size, then their unemployment rate has decreased. Equally, if the increased employment of X_1 represents labour market entrants (married females?) then the relative unemployment of youths to adults (the Lynch and Richardson measure) has fallen.

Next consider the case where I_1 actually grows in importance to the economy, but its factor ratio changes, for instance,

	X_{i1}	X_{i2}	$\frac{X_{i1}}{X_{i2}}$
I_1	1,100	55	0.05
I_2	3,000	90	0.03

$$\sum_{j=1}^2 \sum_{i=1}^2 X_{ij} = 4,245$$

$$\frac{\sum_{j=1}^2 X_{j1}}{\sum_{j=1}^2 \sum_{i=1}^2 X_{ij}} = \frac{1,155}{4,245} = 0.27$$

Then, if the number of X_2 in the labour force has remained constant, their unemployment rate has risen. Also, if the number of X_1 unemployed has not risen (by much), and here their employment has not fallen, then the relative unemployment of X_2 will have increased. Again this result runs counter to the Lynch and Richardson hypothesis.⁽⁴¹⁾

The construction of such counter examples is clearly not difficult, even without making terribly unrealistic assumptions regarding industry youth intensity or unemployment movements. However, it might be argued that factor intensity measures of this sort are defensible if some attempt is made to control for relative wage rates and factor supplies. Indeed Lynch and Richardson do this, although they do not relate them to the youth intensity variable. But such an argument would be based on the application of general

equilibrium reasoning. The principal objection to this is that quite simply a market clearing economy is not under consideration. Nevertheless, consumer demands do help determine production decisions and, if the general equilibrium abstraction is made, then for the economy to remain in a fixed factor endowment production Box, factor intensities must change as the outputs (of the two industries) change. This is simply a restatement of the fact that the contract curve is convex. Thus, positing fixed industrial factor ratios cannot be justified, without taking account of factor prices. But, in time series, it is difficult to argue that an unchanging technology exists, and this is essential for the previous arguments to hold with any degree of certainty.⁽⁴²⁾

In the face of the foregoing objections, time-series industrial mix variables do not appear to have any unambiguous role to play in an attempted explanation of youth unemployment. The exception might be if one were to chart the employment of young people across all industries through time. But then this becomes akin to a general business conditions variable, and also makes any estimation of unemployment as a function of employment and registered labour supply tautologous. Such a measure can therefore have no role in a model of youth unemployment and so the likely influence of labour supply is the next issue to be taken up.

III.iv THE SUPPLY OF YOUNG PEOPLE

Attention is now turned to a variable which, in one form or another, has featured in all British models of the youth unemployment problem, not always successfully, and in many of the American treatments (for instance, Feldstein (1973), Freeman (1982), Wachter

and Kim (1982). Initially the discussion will centre around the abstract notion of labour supply to help clarify certain central issues then, this done, will turn to a consideration of the empirical measurement problems.

It might be tempting in a discussion of labour supply effects to appeal to the concept of the elasticity of substitution in production as a guide to what these might be. As will be shown, however, this is inappropriate in the current framework. For two variable factors, the elasticity of substitution is defined as the proportional change induced in their factor employment ratio by a unit change in their marginal rate of technical substitution along a given isoquant.⁽⁴³⁾ This definition is uncontested, but the reduced form methodology used here, and the explanatory arguments incorporated within it, mean recourse cannot be had to the foregoing concept or else the analysis is inherently contradictory. It is true that employers are being regarded as minimising the cost of a fixed output, as would be required if appeal was to be made to the elasticity of substitution. However, as discussed above, the wage of youths will, at least in the initial analysis, be regarded as exogenous.

The problem is then that if producers are regarded as cost minimisers, and thereby equating marginal products to wages, the alternative formulation of the elasticity of substitution between two factors a and b is

$$S_{ab} = \frac{d \log (a/b)}{d \log (P_b/P_a)}$$

where P 's represent factor prices. Thus the concept is relevant only if factor prices adjust to changed factor supplies.⁽⁴⁴⁾ If they do this then one is arguing that factor prices are a function of factor supplies and therefore they have not role in a true reduced form. In this case an equation system is called for. This line of enquiry will be pursued further in the following chapter.

The upshot of this is that if firms were initially in long-run equilibrium, producing their desired output with the optimal factor input ratio given prevailing factor prices, thus implying both factors were at best fully employed, then any increase in the supply of youths will increase their absolute, relative and percentage rate of unemployment. This, in fact, is the standard assumption made in output constrained markets. However, consideration of instances when it may not hold leads to an interesting digression which relates back to the earlier discussion of contract theoretic approaches to the labour market.

Thus in what circumstances might be the case that firms do not (apparently) optimise in the short-run? Broadly, following the discussion of Casson (1981 a, b), one can argue that this might be true when firms invest in "goodwill". Just as firms, in the contract literature, are seen as insurance brokers reducing the uncertainties faced by their employees, it seems natural to assume that, in certain circumstances, they will offer the same service, at a price, to their customers. Thus, in markets where consumers possess poor information, it may pay firms to maintain their original price quotations in order to maintain goodwill (i.e. to prevent their customers going off in search of new suppliers). The implication of this is that firms will offer to supply all that is demanded, in the short-run, at this fixed price.

Assume, for instance, that in Figure 11 firms are committed to producing the output \bar{Q} . There are two variable factors of production a and b whose price ratio is "sticky" at α . If initially only b_0 of b is available the firm will produce at point E_0 , assuming that at least a_0 of a is available.

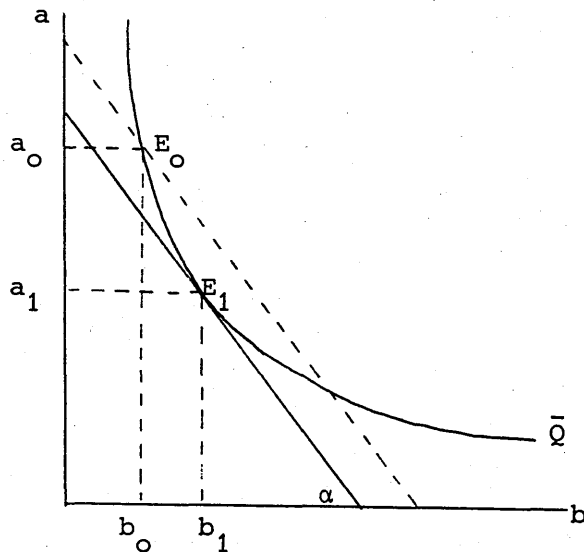


FIGURE 11

If in the next time period the supply of b increases to b_1 , the firm might optimally be seen as moving to point E_1 and employing a_1 and b_1 in the production of Q . The result of this is, therefore, that an increase in the supply of b increases the unemployment of a .⁽⁴⁵⁾ How plausible this line of reasoning is must essentially be an empirical matter. However, if the factor b above is assumed to represent young workers and the factor a older workers then there is an obvious caveat introduced by invoking analogous assumptions regarding the labour market. Thus if a workers are covered by implicit contractual provisions guarding them against redundancy, and this seems more likely in the case of adults, then once again one might not expect short-run adjustment to "optimality".⁽⁴⁶⁾ The increased supply of

young workers may then be expected, at least partially, to enter unemployment. This concurs with the earlier implication drawn from more standard analysis and will represent the working hypothesis adopted here.

Thus for given, inter alia, factor prices and output the supply of young workers will be positively related to their unemployment. Under the reasoning invoked above, this would hold true for both their absolute level of unemployment and their percentage rate of unemployment. However, one might in the latter instance, prefer to work under a form of stochastic reasoning, particularly if labour contracts are only very short-term in nature and young and old workers are good substitutes. Then one might assume that it is their labour supply in relation to the total which is of importance to their market success.⁽⁴⁷⁾ Whichever line of reasoning is adopted, however, when considering the relative unemployment of young to adult workers their relative labour supplies is the relevant concept, and the expectation is once again that this will constitute a positive influence.

Throughout the preceding discussion no mention was made of how one might measure labour supply. There are in fact many complex issues at stake, such as the distinction between "heads" and hours measures, efficiency units of labour measures and the problem of the hidden labour force. These will not be considered here, although they are raised at various other points of the work. Rather, the problem is taken to be simply that of selecting an appropriate measure of the first mentioned of these, as has been usual in this branch of the literature. If one wishes to use the number of persons in the

labour market in the various age-sex groups then one immediately runs into measurement problems with the cessation of the national insurance card count. However, even if one omits intervening observations and is content to marry data from the old series to that derivable from the new unemployment rate by age series, discussed previously, one runs once again into a potential endogeneity problem. That is, movements into and out of the labour force may not be independent of wage rates or unemployment.

For such reasons population based measures are preferred, and these will be taken from the Registrar General's annual estimates of population by age. In doing this, both absolute and relative population measures will be considered where appropriate. However, whilst one might regard population as exogeneous, although not all would agree with even this, it must be realised that the endogeneity problems spoken of above still remain in so far as differing proportions of a population of given size enter the labour market at different stages of the cycle, and this latter has not been adequately controlled for by the other variables in the model. But the problems might be regarded as less severe than those associated with labour force participation measures.

III.v UNEMPLOYMENT BENEFIT

A reasonable amount has already been said about the potential effects of the existence of unemployment benefits on unemployment, particularly on the supply side. Here then the intention will be to reiterate briefly on the points made, to provide certain extensions and then to consider the specific position of youths in this country.

The standard argument is that the existence of, exogeneously financed, unemployment benefit will increase unemployment from the

supply side. Principal among the reasons given for this is that it will prolong the individuals' duration of unemployment through increasing his, or her, reservation wage. Given a static wage distribution, this will reduce the number of acceptable potential job offers thereby reducing the probability of leaving unemployment in each period, and consequently extending the expected time before an offer is accepted.⁽⁴⁸⁾

There is, however, an argument which has received little attention in the British literature, namely that unemployment benefits may increase the flow into unemployment.⁽⁴⁹⁾ However, the contract literature concentrates in large part on this specific influence of such benefits, particularly where they are not fully experience related. By this latter is meant the degree to which firms' tax liabilities change in response to their past history of generating unemployment. It has been asserted that experience rating is "unique to UI [Unemployment insurance] systems in the United States" (Topel and Welch (1980) p.351).⁽⁵⁰⁾ However, as the primary conclusion of the literature is that the less complete the rating the greater the incentive to layoff (Feldstein (1976), Baily (1977)) then the greater the applicability the research might seem to have for a country such as Britain. The basic reasoning is that the possibility of exogeneously financed unemployment "holidays" reduces the cost to the firm of offering a contract yielding the given (competitive) worker utility.⁽⁵¹⁾ Once again it must be noted, however, that temporary lay-offs appear to be a phenomenon of limited importance in the British labour market. Furthermore, it is to be expected that young workers will be the least likely to be covered by contracts affording any substantial security because of their comparative lack of specific capital and relatively unknown (to the employer) characteristics.⁽⁵²⁾

But just as the American benefit system is somewhat complex on the employers' side (see the description in Topel and Welch (1980)) so the British system is not entirely straightforward on the employees'. The complication here comes about through the interaction of the national insurance and income taxation systems whereby the non-taxability of unemployment benefits can reduce the tax payable over the year.⁽⁵³⁾ This has led to the proposition that the marginal, rather than the average, earnings from an additional weeks work (Atkinson (1981), Atkinson and Flemming (1978)) should form the basis of analysis of investigations into benefit-induced unemployment. But note also that it has been pointed out that there is no theoretical necessity for there to be any aggregate disincentive effect of unemployment benefit. Thus, if the unemployed differ in their tastes and circumstances, increasing the reservation wage of some through increasing their benefit entitlement might, in slack demand epochs where jobs can be quickly re-offered, simply lead to the involuntary unemployed gaining work before the "voluntary" unemployed (Sawyer (1979)).

Turning to the empirical issues which arise when attempting to assess the effect of unemployment benefits on measured unemployment one can distinguish two problems. The first of these remains in an essentially theoretical vein and relates to the question of whether one should specify the benefits variable as the absolute real level of benefits obtainable if unemployed or their level relative to the earnings available if employed (the replacement ratio). Following the contribution of Maki and Spindler (1975) the tendency has been to use the latter. This appears attractive in that it relates the benefits

of being unemployed to the alternative of being in work. However, as Narendranathan et. al. (1983 p.10) point out in their study of re-employment probabilities, there is no theoretical reason why unemployment "benefits" should be specified in this ratio form rather than entering real benefits and real wages separately. Both specifications will therefore be explored in the empirical work to follow.

In the usual case, aggregate time-series analyses in Britain are faced with a series of problems regarding the appropriate definitions of both the benefits and earnings variables. Both are characterised by distributions and the use of standard summary measures for each has been heavily criticised. Virtually all papers on the British unemployment experience enter into this debate in larger or smaller degree and so extensive referencing will not here be made; save to say that Maki and Spindler (1975) usually constitutes the offending base from which most contributions take their lead.⁽⁵⁴⁾ Their procedure, and they emphasise the use of the replacement ratio, was to define the unemployment benefit variable as that available to a married unemployed male with spouse present and two children who had previously enjoyed average earnings divided by average male net earnings.⁽⁵⁵⁾ The general thrust of the criticisms levelled at this approach can be summarised as being that the typical unemployed individual is unlikely to conform to any statistical average for the economy as a whole. Of the specific points that have been raised can be noted:

1. Not all the unemployed were actually eligible for ERS. Indeed many have to rely on Supplementary Benefits, and after 12 months unemployment all have to.⁽⁵⁶⁾

2. The unemployed do not represent a microcosm of the whole labour force but are disproportionately drawn from the least skilled groups etc. Hence something less than economy average earnings is relevant to them.
3. Various disqualification criteria exist to attempt to prevent individuals taking paid leisure.
4. A point insufficiently stressed. It is virtually impossible to derive the net real returns to being in either employment or unemployment. These include not only tangibles about which statistics are available (tax and national insurance payment, family income supplement, rent and rate rebates etc.) but also about which they are not (travel to work, search costs etc., non-monetary pay) and intangibles (the psychic costs of being in either state).
5. Post unemployment earnings do not necessarily bear any strict relationship to pre unemployment earnings. Little is known about this in this country, but one might note the findings of Ellwood (1982) for the USA that the work experience lost by unemployed youths permanently effects their future wages.

Fortunately a number of these points lose a good deal of their poignancy when one is considering the youngest members of the labour force. Thus, in general, they are not eligible for insurance fund financed unemployment benefits for a variety of reasons, which include an insufficient payments record, their greater propensity to quit and their limited familial commitments. The flat-rate level of supplementary benefits payments should therefore adequately paramatise the state benefits available to them when unemployed. However, such is not the case with respect to their average earnings and when the

replacement ratio is used it will be measured as the quotient of the young persons supplementary benefit allowance to their average earnings as defined in Chapter 3.

A further problem arises when the unemployment of youths relative to adults is considered. Here some measure of relative unemployment benefits is called for and the question becomes what variable should be incorporated for adults. In recognition of the disquiet surrounding the use of unemployment benefit measures it was decided to use the ordinary supplementary benefit rate for a married man with two children aged 13-15. It cannot be said that this accurately represents the absolute level of benefits claimable by such an unemployed person - it ignores, for instance, various housing benefits but, as long as this basic element represents a constant proportion of the total, the ratio of youths to adults supplementary benefit should adequately reflect trends in the composite variable. When it comes to the equations attempting to explain the behaviour of girls unemployment relative to that of adult females it is not at all clear what measure one should use for adult unemployment income. In the first place, married women were previously able to opt for reduced national insurance contributions which made them ineligible for unemployment benefit. Secondly, supplementary benefits are means tested and, with many women as second earners, they may well not be eligible for payments under this head.⁽⁵⁷⁾ In the face of such problems it was not felt possible to include any measure of relative unemployment benefits in these equations.

III.vi FEMALE PARTICIPATION

It has sometimes been argued that the increased participation of older females in the labour force adversely affects the employment prospects of young workers, especially young females, and some suggestive evidence in favour of this was provided in the previous chapter.⁽⁵⁸⁾ A closely allied hypothesis is that it is specifically the increased activity of married females which has this effect. The usual rationalisations behind this reasoning are that such workers are exceedingly good substitutes for youths. In particular, they are concentrated at the lower end of the occupational hierarchy, and therefore enter directly into competition for the jobs which many youths often enter.⁽⁵⁹⁾ Furthermore, these occupations tend to be concentrated in relatively more buoyant service and new technology sectors. Of course, to make this competition effective, older females would need to also be favourably priced vis-a-vis young workers. The available evidence on this was presented in Chapter 3.

One possibly important aspect of this, but one on which there appears to be very little hard quantitative evidence, are the potential cost advantages obtainable from the employment of part-time workers. This might be important as the only area of increased employment through the 1970's was that of (largely female) part-time workers (see Robinson and Wallace (1984)) and much of the growth of female employment throughout the post-war period has comprised part-timers. These advantages may relate not only to any nominal wage rate differentials that may exist, but also to those stemming from the longer service requirements etc., discussed briefly in Chapter 3, for part-time workers to fall under the umbrella of the employment

protection legislation. Furthermore, there are the possibilities which exist for the evasion of national insurance payments through their judicious utilisation. However, on reflection, neither of these seem quite as strong, *ceteris paribus*, as they might at first pass.

Consider first the costs associated with the employment protection legislation. Even full-time workers have a minimum service period of two years before they fall under its rubric. In the case of the young worker group under consideration here they can have achieved, at most, this qualifying tenure.⁽⁶⁰⁾ Allied to their supposedly higher turnover propensity and the fact that coverage beyond the minimum increases with service, this might seem to considerably weaken this arm of the argument. Indeed, if the employment protection legislation is an important consideration for employers (and Daniel and Stilgoe (1978) did not find it particularly so as regards recruitment) then the relative employment instability of youths may be to their advantage, particularly as Elias and Main (1982) claim to have found evidence that part-time females do not have particularly high turnover levels.

On the second argument, regarding national insurance costs, if these are important, independent considerations to employers why do young people not undertake part-time engagements? Freeman and Medoff (1982) found considerable evidence of its importance amongst American youngsters, and there seems to be no reason why the pattern should not be replicated here.⁽⁶¹⁾ It seems reasonable to argue that the young and unmarried have a relatively high value of leisure and a somewhat loose labour market attachment. This being so, and if external sources of finance permit (and this is one possible use of increased

parental wealth), then initial part-time working may be a useful method of induction into the labour force. The objection that, at least for males, part-time work is socially unacceptable is also likely to be somewhat overstated in that multiple part-time job holding could create a full-time equivalent working week if desired. Each of the several employers would then only be liable for national insurance contributions if the earnings of the worker in that particular job exceeded the payment threshold. The theoretically possible earnings from part-time employment without anyone paying national insurance contributions are quite high.⁽⁶²⁾ Obviously the argument cannot be taken to extremes, but if employment costs are important in the fortunes of young workers then this, and related lines of reasoning, such as job-sharing, many deserve more attention than hitherto. However, that youths do not seem to have entered into competition for part-time jobs with older females, or, if they have, have failed, might suggest that all else is not equal. This will be touched on further below.

However, there are significant practical difficulties in trying to measure older females' labour market participation and strong theoretical reasons for not including any measure, however good, in a reduced form unemployment equation. The empirical problem is that of defining with any degree of exactitude just which females are economically active. In particular this relates to discouraged workers and the lack of incentives for females to register as unemployed, especially in the past when the reduced national insurance contribution option was available. The official DE series of employed and unemployed older females are therefore likely to understate true

participation, and probably to a non-constant degree.⁽⁶³⁾ Other, potentially more accurate series, are either too infrequent (the Census of Population) or too recent (the General Household Survey) to form the basis for analysis. The theoretical objection to its inclusion, however, is the potential simultaneity problem referred to earlier in the context of both general labour supply arguments and the use of unemployment as a cyclical indicator. Therefore, until a more complex albeit more realistic model of the market is developed, it seems inappropriate to include estimates of older females participation in equations purporting to be reduced forms.

III.vii SHIFT PARAMETERS AND TRENDS

Most of the work under this heading is properly the concern of the following chapter, when it considers the stability of the present model in the face of known economic or data changes, and so discussion will largely be deferred until then. However, two influences should really be considered from the outset and are now discussed in turn.

Firstly there was the passage of ROSLA in 1972 and effective from 1973. In principle the effects of this were once over, it serving simply to reduce the number of school-leavers in 1973 by eliminating those 15 year olds who would have left in that year.⁽⁶⁴⁾ This implies the need for a dummy variable taking the value one in that year and zero in all others.⁽⁶⁵⁾ But it is possible that, from 1974 onwards, the labour supply measure might have taken on a different meaning if there is an economic difference between 15 and 16 year old youths that is not fully reflected by changes in the wage rate series. However, this issue was not pursued in the current instance owing to the difficulty of specifying how this influence might have operated.

The second influence to be considered is the standard ignorance variable, the time trend. Countless arguments could be presented suggesting reasons why youth unemployment might have changed through time for reasons other than those already discussed. Unfortunately they do not all have the same implications. Thus, productivity improvements and Wilesian decaying social and moral standards might both predict upwardly trended youth unemployment. Educational improvements on the other hand might suggest employers should increase their relative demands for young workers, thereby implying downward trended youth unemployment, *ceteris paribus*. However, for the present, a simple linear trend must suffice in attempting to discern any net tendencies that existed over the data period.

IV. CONCLUSION

This chapter has had three principal aims : to chart the behaviour of post-war British youth unemployment, to select ways to measure it which are suitable for statistical modelling and to discuss the most likely influences on these measures. With reference to the first there can be no doubt that the recorded absolute unemployment of young people has risen dramatically in recent years. Of the measures selected for the modelling exercise, the first, the percentage rate of youth unemployment, behaved in a similar manner to their absolute unemployment. However, the second, which looks at the distribution of unemployment through time (by taking the ratio of youth to adult joblessness) gives a somewhat less clear-cut picture. For the purposes of the estimation to follow in the next chapter the focus will be on the impact on the various measures of youth unemployment of wages, the cycle, potential labour supply, unemployment benefit and certain shift parameters.

- (1) On the situation elsewhere see OECD (1984b, 1980).
- (2) Good general discussions about what information the unemployment statistics convey can be found in Thatcher (1976) and Lord (1981), whilst somewhat more polemical treatments are provided in Wood (1972, 1975). For evidence on the registration propensity of young people see Lynch (1983) and Richardson (1982). On that of females see, for instance, Joseph (1983) and Joshi (1978, 1981).
- (3) Estimated effects of the change were given in the DE Gazette, October 1982.
- (4) Much of the trouble lies in differentiating between gross and net job creation by the measures. For a further discussion of the various youth job schemes see Baxter and McCormick (1984). For some figures on the numbers covered by the different schemes, including those for older workers, see Bowers (1984).
- (5) In the unemployment statistics a school-leaver is defined as a young person under the age of 18 who has never had insurable employment since leaving school. Failure to satisfy either criterion renders an individual a member of the general unemployed stock.
- (6) Makeham (1980) indicates that this liberalisation was formalised in 1976.
- (7) There is also the problem that observations on many of what will be the independent variables of the analysis are only available annually.
- (8) This cannot just be because of school-leavers influences because as they enter the labour-force others are ageing out of the relevant cohort - albeit more slowly.
- (9) Makeham (1980) did estimate figures for the intervening years using data from the Family Expenditure Survey (FES). However, many of his assumptions appear somewhat dubious. For a discussion of the problems, and merits, of using data from the FES for labour market analysis see Micklewright (1984).
- (10) Note that simple interpolation for the intervening years would be inappropriate as 1973-74 represented comparative boom years.
- (11) For the years up to and including 1972 this follows immediately as there was only one employment count used.

- (12) This is similar to the approach taken by Lynch and Richardson (1982) for unemployment amongst those aged less than 20, except that their denominator was defined as total unemployment including youths.
- (13) A non-competing group argument might proceed along the lines that being a never employed school-leaver acts as a negative signal to employers which is reversed once any work experience has been gained. But this, of course, has the empirically unrealistic implication that school-leavers never obtain employment.
- (14) On simultaneous equation bias and the problems of identification see, for example, Chow (1983).
- (15) Note that if there are factors other than labour which are variable in the short-run then this employment function would not simply be the inverse of the production function, see Hazeldine (1979a).
- (16) The work of Oi (1962) is clearly in similar vein.
- (17) In the employment function literature this assumption was invoked to rationalise the observation of apparent short-run increasing returns to labour.
- (18) On segregation by sex see, for instance, Robinson and Wallace (1984) and Joseph (1983).
- (19) Lynch and Richardson (1982) used registered vacancies, by sex, as an alternative cyclical indicator. That these are under recorded is not really the problem; more it is the fact that there are well documented instabilities in the series (National Institute (1973 pp.25-26), Bowers (1976)). Note further that Lynch and Richardson use absolute vacancies as their measure which is at variance with the adult unemployment measure they use, and further serves to bedevil interpretation.
- (20) Gujarati (1972a,b) proposed the alternative rationalisation for the breakdown in the pre-existing U-V relationship, which was that of increased voluntary unemployment occasioned by the Earnings Related unemployment benefit supplement. This interpretation was supported by Feldstein (1973).
- (21) Note that legislation, such as that referred to in the "shake-out" debate, will no doubt condition pure fiscal and monetary policy effects.
- (22) The precise definition of these variables was given in the previous section.

- (23) One is then, of course, treating firms as output constrained cost minimisers. Note also that the foregoing criticism would hold if one attempted to use average hours of work as the cyclical measure.
- (24) The points made in this paragraph are further elaborated in Hazeldine (1979a).
- (25) The problem with using actual output per person employed is that it ignores the fact that in a large part of the public sector output is measured by input usage. To use only manufacturing productivity, for example, forces the assumption that public sector productivity grows at the same rate. Furthermore, the public sector has not represented a constant proportion of the economy (see Heald (1983)).
- (26) Also, youths are likely to be less extensively covered by the employment protection legislation. For a recent summary of the extent, and history, of this legislation see Farnham and Pimlott (1983).
- (27) Also on time horizons see the discussion of search theoretic models in Chapter 2 above.
- (28) As argued by Feldstein (1973), however, this is by no means universal.
- (29) See Samuelson (1983) Chapter 4 for a fuller discussion of the properties of the general model.
- (30) On these two functions and their estimation see Wallis (1979) or Layard and Walters (1978).
- (31) By considering relative youth unemployment Lynch and Richardson (1982) operate in this more general framework when they use relative employment costs. The same approach will be adopted here when considering the similarly defined dependent variable.
- (32) But note the conclusion of Treadway (1970) in his analysis of the dynamically competitive firm faced with adjustment costs that "...it appears that the intertemporal optimisation theory is not capable of yielding a number of other inferences that are implied by the standard atemporal model. Though all behaviour functions are homogeneous of degree zero in prices, we were unable to demonstrate (a) the nonpositivity of own-wage effects on the demand for the variable factor either in the short-run or the long-run,..." (Treadway (1970) p.345 italics in original).

- (33) Capital is omitted not because of a belief that short-run arguments about its fixity are appropriate in the present instance, but because of the notorious difficulties regarding both its utilisation and its price.
- (34) In principle one should also include the relative wage variables between groups excluding the one under study as well. But there are so many possible patterns of substitutability and complementarity that interpretation would be extremely hazardous. Furthermore, ten relative earnings measures would eat significantly into the available degrees of freedom.
- (35) Realistic time series search models should presumably introduce some notion of expected real wage growth.
- (36) This may be manifested in more temporary lay-offs; see, for instance, Feldstein (1973), (1976).
- (37) Demand considerations would also predict this if all factors were substitutes.
- (38) Wage relatives, have of course, received considerable attention in the wage setting/inflation literature. See Tobin (1972) and the review in Elliot and Fallick (1981).
- (39) A survey highlighting some, although not all, of the problems, particularly regarding the non-constant proportion of wage .v. non wage costs, can be found in Thomas (1981).
- (40) There is, of course, the additional problem that beyond 1972 the only detailed survey of the age distribution of employment is given in the 1981 population Census; although one might gross up from a sample survey such as the LFS for intervening years.
- (41) All this is merely a reflection of the analysis in Chapter 3 above where it was shown that it is not merely penetration of industries which determines a groups' fortunes but also the size of the industries themselves.
- (42) On the nature of technical progress see Allen (1967, Chapter 13).
- (43) See the discussion in Allen (1938, Chapter 13). This simple definition breaks down with three or more variable factors when complementarity becomes possible.
- (44) Note that factor ratios are invariant to factor price changes ($s = 0$) if production is characterised by Leontief (1951) technology (L-shaped isoquants) and only one, unique factor price ratio (overlying the isoquant) yields anything other than definite factor specialisation if they are perfect substitutes ($s = \infty$).

- (45) If the supply of b "overshoots" b_1 then, of course, its unemployment will increase (become positive).
- (46) See Chapter 2 and the references cited therein for a discussion of whether firms offer wage or employment stability or both.
- (47) "Cohort over-crowding" is in fact the major thrust of the Wachter and Kim (1982) paper.
- (48) It is probably fair to say that the currently most popular, at least in terms of citations, estimate of this effect is the, cross-sectional, elasticity of duration with respect to benefits of 0.6 found by Lancaster (1979) and supported by Nickell (1979a, b).
- (49) Nickell (1979b) points to the stability of the inflow rate of males into unemployment as justification for this.
- (50) A description of the unemployment regime in Britain, together with a consideration of what aims it might be trying to achieve, and its success in so doing, can be found in Disney (1981).
- (51) Note that such reasoning questions the relevance of the search theoretic duration effects on unemployment benefits as recall from lay-off is now employer determined.
- (52) See Casson (1981a) pp.79-80 for a discussion of which employees (and customers) one might expect to be offered the "best" contracts.
- (53) The current Conservative government has however proposed plans to make unemployment benefit taxable.
- (54) Atkinson (1981) and Micklewright (1984) and the citations therein cover the literature well.
- (55) Some assumption regarding earnings appeared necessary for the numerator because of the earnings related supplement (ERS) which existed between 1966 and 1981. Indeed the introduction of ERS sparked off the research interest.
- (56) These are means tested and financed out of general taxation as opposed to the National Insurance Fund from which unemployment benefits are drawn. See Disney (1981).
- (57) One might also note the value of housewives services as a potential offsetting benefit of their unemployment.
- (58) Makeham (1980) indeed appeared to find a significant influence on young females unemployment of the economic activity of older females.

- (59) On the clustering of, particularly part-time, females at the bottom end of the occupational hierarchy see, for instance, Robinson and Wallace (1984).
- (60) Following ROSLA that is.
- (61) There is, of course, in America much more of a tendency for youths to "work their way through college" and get recorded in the labour force statistics. The supply side objections this might lead to in a British context are considered below.
- (62) The worker does, of course, become liable for income tax once his or her cumulative earnings exceed the threshold. If effective is equivalent to formal incidence, however, this is of no relevance to the employer who is under consideration here.
- (63) Additionally, since 1972, the age breakdown of employees in work is not available.
- (64) That is, from 1974 onwards 16 year old school-leavers will comprise those who would previously have left at 15 plus those who would have left at 16 anyway. With equal and constant numbers in each discrete age year and an equal and constant percentage leaving school at each age this would imply a doubling of 16 year leavers from 1974 on.
- (65) This is not relevant when the unemployment rate of young people is considered as 1973 constitutes missing data.

CHAPTER 6

TIME-SERIES YOUTH UNEMPLOYMENT
1950-1982 : ESTIMATION

I. INTRODUCTION

Having in the previous chapter undertaken a detailed consideration of the factors likely to influence youth unemployment through time, it is now appropriate to subject the hypotheses this generated to statistical test. That is, does the data uphold the suppositions that youth unemployment is positively related to their wages, labour supply and unemployment benefit and negatively related to the cycle? As previously discussed, in addressing these questions attention will be focussed on percentage youth unemployment and on its level relative to that of adults. The analysis begins with a preliminary reduced-form examination of the performance of the models over the full period (1950-1982) for which the unemployment data was collected on a consistent basis. In recognition of the fact that the format of the earnings data was changed after 1979, and also of the growing importance of direct government labour market intervention, Section III goes on to examine the performance of the models up to 1979 and also to assess how well later observations are forecast by these new estimates. Section IV develops the stability enquiry by assessing whether there is evidence of a structural break in the relationships, with a special reference to the much researched "shake-out of labour" in the mid-1960's. Following this Section V then addresses the problems which simultaneous equation bias might introduce for the analysis and undertakes what would be more appropriate statistical analysis in these circumstances. But, in addition, this section also provides certain checks on the results of earlier sections by utilising slightly different data. Finally, Section VI provides the summary and conclusions for the analysis of

time-series youth unemployment.

II. PRELIMINARY REDUCED FORM ANALYSIS

In this section attention is paid to the reduced form model of youth unemployment estimated over the whole period 1950-1982. That is, if U is some measure of youth unemployment, then models of the general form

$$U = f(\text{GDP}, L^S, w, \text{SB}, \text{ROSLA}, t)$$

where GDP is gross output; L^S , labour supply; w , earnings; SB, supplementary benefit; ROSLA, a control for the raising of the school-leaving age and t , a simple time trend are explored. The precise measures of these variables will, of course, vary with the specific youth unemployment concept under consideration, and a certain amount of experimentation with the timing of the regressors is undertaken where appropriate.

The work is sub-divided into two principal sub-sections; the first examining the results obtained for the youth unemployment rate and the second those generated when relative youth unemployment was the subject of analysis. However, the latter is further sub-divided into the analyses including school-leavers in the numerator and those which exclude them. Clearly, exhaustive reproduction of all of the findings would result in an indigestible proliferation of material and, therefore, the presentation is selective and although biased towards the better fitting equations, "peculiar" findings have not been suppressed. As initial work revealed quite serious problems of

autocorrelation when OLS was used, all of the estimates reported have been obtained using first-order autoregressive techniques. Thus, as before, ρ represents the serial correlation parameter and, in common with all other coefficient estimates, its t-statistic is provided in parentheses.

II.1 THE YOUTH UNEMPLOYMENT RATE

As noted in the previous chapter, when looking at the percentage rate of youth unemployment there are gaps in the sample for both the January and July series. In the presence of such missing observations, maximum likelihood estimation techniques are unavailable and the two stage iterative procedure suggested by Cochrane and Orcutt (1949) was employed. Overall the results obtained were good, at least in terms of coefficients of determination, and those reported use regressors common to each equation in the table in which they are contained. Whilst this means that these are not in all cases the very best results obtained they are representative, and the gains in performance that could be demonstrated by changing the format minimal. In this instance, it was decided to report the results of the exercises using real and relative youth earnings respectively.

Across both sets of regressions certain features are common, and it is appropriate to indicate what these are before proceeding to the detailed results. Firstly, the choice of the youth population measure lay between one defined as all persons of the relevant sex aged 15 to 24 and those aged 15 to 19. The former series was available for each year in the data period whilst the latter only

commenced in 1953. However, little difference emerged between equations using either definition and so that allowing the longer estimation period is the one used here. Secondly, in both formulations the equations using the real benefits variable tended to perform somewhat better than did those containing the replacement ratio and so the former are reported. Thirdly, current GDP performed better than did simple lagged measures, particularly when used in conjunction with the percentage change in output between year (t-1) and t, and so these are the results shown. Fourth, current measures of earnings and benefits out performed any of the lagged permutations attempted, where these included simple lag measures of real earnings and benefits payable in the relevant month deflated by lagged earnings.⁽¹⁾ Finally, it is to be noted that the ROSLA dummy is not appropriate here as 1973 constitutes missing data.

(a) UNEMPLOYMENT RATE : REAL EARNINGS

Table 1 presents the results obtained when the real earnings measures were utilised, and it is clear that not all prior expectations are fulfilled. One of the strongest findings is that youth unemployment is strongly cyclical, although the variable is not significant for males in July; however, the actual coefficient values are extremely large.⁽²⁾ Secondly, youth unemployment has been strongly upward trended over the data period, but in this case not significantly so for the rate of girls' unemployment in July. One very surprising result is that the percentage year on year change in GDP appears to be positively related to the rate of youth unemployment, albeit insignificantly so in July. This result is

TABLE I
 PERCENTAGE YOUTH UNEMPLOYMENT INCLUDING SCHOOL-LEAVERS 1950-1982

	C	REAL EARNINGS	REAL BENEFITS	YOUNG POPULATION	GDP	Δ GDP	t	ρ	\bar{R}^2	D.W.
BOYS JANUARY	63.781 (4.62)	22.590 (1.65)	-3.820 (0.03)	-0.007 (1.61)	-1.252 (7.30)	0.707 (5.24)	3.109 (6.99)	0.771 (6.40)	0.810	1.891
BOYS JULY	54.876 (1199)	-90.422 (3.34)	136.318 (0.72)	-0.019 (2.17)	-0.362 (1.03)	0.461 (1.88)	4.846 (5.34)	0.828 (7.96)	0.623	1.718
GIRLS JANUARY	24.534 (2.11)	124.559 (8.27)	196.505 (0.98)	0.0003 (0.07)	-1.205 (6.49)	0.604 (2.58)	0.956 (2.77)	-0.125 (0.07)	0.916	1.559
GIRLS JULY	21.858 (0.94)	216.562 (7.62)	45.045 (0.15)	-0.001 (0.15)	-1.415 (4.23)	0.359 (0.97)	8.805 (1.19)	0.162 (0.89)	0.917	1.932

T-STATISTICS IN PARENTHESES

puzzling when it is almost universally accepted that youths are among the most flexible of factors. Furthermore, unreported equations show that other coefficients are not overly sensitive to the removal of this variable, which tends to suggest that the observed result is not the product of multicollinearity problems. Taken at face value, the implications of the findings are salutary but puzzling : youths will benefit from an upturn, but it would appear that much of this gain will be dissipated if this is too fast. This is difficult to rationalise and may just represent a statistical phenomenon with the variable proxying some other economic influence. But note that currently (mid 1985) the British economy is growing at around the historically rapid rate of 3 per cent per annum, yet as far as one is able to ascertain, and the YTS beleaguers confident interpretation, this is not serving to bring down the level of youth unemployment. One might be tempted to argue, therefore, that periods of rapid expansion are associated with periods of labour saving technological change. But, of course, this is highly speculative given the data set currently in use.

Young peoples' labour supply, as proxied by the size of the young population, is significant in only one of the four equations (boys in July) and there it enters with a negative coefficient. As pointed out above, the more restricted population definition "behaves" no better and one must therefore initially conclude that no evidence has been found to support the "cohort overcrowding" findings of Wachter and Kim (1982) for American youths. Similarly, real earnings do not fully perform in line with expectations. Thus, for young males no consistent evidence is produced in the current exercise that the level of their real earnings has been

responsible for the explosion in their unemployment. Indeed, for the month of July the coefficient on this variable is both negative and significant. Little attention has to date been paid to the behaviour of real youth earnings but, as Appendix Table A1 shows, those of young males rose continuously to a peak in 1975 but thereafter their behaviour has been erratic. It might just be, therefore, that the later observations are responsible for the results obtained in July. However, it should be noted that real girls' earnings peaked locally a year earlier and subsequently also performed erratically, yet in their unemployment regressions the variable is signed in accord with expectations and highly significant. The remaining variable in the equations represents the real level of benefits available in the relevant month of year t , and this is very poorly determined in all cases. Thus, there is no evidence at this stage to the effect that unemployment pay has had any influence on the number of young people registered as out of work.

Finally, the overall performance indicators for the equations can briefly be discussed. The first-order autoregressive parameter is highly significant in the young males equations, and although this is not the case in the girls equations the one using January data is the only one of the four, male or female, in which the DW statistic even hints at residual autocorrelation. Also, in spite of the poor performance of some of the individual regressors, three of the four models explain 80-90 per cent of the variance in the dependent variable. The fourth, with a relatively modest \bar{R}^2 of 0.6, is, interestingly, the July equation for young males. This is perhaps an early indication of why previous work has tended to concentrate on

the January data.

(b) UNEMPLOYMENT RATE : RELATIVE EARNINGS

When attention is turned to the results for the percentage rate of unemployment using relative earnings, given in Table 2, the overall performance of all equations can be seen to have improved. Now three of the equations explain over 96 per cent of the variance in the dependent variable whilst the fourth accounts for some 87 per cent. Also, only the young females' July results give serious reason to believe that whatever serial correlation existed has not been adequately captured by the first-order corrective process used.⁽³⁾

In addition to the remarks made about preferred regressors at the beginning of the section, some comment is necessary on how the measures of relative earnings were dealt with in the current formulations. Initially all four available relativities were entered - those to full-time adult males and females those to part-time adult females and those to the other youth group. At the very least this poses tremendous problems of interpretation. Even if a theoretically rigorous labour demand function were under consideration there is considerable doubt about the interpretation of cross wage terms when a non-homogeneous output is under consideration, as it most certainly is at the level of the national economy.⁽⁴⁾ In the light of this, and the fact that youth to youth and youth to full-time adult female earning variables showed considerable instability in terms of sign, size and significance, attention is here restricted to those equations in which only youth to adult male and youth to part-time adult female earnings relatives

TABLE 2
PERCENTAGE YOUTH UNEMPLOYMENT INCLUDING SCHOOL-LEAVERS 1950-1982

	C	EARNINGS RELATIVE TO ADULT MEN	EARNINGS RELATIVE TO PART- TIME WOMEN	REAL BENEFITS	YOUNG POPULATION	GDP	Δ GDP	t	ρ	\bar{R}^2	D.W.
BOYS JANUARY	35.819 (2.74)	95.811 (2.36)	-12.400 (0.56)	6.310 (0.06)	-0.007 (2.12)	-1.224 (8.91)	0.666 (5.68)	3.136 (7.38)	0.800 (7.06)	0.869	2.387
BOYS JULY	56.520 (6.92)	152.249 (12.46)	-140.193 (24.56)	203.307 (2.42)	-0.003 (1.56)	-0.451 (5.32)	0.002 (0.02)	1.853 (11.73)	0.048 (0.26)	0.995	2.142
GIRLS JANUARY	44.807 (3.35)	156.666 (12.90)	-117.172 (6.26)	220.372 (1.80)	0.001 (0.44)	-0.825 (7.52)	0.310 (2.31)	1.693 (7.94)	0.110 (0.58)	0.964	2.201
GIRLS JULY	11.179 (0.75)	303.579 (22.23)	-150.382 (7.30)	119.411 (0.99)	-0.0001 (0.05)	-0.744 (6.04)	-0.040 (0.28)	1.818 (7.48)	0.136 (0.74)	0.988	2.77

T-STATISTICS IN PARENTHESES

were included. The definition of all remaining variables in the model is then precisely the same as in the previous equations. This specification, it might be argued, appears odd in that it combines relative earnings with real benefits rather than the replacement ratio. There is, however, no real cause for concern. The earnings variables reflect demand considerations whilst the benefit measure is hypothesised to be of relevance to the supplier of labour.⁽⁵⁾ There is no theoretical reason then why the variables should be of the same form.

The earnings variables now seem to convey a much clearer picture; all relative to men are positive whilst all relative to part-time women are negative, and only one of the latter fails to achieve statistical significance. The first set of coefficients suggest substitutability whilst the second convey the impression of complementarity. It should be noted that these results are precisely the opposite of those which Hutchinson et al. (1985) achieve in their analysis of youth employment over the period 1952-1972. The conflict may arise from a host of factors such as differing sample periods (theirs is shorter), differing model specifications (theirs is larger), but the differences are great enough to suggest that much remains to be done.⁽⁶⁾

In this case the real benefits variable is stronger, but still not wholly convincing with it achieving significance in only the boys unemployment equation for July. The population measures continues to remain a puzzle, being wrong signed in three out of the four equations, although significant in only the January boys specification. Compared to the equations including real youth

earnings the GDP variable has hardened slightly whilst that for the percentage change in GDP has lost significance slightly. However, the latters' influence remains positive and significant when the January observations are used for either sex. Whether this is due to capital substitution and productivity growth, as previously suggested, or to large output changes being disregarded by employees as temporary (although this would not support the positive significance of Δ GDP) or some other reason is not clear; but it is hard to take the positive relation between the youth unemployment rate and the percentage change in GDP simply at face value. Finally, the time-trend is once again positive and highly significant. But to explain phenomena by ignorance is not particularly satisfactory.

(c) UNEMPLOYMENT RATE : CONCLUSIONS

Certain substantive conclusions do seem to emerge from this initial examination of percentage youth unemployment. Firstly, it is strongly counter-cyclical, although curiously it appears to be positively related to the speed at which output changes. Secondly, the bulk of the evidence suggests that youth earnings do matter in the determination of their unemployment. However, a theoretical interpretation of the negative coefficient on their earnings relative to those of part-time females, namely that the two groups are complements, is hard to accept when the work of Chapter 3 showed that their employment has moved in distinctly opposite directions. Thirdly, neither labour supply nor unemployment benefits appear to have influenced the behaviour of youth unemployment in post-war Britain. Finally, both the rate of young

male and young female unemployment have been strongly upward trended for reasons not incorporated in the model.

II.ii RELATIVE UNEMPLOYMENT

As stated in the previous chapter, certain objections could be raised against the measure of youth unemployment used in the above exercise. In an attempt to meet these, and also to provide further comparisons with earlier work, attention is now turned to youth unemployment relative to that of adults, where the six measures to be used are as given previously. Before considering the results of this exercise in detail, however, certain general points need to be made. The first of these concerns sample size and estimation method. For the July data a continuous series of observations is available meaning that the Beach and MacKinnon (1978) maximum likelihood autoregressive procedure could be used. For the January data, on the other hand, industrial action at the Department of Employment in 1975 means that a gap exists in the series and the Cochrane-Orcutt (1949) procedure had to be utilised.

Secondly, the consolidated presentation used in the rate equations was not followed as the results for alternative specifications differed widely and, in general, were very poor indeed. Therefore, the best results are reported with precise variable definitions given in the notes to the table where these are not current year for GDP and relative earnings or not youth aged 15 to 24 relative to those aged 25-65 for the population variable.⁽⁷⁾ When this latter definition is changed, of course, the sample of observations begins in 1953 rather than 1950. It should also be

noted here that the same upper age limit of 65 was used for both males and females even though the official retirement age for females is 60. Early experimentation revealed that the choice of cut-off made little difference to the results, which may be a reflection of the fact that the 1981 Census of Population indicates that 22.4 per cent of females aged 60-64 were still economically active.⁽⁸⁾

(a) INCLUDING SCHOOL-LEAVERS

Turning to the more detailed results, Table 3 provides the relative unemployment equations where the youth measures include unemployed school-leavers.⁽⁹⁾ A casual glance at the \bar{R}^2 's reveals how poorly the equations perform overall, but it also points to two other interesting features of the results. The first is that the performance of the January equations consistently outstrips those for July. Secondly, in spite of the usual presumption that it is difficult to explain the labour market behaviour of females, the results for girls are better than those for boys - whether these are relative to adult men or women. Lastly, the serial correlation coefficient is significant in 7 out of the 8 cases, indicating the first-order scheme is capturing at least some of the autocorrelation which existed. However, the July results in particular indicate that the problems have not been entirely removed.

Looking at the earnings variables for young males one can only conclude that there is no statistical evidence that they have had any impact on their unemployment relative to adult males. In the case of girls' unemployment relative to that of adult males there is some evidence of the two being substitutes, at least taking the January

TABLE 3
RELATIVE UNEMPLOYMENT INCLUDING SCHOOL-LEAVERS

	C	RELATIVE EARNINGS	RELATIVE POPULATION	RELATIVE BENEFITS	ROSLA	GDP	Δ GDP	t	p	\bar{R}^2	D.W.
BOYS TO MEN JANUARY	-0.123 (0.64)	0.010 (0.70)	0.580 ^(a) (1.17)	1.109 (1.37)	0.008 (0.99)	-0.003 (2.71)	0.002 (2.11)	0.004 (2.16)	0.704 (5.14)	0.263	1.921
BOYS TO MEN JULY	-0.005 (0.01)	-0.325 (0.87)	1.559 ^(a) (0.98)	-0.636 (0.28)	-0.036 (1.47)	0.003 (1.06)	0.001 (0.54)	-0.003 (0.51)	0.626 (8.01)	-0.054	1.325
GIRLS TO MEN JANUARY	-0.574 (3.78)	0.484 ^(b) (4.10)	0.186 (0.46)	2.141 (3.56)	0.017 (2.14)	-0.002 ^(c) (2.38)		0.001 (0.63)	0.497 (3.14)	0.541	1.638
GIRLS TO MEN JULY	-0.242 (0.48)	0.163 (0.51)	-0.474 (0.39)	1.256 (0.61)	-0.012 (0.63)	-0.000 ^(c) (0.04)		0.003 (0.62)	0.764 (6.68)	-0.081	1.3001

Continued

TABLE 3 (Continued)

	C	RELATIVE EARNINGS	RELATIVE POPULATION	RELATIVE BENEFITS	ROSLA	GDP	Δ GDP	t	p	R ²	D.W.
GIRLS TO WOMEN JANUARY	0.554 (2.32)	-1.161 (3.19)	1.618 ^(a) (1.63)		0.063 (2.25)	0.003 (1.37)		-0.004 (0.87)	0.213 (1.13)	0.341	2.032
GIRLS TO WOMEN JULY	0.611 (1.19)	-2.147 (2.61)	3.929 ^(a) (1.09)		0.053 (0.94)	0.008 (1.35)		-0.008 (0.61)	0.696 (4.95)	0.284	1.374

T-STATISTICS IN PARENTHESES

NOTES: (a) Relative population = youths 15-19/adults 20-65

(b) Earnings lagged one year

(c) GDP lagged one year

observations, and this is consistent with the findings from the unemployment rate regressions. Finally, on looking at girls' unemployment relative to that of older females the significant negative coefficients suggest that the two groups may be complements.

Once again labour supply, as measured by relative population, does not appear to have had any clear cut impact on youth unemployment, although in this instance it is at least of the correct sign in 5 out of the 6 formulations. However, the ROSLA dummy variable performs perversely in 4 of the equations, and is significant in the two of these modelling young females' unemployment in January. But it is correctly signed in two of the three July equations, albeit insignificant, and many would presume that this would be when the measure would have had its greatest impact.

As argued previously, there is some doubt about how one should incorporate unemployment income into equations modelling the unemployment of girls relative to adult women and, in consequence, the relative benefits variable has been omitted from these. Furthermore, the evidence from the remaining four equations is mixed. For girls' unemployment relative to men the coefficients have the expected positive sign, although they are significant only for the January data. However, in the young males equations the variable changes sign across the months of data observation, but is significant in neither case. Once again therefore, the aggregate data in use here reveals little evidence in favour of the usual induced unemployment hypothesis.

To accord with standard human capital theory, and the reasoning put forward regarding quit behaviour, the coefficient on the GDP

variable should be negative. This is in fact true in half of the equations and two of these are the only ones in which the measure is significant. But the positive coefficient on GDP in the girls to women equations is interesting. Thus the standard arguments alluded to above refer to comparisons of young people with some imaginary individual with more or less total labour market commitment. Usually the empirical counterpart to this abstraction is assumed to be the (married) prime age male. There would appear to be insufficient evidence at the moment to indicate where older females fit into such arguments. Furthermore, it should be appreciated that unemployed females are quite likely to include among their number some who would be part-time workers and perhaps, therefore, the positive coefficients in these equations should not be viewed as "perverse".

Of the equations reported here, the percentage change in GDP appears only in the two involving young males. In both cases the variable is positively signed, although it is only significant when January data is used. This rather surprising result is analogous to that found when youth unemployment was modelled as a rate percentage and might be regarded as additional evidence that rapid growth and the simultaneous reduction of youth unemployment appear to be incompatible policy goals.

Finally, one can note that the time trend is significant in only the boys' January equation so that it would appear that there remains room for rather more powerful cyclical, as opposed to secular, regressor(s) in the explanation of relative youth unemployment. But, on the other hand, certain possible difficulties remain with the

exercise of which one might be the inclusion of school-leavers in the numerator of the dependent variable. To see if this is adversely influencing the results attention is turned to estimating the models excluding school-leavers from the young unemployed.

(b) EXCLUDING SCHOOL LEAVERS

Table 4 presents the best of the results obtained when the data was restricted to exclude unemployed school-leavers and where, once again, variable definitions are given in the notes to the table when these do not conform to the "standard" model. Immediately, however, it can be seen that the overall explanatory power of none of the equations is improved significantly, and in some cases falls. But the general impression conveyed by the DW statistics is one of slight improvement in the autocorrelative properties. As there is not a great deal of difference between these results excluding school-leavers and the earlier ones in which they were included, at least in terms of the directional impact of the regressors (although their precise magnitude is sensitive to specification) only brief comment will be made on the more significant changes.

In the first place, the change in GDP no longer figures in any of the equations. Secondly, the population measure is now correctly signed in all cases and has improved markedly in the boys' July equation and in the girls' unemployment relative to adult male equation for the same month. Thirdly, ROSLA is now positive in five equations, significant in three of these and almost so in a fourth. This, of course, runs directly counter to prior reasoning but is probably most indicative of the problems which surround the use of

TABLE 4
RELATIVE UNEMPLOYMENT EXCLUDING SCHOOL-LEAVERS

	C	RELATIVE EARNINGS	RELATIVE POPULATION	RELATIVE BENEFITS	ROSLA	GDP	t	p	\bar{R}^2	D.W.
BOYS TO MEN JANUARY	-0.037 (0.43)	-0.070 (0.97)	0.275 (1.19)	0.396 (1.24)	0.008 (2.02)	-0.004 (0.75)	-0.0006 (0.51)	0.825 (8.00)	0.150	1.819
BOYS TO MEN JULY	0.044 (0.41)	0.035 (0.48)	0.504 ^(a) (2.08)	-0.474 (1.05)	-0.004 (0.72)	0.0008 ^(c) (1.42)	-0.002 (1.83)	0.334 (1.63)	0.008	1.668
GIRLS TO MEN JANUARY	-0.326 (3.14)	0.150 ^(b) (1.83)	0.120 (0.44)	1.225 (3.16)	0.010 (1.95)	0.0001 ^(c) (0.27)	-0.001 (1.34)	0.562 (3.72)	0.365	1.811
GIRLS TO MEN JULY	0.037 (0.33)	0.122 (1.59)	0.628 ^(a) (1.73)	-0.183 (0.39)	0.0005 (0.12)	0.0003 ^(c) (0.52)	-0.0008 (0.74)	0.820 (7.81)	0.082	1.303

Continued

TABLE 4 (Continued)

	C	RELATIVE EARNINGS	RELATIVE POPULATION	RELATIVE BENEFITS	ROSLA	GDP	t	ρ	\bar{R}^2	D.W.
GIRLS TO WOMEN JANUARY	0.575 (2.48)	-0.505 (2.20)	0.376 ^(a) (0.29)		0.039 (2.47)	-0.0003 (0.17)	-0.006 (1.10)	0.910 (11.41)	0.185	1.972
GIRLS TO WOMEN JULY	0.411 (3.01)	-0.921 (4.58)	0.549 ^(a) (0.52)		0.029 (2.06)	0.004 ^(c) (2.21)	-0.005 (1.64)	0.911 (13.53)	0.397	1.336

T-STATISTICS IN PARENTHESES

NOTES: (a) Relative population = youths 15-19/adults 20-65

(b) Earnings lagged one year

(c) GDP lagged one year

dummy variables to capture single events in a world in which many structural changes occur simultaneously. Thus one need only note that ROSLA coincided with the period of oil crisis to realise that unambiguously controlling for the former in aggregate analyses is a very difficult task to achieve satisfactorily. Finally, the trend is now negative in all equations, although it always fails to achieve significance at the 5 per cent level. It would appear, therefore, that the poor results obtained earlier when attempting to model youth unemployment relative to that of adults were not altogether due to the inclusion of school-leavers.⁽¹⁰⁾

(c) RELATIVE UNEMPLOYMENT : CONCLUSIONS

At this point, the conclusions one might venture regarding the determination of relative youth unemployment through time are very limited. There is reasonable support for the hypothesis that young people are more sensitive to the cycle than older men, although the situation is not so clear cut when girls are compared to adult females. The strongest support for relative earnings influences comes from the young females' equations, where they appear to be substitutes for adult males and complements with older females. When school-leavers are excluded, labour supply is at least consistently correctly signed whilst the percentage change in output no longer figures in the preferred equations. This latter finding makes one wonder if rapid growth occurs at times of, seemingly indiscriminate, labour saving technological change. There is no support found for the benefit-induced unemployment hypothesis and, lastly, too many changes seem to have been occurring in the mid-1970's for the simple

ROSLA dummy to identify any impact that this particular piece of legislation may have had.

Overall the results are not good and certainly compare unfavourably with those obtained for the percentage rate of youth unemployment. This is perhaps disturbing when not only is the data set on relative unemployment more nearly complete, it is also open to fewer objections regarding its derivation. Furthermore, the size of many of the coefficients, and in some cases even their direction of impact, is sensitive to which months data is used. But whilst these initial findings are not satisfactory, and serve to cast at least some doubt on the strength of earlier findings, there remain certain avenues to explore before firm conclusions are made. Before going on to these methodological and statistical extensions, however, one general aspect of the current approach should be stressed. This is that the models so far estimated, and the extensions to follow, are all linear. The decision to explore such formulations alone was taken prior to estimation. Simple logarithmic transformation represents the most obvious, and most popular, alternative; although there are a variety of other possibilities. But, taking the first mentioned as an example, there do not appear to be any particularly strong grounds for arguing that there is some multiplicative (Cobb-Douglas) reduced form unemployment generating technology. Rather than "mine" transformations, with or without some attempted justification of the particular one generating the best fit, it appeared most useful, and interesting, to embark upon a comprehensive examination of the most obvious, albeit the most simple.

III. FORECASTING

The first issue to be taken up in extending the work of the previous section is an examination of the ability of the models to predict the final few unemployment observations. One possible way to do this is to follow Lynch and Richardson (1982) and enquire how well regressions estimated for the whole of the period track the last few observations on the dependent variable. It is preferable, however, to re-estimate the models afresh for the truncated data period and examine how the new estimates perform in predicting the omitted dependent variable observations. Furthermore, if, as here, autoregressive correction techniques are employed in the core period it is possible to make the forecasts truly dynamic by incorporating the estimated value of ρ into the prediction generating mechanism. This procedure was the one adopted. The question remains, however, of which terminal observations to reserve for prediction?

In the present instance data considerations present strong candidates. Thus, as previously noted, the definition of the earnings variables was changed after the 1979 Inquiry. This suggests that the models might fruitfully be re-estimated over the period 1950-1979 with the three years 1980-1982 omitted for the prediction exercise. The case for such a split is further strengthened by the increased intensity of government sponsored direct job creation measures in the later period. When this became significant, in the sense that they radically altered the behaviour of the unemployment series, is impossible to say and as far as youths are concerned may not have been until YTS got off the ground in 1983. Nevertheless, various schemes, with different target groups, have been in existence

for some time and must add weight to the case for examining whether later years constitute unpredictable outliers.⁽¹¹⁾ In the light of this, the prediction exercise can be looked upon as one which tests for a structural break and/or one in errors in variables.

Tables 5-8 present the results of estimating the model with a terminal observation date of July 1979. As the sign pattern of coefficients is generally the same as those found for the longer estimation period overly detailed comment is not necessary, although certain important issues do emerge. Thus whilst the direction of influence of most of the regressors is unchanged, the estimated size of them is highly sensitive to the inclusion or otherwise of the last three years data. Such instability is disturbing in terms of policy orientated conclusions. A second general point to note, however, is that autocorrelation is still apparent in several of the equations and techniques designed to deal with more complex serial correlation processes than the first-order one used here might usefully be applied.

The percentage unemployment rate equations are provided in Tables 5 and 6 and once again those using relative earnings measures are somewhat better than those using real earnings. Indeed if anything these latter equations perform worse over the truncated data period that they did previously. The general conclusions to be drawn from the preferred formulation are that the influence of relative earnings is extremely strong; that youth unemployment has been trended upwards for ostensibly extraneous reasons; that the level of economic activity does significantly affect young workers' prospects and that the bulk of the evidence does suggest that there exists a

TABLE 5
 PERCENTAGE YOUTH UNEMPLOYMENT INCLUDING SCHOOL-LEAVERS 1950-1979

	C	REAL EARNINGS	REAL BENEFITS	YOUNG POPULATION	GDP	Δ GDP	t	p	\bar{R}^2	D.W.
BOYS JANUARY	42.876 (3.11)	-8.028 (0.68)	69.243 (0.79)	-0.007 (2.17)	-0.699 (2.73)	0.408 (3.02)	2.423 (3.89)	0.792 (6.48)	0.492	2.623
BOYS JULY	24.947 (2.47)	-47.580 (5.36)	149.491 (2.82)	-0.010 (3.78)	-0.244 (1.22)	0.169 (1.75)	2.745 (5.34)	0.850 (8.06)	0.754	1.391
GIRLS JANUARY	18.081 (1.85)	130.166 (7.89)	177.07 (1.04)	0.0001 (0.04)	-1.049 (3.26)	0.297 (1.42)	0.594 (1.41)	-0.013 (0.52)	0.893	1.832
GIRLS JULY	27.807 (1.56)	264.272 (8.84)	308.524 (0.98)	-0.001 (0.10)	-1.919 (3.42)	0.470 (1.21)	0.936 (1.20)	-0.166 (0.84)	0.917	1.327

T-STATISTICS IN PARENTHESES

TABLE 6
 PERCENTAGE YOUTH UNEMPLOYMENT INCLUDING SCHOOL-LEAVERS 1950-1979

	C	EARNINGS RELATIVE TO ADULT MEN	EARNINGS RELATIVE TO PART- TIME WOMEN	REAL BENEFITS	YOUNG POPULATION	GDP	Δ GDP	t	p	\bar{R}^2	D.W.
BOYS JANUARY	44.449 (4.00)	41.652 (3.07)	-60.347 (6.99)	193.609 (2.59)	-0.003 (1.84)	-0.370 (3.28)	0.158 (1.69)	1.247 (5.52)	-0.028 (0.14)	0.968	2.140
BOYS JULY	16.633 (1.66)	190.822 (15.58)	-110.283 (14.39)	157.927 (2.4)	-0.004 (3.09)	-0.296 (3.21)	0.112 (1.37)	1.175 (5.95)	-0.086 (0.43)	0.996	1.758
GIRLS JANUARY	31.254 (3.54)	140.094 (18.42)	-104.870 (8.21)	111.208 (1.46)	-0.001 (0.90)	-0.349 (3.11)	0.211 (2.27)	0.914 (4.74)	-0.020 (0.10)	0.978	2.630
GIRLS JULY	8.377 (0.92)	294.861 (40.55)	-143.047 (10.84)	237.075 (3.12)	-0.004 (2.52)	-0.544 (5.18)	0.139 (1.50)	1.405 (7.32)	-0.156 (0.79)	0.995	1.857

T-STATISTICS IN PARENTHESES

TABLE 7

RELATIVE UNEMPLOYMENT INCLUDING SCHOOL-LEAVERS

	C	RELATIVE EARNINGS	RELATIVE POPULATION	RELATIVE BENEFITS	ROSLA	GDP	Δ GDP	t	ρ	\bar{R}^2	D.W.
BOYS TO MEN JANUARY	-0.136 (0.96)	0.361 (0.63)	0.089 (a) (0.29)	1.728 (2.51)	0.015 (1.59)	-0.008 (5.03)	0.004 (4.47)	0.016 (4.08)	0.305 (1.57)	0.661	1.824
BOYS TO MEN JULY	-0.146 (0.39)	0.723 (1.91)	1.629 (a) (1.46)	-0.113 (0.07)	-0.026 (1.37)	0.007 (2.03)	0.006 (3.04)	0.012 (1.59)	0.866 (8.91)	0.375	1.306
GIRLS TO MEN JANUARY	-0.537 (5.54)	0.580 (b) (7.06)	-0.062 (0.24)	2.597 (5.28)	0.014 (2.04)	-0.005 (c) (6.18)		0.008 (4.92)	0.243 (1.35)	0.824	2.199
GIRLS TO MEN JULY	-0.173 (0.45)	0.374 (1.54)	0.703 (0.74)	0.924 (0.62)	-0.027 (1.96)	-0.007 (c) (3.04)		0.016 (3.45)	0.878 (10.32)	0.223	1.865

Continued

TABLE 7 (Continued)

	C	RELATIVE EARNINGS	RELATIVE POPULATION	RELATIVE BENEFITS	ROSLA	GDP	Δ GDP	t	ρ	\bar{R}^2	D.W.
GIRLS TO WOMEN JANUARY	0.746 (2.77)	-1.132 (2.75)	1.390 ^(a) (1.38)		0.079 (2.62)	-0.002 (0.33)		0.006 (0.59)	0.209 (1.05)	0.425	1.944
GIRLS TO WOMEN JULY	0.892 (2.02)	-0.674 (0.90)	2.105 ^(a) (0.66)		-0.054 (1.04)	-0.016 ^(c) (2.07)		0.044 (2.66)	0.803 (7.00)	0.451	1.427

T-STATISTICS IN PARENTHESES

NOTES: (a) Relative population = youths 15-19/adults 20-65

(b) Earnings lagged one year

(c) GDP lagged one year

TABLE 8
RELATIVE UNEMPLOYMENT EXCLUDING SCHOOL-LEAVERS 1950-1979

	C	RELATIVE EARNINGS	RELATIVE POPULATION	RELATIVE BENEFITS	ROSLA	GDP	t	p	\bar{R}^2	D.W.
BOYS TO MEN JANUARY	0.050 (0.55)	-0.165 (1.59)	0.160 (0.74)	0.3375 (1.33)	0.012 (2.79)	-0.001 (1.77)	0.003 (1.82)	0.708 (5.21)	0.268	2.023
BOYS TO MEN JULY	0.073 (0.96)	-0.008 (0.12)	0.239 ^(a) (1.33)	-0.034 (0.10)	-0.08 (2.09)	-0.001 ^(c) (2.39)	0.003 (2.26)	0.328 (1.58)	0.368	1.730
GIRLS TO MEN JANUARY	-0.291 (4.78)	0.213 ^(b) (4.14)	-0.035 (0.21)	1.500 (4.74)	0.007 (1.56)	-0.002 ^(c) (4.35)	0.004 (3.57)	0.212 (1.17)	0.717	2.384
GIRLS TO MEN JULY	0.075 (0.89)	-0.055 (0.90)	0.564 ^(a) (1.97)	-0.120 (0.34)	-0.004 (1.26)	-0.001 ^(c) (2.5)	0.003 (2.38)	0.858 (9.12)	0.386	1.423

Continued

TABLE 8 (Continued)

	C	RELATIVE EARNINGS	RELATIVE POPULATION	RELATIVE BENEFITS	ROSLA	GDP	t	p	\bar{R}^2	D.W.
GIRLS TO WOMEN JANUARY	0.530 (2.56)	-0.632 (2.39)	0.062 ^(a) (0.05)		0.048 (2.50)	-0.001 (0.29)	0.004 (0.41)	0.778 (6.07)	0.196	1.950
GIRLS TO WOMEN JULY	0.487 (3.45)	-0.805 (3.46)	0.154 (0.15)		0.018 (1.14)	0.001 (0.39)	0.001 (0.19)	0.895 (11.14)	0.403	1.156

T-STATISTICS IN PARENTHESES

NOTES: (a) Relative population = youths 15-19/adults 20-65

(b) Earnings lagged one year

(c) GDP lagged one year

certain amount of benefit-induced unemployment amongst this group. However, the influence of population movements and of the speed of output change appear somewhat contrary to prior expectation, although the variables are not always significant.

The results for relative youth unemployment, given in Tables 7 and 8 are once again mixed, although the overall level of performance is somewhat better for the shorter estimation period. But it should be noted that there are certain indications of even sign instability when the results are compared to the earlier ones. The most significant development to emerge in these analyses is that now GDP is correctly (negatively) signed in all but one of the equations and its significance levels lead to some confidence to the predication that an upturn in economic activity will be to the relative benefit of young workers, at least compared to adult males. Finally, the equations including school-leavers work somewhat better than those which exclude them, which suggests their omission may amount to misspecification.⁽¹²⁾

But as well as comparing the above results with those obtained for the longer data period this section, as discussed above, is concerned with how accurately the unemployment observations for 1980-1982 are predicted by the models estimated over the period 1950-1979. A failure to predict accurately suggests, of course, that care should be taken in extrapolating the results obtained forward in time. Table 9 presents the forecast and actual values of the percentage rate of youth unemployment. Whichever of the formulations is used, it can be seen that male youth unemployment is progressively under-predicted with the under-estimate lying between 4 and 7 percentage

TABLE 9

PERCENTAGE UNEMPLOYMENT : DYNAMIC FORECASTS

USING REAL EARNINGS

		1980	1981	1982
BOYS JANUARY	FORECAST	12.70118	18.79879	18.95653
	ACTUAL	10.30000	19.09999	23.09999
BOYS JULY	FORECAST	25.72486	25.52205	26.57470
	ACTUAL	31.09999	30.59999	33.50000
GIRLS JANUARY	FORECAST	17.14297	20.94984	18.70602
	ACTUAL	11.90000	19.20000	22.00000
GIRLS JULY	FORECAST	33.62762	40.11253	36.69496
	ACTUAL	32.09999	31.09999	33.29999

USING RELATIVE EARNINGS

BOYS JANUARY	FORECAST	14.94500	15.60685	17.46447
	ACTUAL	10.30000	19.09999	23.09999
BOYS JULY	FORECAST	24.37332	24.87614	27.24112
	ACTUAL	31.09999	30.59999	33.50000
GIRLS JANUARY	FORECAST	12.84187	13.71676	16.19668
	ACTUAL	11.90000	19.20000	22.00000
GIRLS JULY	FORECAST	26.30665	27.04611	28.69826
	ACTUAL	32.09999	31.09999	33.29999

points by 1982. The picture is less clear cut for young females but if one concentrates on the model utilising relative, as opposed to absolute, earnings, which does appear to be the best fitting, then a similar result emerges. One cannot, of course, use the estimated relationships to explain why these prediction errors occur, but certain issues should be raised.

The first of these is that the job creation programmes have become progressively more adventurous as the decade has unfolded and one might therefore express surprise at increasingly larger under-prediction.⁽¹³⁾ Secondly, one might have assumed that as the recession ground on with no sign of abating the knowledge of its effects on job prospects should have become more widespread and retarded school-leaving. But thirdly, it may be that the breakdown reflects the change in the earnings definitions from 1980 onwards, and one might draw some support for this from the fact that the earnings variables are stronger over the truncated data period. However, it is not clear why the effect of this should have got progressively larger.

The forecast and actual values for relative youth unemployment including school-leavers are presented in Table 10. In this case the tendency is definitely towards over-prediction, particularly for 1981 and 1982. This is true for all the relatives considered for both data months. Whilst the previous evidence suggested there had been an unexplained upward shift in youth unemployment the current information leads to the inference that, in spite of this, young

TABLE 10

DYNAMIC FORECASTS INCLUDING SCHOOL-LEAVERS

		1980	1981	1982
BOYS TO MEN JANUARY	FORECAST	0.05941	0.10376	0.11182
	ACTUAL	0.05823	0.06719	0.06139
BOYS TO MEN JULY	FORECAST	0.14135	0.22465	0.13989
	ACTUAL	0.18605	0.10932	0.10003
GIRLS TO MEN JANUARY	FORECAST	0.05681	0.07709	0.09403
	ACTUAL	0.05692	0.05643	0.04884
GIRLS TO MEN JULY	FORECAST	0.14559	0.19345	0.12945
	ACTUAL	0.16065	0.09230	0.08215
GIRLS TO WOMEN JANUARY	FORECAST	0.17019	0.17255	0.20075
	ACTUAL	0.13672	0.14856	0.13279
GIRLS TO WOMEN JULY	FORECAST	0.35418	0.45109	0.38161
	ACTUAL	0.37321	0.24869	0.21697

people have fared better than one would have expected relative to adults. Tentatively, one might suggest therefore that government intervention in the labour market has been to the relative advantage of young people.

This impression is confirmed when one looks also at the forecasting performance of the equations excluding school-leavers, details of which are provided in Table 11. Whilst the absolute forecast errors in this instance are comparatively small, this is simply a reflection of the importance of unemployed school-leavers in the youth total for these later years. In percentage terms the errors are of the same order of magnitude as those recorded when they are included. The upshot of this would appear to be that whilst the majority of the direct government aid has been targeted at school-leavers, youths with some work experience also reaped some of the benefits, judging by their relative unemployment performance.

But to reiterate the main findings of this section; estimation of the unemployment relationships up to 1979 generates under-predictions of the rate of youth unemployment for the years 1980-1982 whilst the level of youth unemployment relative to that of adults is consistently over-predicted for this three year period. The casual inference must, therefore, be that whilst the various government job support schemes have been insufficient to bring the rate of youth unemployment down to the levels one would expect if it had maintained its previous relationships with other economic magnitudes they operated to reduce the level of youth unemployment relative to that of adults below what one would expect. This latter is probably in line with the emphasis afforded to the plight of the two groups,

TABLE II

DYNAMIC FORECASTS EXCLUDING SCHOOL-LEAVERS

		1980	1981	1982
BOYS TO MEN JANUARY	FORECAST	0.04810	0.04178	0.04098
	ACTUAL	0.03566	0.03473	0.02215
BOYS TO MEN JULY	FORECAST	0.03943	0.04666	0.04683
	ACTUAL	0.03864	0.02540	0.01903
GIRLS TO MEN JANUARY	FORECAST	0.03325	0.04240	0.04898
	ACTUAL	0.03304	0.02682	0.01695
GIRLS TO MEN JULY	FORECAST	0.02969	0.03787	0.02792
	ACTUAL	0.03138	0.01834	0.01417
GIRLS TO WOMEN JANUARY	FORECAST	0.08944	0.08833	0.09425
	ACTUAL	0.07936	0.07061	0.04610
GIRLS TO WOMEN JULY	FORECAST	0.06863	0.06906	0.06832
	ACTUAL	0.07291	0.04943	0.03742

although whether this is desirable on strictly economic grounds is a question that remains unanswered. However, the relative unemployment equations in particular still leave some room for disquiet and the next section further extends the analysis by considering whether the assumption of single unchanging unemployment relationships is a sufficiently realistic one, even if the data period is terminated in 1979.

IV. STRUCTURAL CHANGE

It has been shown in the previous section that the estimated models do not forecast well the unemployment observations from 1980 onwards. But this still implicitly assumes that the model does hold for all sub-periods from 1950-1979. This may be seriously misleading. To test for the possibility that this is in fact not true recourse is made in this section to a statistical test of structural stability attributable to Chow (1960). Essentially this is simply a particular application of the F-statistic which tests for the validity of sets of restrictions on regression coefficients.⁽¹⁴⁾ In this particular application, the restriction under test is whether the regression coefficients can validly be regarded as equal in two sub-periods within the total estimation time-span.

The statistic used to test whether this null hypothesis (i.e. equality) is valid is defined as:

$$F = \frac{(S - (s_1 + s_2))/K}{(s_1 + s_2)/(n_1 + n_2 - 2K)}$$

where S is the sum of squared residuals from a regression run over the whole data period (the restricted case), s_1 and s_2 are the residual sums of squares from the regressions run on the sub-periods separately, K is the number of regressors (and therefore the number of restrictions imposed), n_1 and n_2 the number of observations in the first and second sub-period respectively and $(n_1 + n_2 - 2K)$ the degrees of freedom in the unrestricted case. This statistic is then compared, at the chosen level of significance, with the critical value of the F distribution with K and $(n_1 + n_2 - 2K)$ degrees of freedom.

Care should be exercised in the execution of the test, however, for it is all too easy to "fish" indiscriminately for break points in estimated relationships. One should really have some a priori reason for focusing on particular points in time as possible moments of structural break.⁽¹⁵⁾ Alas, when considering relationships in the labour market some, more or less strong, justification can be adduced for the choice of many years. However, attention has already been paid in the previous chapter to the possibility that the shake-out of labour in the mid to late 1960's productivity drive affected youths as well as adults. Given the usual finding that there was a shift in the relationship between aggregate employment and output, it seems reasonable to hypothesise that this also affected that between youth unemployment and GDP. Furthermore, as already argued - although so far inconclusively demonstrated - it seems unlikely that the shake-out will have been neutral as between age and sex groups. In particular, one might expect that those in the least skilled occupations, and implicitly therefore probably the young, will have

suffered relatively heavily. This provides grounds for assuming that the relationship between youth and adult unemployment may have been changed at this time. The work of the previous chapter, which employed a very simple model with shift dummies, will therefore be extended to examine whether the shake-out occasioned a break in the relationship between youth unemployment and its hypothesised determinants.

Of the other events that might have influenced the form of the youth unemployment relationship, ROSLA is one of the most interesting and also instructive. One might hypothesise that by (apparently) raising the average educational level of young people the enactment should have raised the attractiveness of young workers to employers, *ceteris paribus*. But, two sorts of problem bedevil the further pursuit of this issue with the limited data in use. The first of these is purely statistical and relates to the shortness of the period following ROSLA, which leaves insufficient degrees of freedom for any meaningful analysis to be undertaken. At a more substantive level, however, is the fact that ROSLA coincided with the first oil-crisis rendering an examination of its independent effect exceedingly difficult. (16)

Therefore, the present exercise will focus solely on the shake-out years. Furthermore, it will be selective in so much as the unemployment rate equations appear to perform adequately and attention will be directed to those modelling relative youth unemployment. This is justified further by the missing observations in the rate series which would cast doubts on the reliability of the equations for the second half of the data period. Given also that

three possible years will be examined for the timing of the potential effects of the shake-out, attention will further be restricted to four of the least well fitting equations: these being youths of both sexes including school-leavers relative to adult males at July, girls excluding school-leavers to women and boys excluding school-leavers to men both using January observations. But, to perform the exercise, the ROSLA dummy variable has to be dropped from the equations as it is identically zero in all first-time periods under consideration. Thus, not only would one not be comparing like with like if it were included, its coefficient cannot be estimated in these earlier epochs due to the variable having no variance. What effect this has for the model estimated over the full sample period will be assessed presently. For now it will merely be noted that it was previously significant only in those equations here being considered which exclude school-leavers.

As the details in Table 12 reveal, there is statistically significant evidence of structural instability in all equations examined, whichever year is proposed for the break. Whilst the precise timing differs somewhat, exactly the same phenomenon was discovered in the works of Merrilees and Wilson (1979) and Rice (1984). However, here there has been an attempt to highlight a specific, tangible event which may be responsible for the shift. The authors cited, and many others working in the disequilibrium mould,

TABLE 12

	F-STATISTIC FOR BREAK AT			CRITICAL VALUE OF F AT 5%
	1966	1967	1968	
Including School-Leavers				
Boys to Men July	7.38	7.37	2.83	2.83
Girls to Men July	4.78	9.39	9.28	2.66
Excluding School-Leavers				
Boys to Men January	2.96	3.89	6.65	2.70
Girls to Women January	4.69	8.71	8.22	2.85

do little by way of rationalising why the youth market, in particular, does not clear at a point in time, nor do they indicate why uni-directional disequilibrium should persist for long periods of time. Present evidence ^{is} consistent with the hypothesis that the labour dishoarding of the mid-to-late 1960's, prompted by the policies of the Wilson government of the day, caused a fundamental re-alignment of pre-existing labour market relationships.⁽¹⁷⁾ Consistency is not, of course, convincing proof of causality; but in the light of previous work on the "shake-out" it is perhaps surprising that the issue has not been explored more fully in the specific context of the youth unemployment debate.

Turning to the detailed findings of this exercise, Table 13 presents the results obtained for the full sample periods

TABLE 13

	C	RELATIVE EARNINGS	RELATIVE POPULATION	RELATIVE BENEFITS	GDP	Δ GDP	t	ρ	\bar{R}^2	D.W.
INCLUDING SCHOOL-LEAVERS										
BOYS TO MEN JULY 1953-1979	-0.177 (0.46)	0.667 (1.74)	1.521 ^(a) (1.34)	0.597 (0.38)	-0.009 (3.04)	0.005 (2.67)	0.017 (2.51)	0.868 (9.10)	0.347	1.307
BOYS TO MEN JULY 1953-1967	0.226 (3.72)	-0.509 (3.12)	1.672 ^(a) (7.19)	-1.048 (4.54)	0.003 (5.75)	-0.001 (2.16)	-0.006 (3.88)	-0.625 (2.37)	0.968	2.368
BOYS TO MEN JULY 1968-1979	1.982 (2.6)	0.230 (0.95)	4.230 ^(a) (3.59)	-8.436 (2.45)	-0.017 (6.57)	0.014 (6.07)	0.041 (5.66)	-0.677 (2.46)	0.983	2.743
GIRLS TO MEN JULY 1950-1979	-0.156 (0.38)	0.160 (0.69)	0.788 (0.78)	0.704 (0.45)	-0.005 ^(b) (2.28)		0.012 (2.75)	0.890 (11.57)	0.122	1.345

Continued

TABLE 13 (Continued)

	C	RELATIVE EARNINGS	RELATIVE POPULATION	RELATIVE BENEFITS	GDP	Δ GDP	t	ρ	\bar{R}^2	D.W.
GIRLS TO MEN JULY 1950-1966	0.236 (1.59)	-1.125 (3.62)	0.917 (2.16)	-0.122 (0.18)	0.002 (b) (1.33)		-0.004 (1.62)	0.209 (0.67)	0.408	1.603
GIRLS TO MEN JULY 1967-1979	0.752 (1.14)	0.714 (3.99)	2.330 (3.79)	-3.907 (1.56)	-0.017 (b) (8.57)		0.042 (9.45)	-0.689 (2.79)	0.980	2.709

T-STATISTICS IN PARENTHESES

(a) Youths 15-19/Adults 20-65

(b) GDP lagged one year

TABLE 13 (Continued)

	C	RELATIVE EARNINGS	RELATIVE POPULATION	RELATIVE BENEFITS	GDP	T	p	\bar{R}^2	D.W.
EXCLUDING SCHOOL-LEAVERS									
BOYS TO MEN JANUARY 1950-1979	-0.011 (0.11)	-0.205 (1.76)	0.088 (0.36)	0.449 (1.41)	0.0003 (0.59)	-0.0001 (0.03)	0.752 (5.94)	0.058	2.062
BOYS TO MEN JANUARY 1950-1967	0.106 (1.85)	-0.290 (2.34)	0.288 (1.56)	0.205 (0.73)	-0.001 (1.59)	0.004 (2.87)	0.012 (0.04)	0.722	1.937
BOYS TO MEN JANUARY 1968-1979	0.079 (1.23)	-0.122 (5.10)	-0.486 (5.32)	0.637 (2.58)	-0.002 (8.06)	0.006 (9.84)	-1.919 (0.00)	0.976	3.649
GIRLS TO WOMEN JANUARY 1953-1979	0.168 (0.94)	-0.519 (1.71)	0.182 ^(a) (0.15)		0.005 (1.44)	-0.010 (1.22)	0.646 (4.14)	-0.024	1.729

Continued

TABLE 13 (Continued)

	C	RELATIVE EARNINGS	RELATIVE POPULATION	RELATIVE BENEFITS	GDP	T	p	\bar{R}^2	D.W.
EXCLUDING SCHOOL-LEAVERS									
GIRLS TO WOMEN JANUARY 1953-1966	-0.234 (0.59)	-0.707 (0.79)	2.585 ^(a) (1.70)		0.001 (0.17)	-0.003 (0.46)	-0.255 (0.82)	0.847	2.023
GIRLS TO WOMEN JANUARY 1967-1979	0.762 (3.12)	-0.659 (2.867)	-10.088 ^(a) (3.08)		0.009 (2.82)	0.001 (0.11)	0.445 (1.57)	0.641	2.082

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(a) Youths 15-19/Adults 20-65

corresponding to those used above and for the consecutive sub-periods for which the F-statistics in Table 12 provided the strongest evidence for a structural break. Comparing first the full sample results excluding the ROSLA dummy with those obtained earlier, certain salient features emerge. The first is that the goodness of fit of all equations remains poor. However \bar{R}^2 has increased in the models including school-leavers whilst it has decreased in those which exclude them. Secondly, there are indications of instability in all four equations, although this is by far the most serious in the case of young to older males including school-leavers. In this instance four of the six true coefficients change sign and two of these are significant in the new estimates. Thirdly, whilst still performing poorly, the two models including school-leavers provide mild support for all prior hypotheses except for that focusing on GDP, the coefficient on which remains positive and also achieves significance in the male to male equation. Nevertheless, the poor overall performance and the evident instability are cause for concern.

When the sample period is split, the fundamental message to emerge is that one should proceed with extreme caution if attempting to draw firm conclusions from results obtained using the full data sample. In all cases it should first be noted that the models work far better on the sub-periods individually than when they are pooled - although this in some part will be a function of the reduction in the degrees of freedom in the former instances. Secondly, coefficient values and signs are most unstable. Furthermore, the patterns which emerge are not wholly in accord with what intuition might lead one to expect. For instance, if, as is

frequently argued, the early post-war period was one of excess demand for young labour why are all four relative population measures positively signed, and significant in two instances? However, the negatively signed relative earnings variables (three significantly so) do seem more in line with this hypothesis. But when considering all other regressors it is not clear that one should expect sign instability across regimes and yet in only two cases - unemployment benefits in the boys to men equation excluding school-leavers and GDP in the girls to women equation excluding school-leavers - does this not occur either between sub-periods or between sub-periods and the full sample. Nevertheless, whilst these findings offer a severe warning about the structural frailty of the relative unemployment relationships the next section goes on to examine one further possible cause of the perceived difficulties.

V. SIMULTANEOUS EQUATION BIAS

Up to now it has been assumed that unemployment could satisfactorily be analysed in a single equation framework. This could only ever represent an approximation to reality : simultaneity affects many, if not most, economic relationships. The question is, how serious is the bias introduced? A comprehensive approach to this issue cannot be attempted here, but some attention can be given to what might be regarded as the most likely feature of the model to generate such problems. This is the treatment of the earnings variables as exogeneous, particularly in view of the work undertaken in Chapter 3. The aim here, therefore, is to examine the performance of a model which estimates the unemployment and earnings

of young people relative to adults simultaneously. As the earlier discussion indicated, it is not possible to estimate the full earnings equation beyond 1972 and the present work must of necessity rely heavily on the simple market approach to earnings determination explored at the beginning of Chapter 3.

In deterministic form, the relative earnings equations used there, in an obvious shorthand, were

$$(1) \quad \text{REL } W = \alpha_0 + \alpha_1 \text{ GDP} + \alpha_2 \text{ REL. SUPP.} + \alpha_3 t$$

$$(2) \quad \text{REL } W = \beta_0 + \beta_1 \text{ REL. } U + \beta_2 t$$

where the relative unemployment variable in (2) - REL. U - was in terms of rates. The earlier work of this chapter has essentially considered relative, absolute, unemployment equations of the form

$$(3) \quad \text{REL } U = \gamma_0 + \gamma_1 \text{ REL } W + \gamma_2 \text{ GDP} + \gamma_3 \text{ REL SUPP} + \gamma_4 t + \gamma_5 Z$$

where Z is a sector of suppressed variables. This latter is not strictly of the same form as (2) but, by dividing through by the relative supply term similarity is achieved, as in

$$(4) \quad \text{REL } U = \delta_0 + \delta_1 \text{ REL } W + \delta_2 \text{ GDP} + \delta_3 t + \delta_4 Z$$

Consider first the general issues which arise when examining (1), (2) and (4).

Equations (1) and (4) represent a recursive system and, as such, single equation estimation techniques are appropriate.⁽¹⁸⁾ If, however, equations (2) and (4) were considered to represent an appropriate characterisation of the world then they represent a simultaneous system and should be estimated accordingly: this is the exercise to be undertaken here. But the problem of identification arises immediately. Thus, briefly, in a system of G linear equations the identification of an individual equation requires that it exclude at least $G-1$ variables in the model. This requirement, known as the order condition for identification, is, however, only necessary and not sufficient, but it is the cause of the problems in the current instance.⁽¹⁹⁾ The relative earnings equation does not include one variable which is excluded from the relative unemployment equation.

Recall, however, the discussion in Chapter 3. There, the extended consideration of the factors likely to influence relative earnings, over and above simple macro-economic aggregates, revealed that the average age of young people in the labour market was statistically one of the strongest. If it is assumed that ROSLA had a strong influence on this by removing 15 year olds from the market, then identification can be achieved; albeit in a slightly contrived manner. Thus, let (2) be modified to

$$(5) \text{ REL } W = \lambda_0 + \lambda_1 \text{ REL } U + \lambda_2 \text{ ROSLA1} + \lambda_3 t$$

where ROSLA1 is a dummy variable taking the value one from 1973 onwards and zero previously. Equations (4) and (5) now represent a simultaneous system wherein both are identified and they will form

those to be estimated as such here.

For the purposes of this exercise, attention will be restricted to the unemployment and earnings of young people relative to adult men. But immediately one is faced with the additional problem that, in the case of males, the age delimiters used in the unemployment and earnings equations differed when they were estimated above. The choice had to be made in their case therefore between defining adulthood at 18 or 20 years. Using the latter acts as a partial check that the poor unemployment results were not just due to the particular data set based on the 18 year old definition and is also the definition which is the more appropriate for the relative earnings equation. But, as stated earlier, no official annual estimates of the numbers in the labour force aged less than 20 have been published beyond 1972, thereby posing problems for the creation of an unemployment rate series for this group. However, Wells (1983) produced semi-official annual estimates of their mid-year percentage unemployment, both including and excluding school-leavers, and these will be utilised here.⁽²⁰⁾ Additionally, his estimates of the unemployment rate of young females aged less than 18 will be substituted for the earlier data to provide a check in their case also. It must be borne in mind, however, that Wells, at several points in his work, acknowledges the tentative nature of his figures. But this said, his data does provide a complete, annual unemployment series from 1952 onwards, which, in the light of the foregoing work, will be terminated in 1979.

Whilst the primary purpose of this section is the estimation of

the simultaneous model discussed above; as there are differences in the form of the equations, the definition of the unemployment variables and in the sample period, single equation estimates are first presented in order to see what the effects are on previous conclusions. In the case of the simple earnings model, Table 14 shows that these are considerable for young males, whether school-leavers are included in the relative unemployment term or not. From earlier being weakly significant and negative the inclusion of the ROSLA step dummy renders the labour market pressure variable positive in both cases and significant in the preferred formulation including school-leavers. This, of course, runs counter to prior hypothesising and suggests, accepting the results at face value, that, having taken account of the secular trend and the like here being attributed to ROSLA, compositional forces may be at work. That is, the least skilled, and therefore lowest paid, groups have the most cyclically sensitive unemployment with wage structures (although not necessarily wage levels) being relatively rigid. Exactly the same picture emerges in the relative earnings equations for young females; although this does not contrast with the results obtained earlier.⁽²¹⁾

However, if earnings and unemployment are simultaneously determined, as is here being explored, then the above could be the result of simultaneous equation bias. To see this take the generalised earnings and unemployment equations

$$(6) \quad w = \alpha_0 + \alpha_1 U + \alpha_2 Z^w + v_0$$

$$(7) \quad U = \beta_0 + \beta_1 w + \beta_2 Z^U + v_1$$

TABLE 14

YOUTH TO ADULT MALE EARNINGS, WELLS UNEMPLOYMENT DATA 1952-1979

	C	RELATIVE UNEMPLOYMENT EXCLUDING SCHOOL- LEAVERS	RELATIVE UNEMPLOYMENT INCLUDING SCHOOL- LEAVERS	RDSLA1	T	p	\bar{R}^2	D.W.
BOYS TO MEN	0.412 (65.12)	0.016 (2.6)		0.036 (5.95)	0.004 (10.71)	0.373 (1.99)	0.972	1.621
BOYS TO MEN	0.415 (58.81)		0.016 (1.69)	0.037 (5.70)	0.433 (8.67)	0.448 (2.51)	0.967	1.624
GIRLS TO MEN	0.374 (115.59)	0.006 (2.67)		0.058 (10.99)	0.001 (3.10)	-0.239 (1.21)	0.980	2.061
GIRLS TO MEN	0.374 (84.69)		0.011 (1.77)	0.061 (10.05)	0.001 (2.83)	-0.186 (0.92)	0.964	1.983

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where w and U represent relative earnings and unemployment respectively, the Z 's being vectors of exogeneous variables and v_0 and v_1 error terms. Solving for U gives

$$(8) \quad U = \frac{\alpha_0 \beta_1 + \beta_0}{1 - \alpha_1} + \frac{\alpha_2 \beta_1}{1 - \alpha_1} Z^w + \frac{\beta_2}{1 - \alpha_1} Z^U + \frac{\beta_1}{1 - \alpha_1} v_0 + \frac{v_1}{1 - \alpha_1}$$

Thus U is related to the error term in the earnings equation, v_0 , by the coefficient $\beta_1/1 - \alpha_1$. The true values of the elements of this have been assumed to be

$$\beta_1 > 0, \alpha_1 < 0$$

which, if true, imply

$$\frac{\beta_1}{1 - \alpha_1} > 0$$

that is that U and v_0 are positively correlated. As most econometric texts show (e.g. Koutsoyiannis (1976)), this implies that the coefficient on U will be upwards biased, which may go some way to explaining the perverse results obtained in the single-equation estimation of the earnings function above.

Nevertheless, to perservere with the single equation comparisons for the moment, Table 15 presents the new estimates for the relative unemployment models. Recalling that Wells only presents mid-year

TABLE 1.5
 YOUTH TO ADULT UNEMPLOYMENT RATES, WELLS UNEMPLOYMENT DATA 1952-1979

	C	RELATIVE EARNINGS	RELATIVE BENEFITS	ROSLA	GDP	GDP	T	ρ	R^2	D.W.	L.L.
BOYS INCLUDING SCHOOL-LEAVERS	3.057 (1.02)	1.906 (0.64)	10.704 (0.83)	0.222 (1.58)	-0.126 (5.12)		0.299 (5.35)	0.885 (10.78)	0.620	1.661	20.769
BOYS INCLUDING SCHOOL-LEAVERS	4.056 (1.36)	2.724 (0.900)	7.360 (0.58)	0.149 (1.02)	-0.138 (5.47)	0.018 (1.37)	0.316 (5.69)	0.912 (13.09)	0.628	1.721	21.932
BOYS EXCLUDING SCHOOL-LEAVERS	3.578 (1.54)	0.251 (0.11)	5.098 (0.51)	0.240 (2.21)	-0.096 (5.08)		0.234 (5.44)	0.884 (10.81)	0.585	1.869	28.007
BOYS EXCLUDING SCHOOL-LEAVERS	3.878 (1.62)	0.552 (0.23)	4.056 (0.40)	0.216 (1.82)	-0.100 (4.93)	0.006 (0.58)	0.240 (5.38)	0.893 (11.41)	0.570	1.846	28.214
GIRLS INCLUDING SCHOOL-LEAVERS	3.566 (0.55)	2.511 (0.57)	47.226 (1.63)	0.432 (1.40)	-0.174 (2.94)		0.423 (3.41)	0.916 (13.70)	0.278	1.104	-1.379
GIRLS INCLUDING SCHOOL-LEAVERS	-2.090 (0.32)	4.147 (0.90)	44.608 (1.56)	0.302 (0.94)	-0.206 (3.206)	0.037 (1.21)	0.479 (3.64)	0.923 (14.64)	0.287	1.312	-0.441

Continued

TABLE 15 (Continued)

	C	RELATIVE EARNINGS	RELATIVE BENEFITS	ROSLA	GDP	GDP	T	p	R ²	D.W.	L.L.
GIRLS EXCLUDING SCHOOL-LEAVERS	-1.484 (0.42)	0.571 (0.24)	25.613 (1.63)	0.329 (1.96)	-0.094 (2.93)		0.219 (3.28)	0.883 (10.45)	0.283	1.582	16.171
GIRLS EXCLUDING SCHOOL-LEAVERS	-1.164 (0.32)	0.758 (0.30)	24.875 (1.55)	0.309 (1.71)	-0.099 (2.76)	0.006 (0.33)	0.227 (3.11)	0.892 (10.83)	0.248	1.634	16.248

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estimates of unemployment, the central issue was that of the timing of the regressors. Experimentation with simple lag structures revealed no significant changes or improvements and therefore all variables are current year dated with the relative benefits measure referring to those receivable at July of that year, ROSLA being the dummy attempting to capture the hypothesised one year only effect of that measure and equations are reported both including and excluding the percentage change in GDP. Because of the numerous, albeit apparently minor, differences between the present model and those developed for young people aged less than 18, hard and fast comparisons are not strictly valid. However, by reference to the overall goodness of fit, the present versions do give the impression of performing somewhat better than those reported above. This is particularly true for males although, even in their case, in a time-series context the \bar{R}^2 's are not perhaps as high as one would hope for.

Looking briefly at the detailed results, one can note firstly that current output is now not only correctly signed but also significant in all cases. The percentage change in GDP, however, still exhibits the perverse positive coefficient whenever it is included. But it is never significant and application of the likelihood ratio test supports the conclusion that the omission of Δ GDP would be a valid restriction. This test is conducted by comparing $-2 \log_e \lambda$, where

$$\lambda = \frac{L(\theta^R)}{L(\theta)}$$

and $L(\theta^R)$ is the likelihood function when the restrictions to be tested are imposed and $L(\theta)$ is the unrestricted likelihood function, with the chi-square statistic with degrees of freedom equal to the number of restrictions at the desired confidence level. In the present case the number of restrictions is one (setting the coefficient on ΔGDP to zero) and clearly it can be accepted at even the 90 per level ($\chi^2 = 2.71$) in all four cases.

Both the relative earnings and relative benefits variables are now always correctly signed, although, particularly in the case of the former, they are statistically weak. The ROSLA dummy variable is also always of the same sign, but the direction is counter to prior hypothesising. Finally, the time trend is highly significant and positive in all cases, indicating that the unemployment rates of young males less than 20 and young females less than 18 have been upward trended relative to that of males aged 20 and over for reasons not identified by the proposed model. Such instability in the face of what seemed reasonably small specification changes is somewhat disturbing. Unfortunately, it is not possible to identify with any precision which of these are responsible, but the most pessimistic is possibly that the differences are due to the experiences of young people at different ages being dissimilar. The youth unemployment problem certainly affects all under the age of 20 and common rationalisation would be most welcome. Without this the available time-series data probably does not possess sufficient degrees of freedom to allow a satisfactory disaggregated picture to emerge and, as will be the case below, recourse will need to be made to alternative sources of information. But, to return to the stated

purpose of this section, the simultaneity issue is now examined directly to see if it can throw further light onto the analysis of youth unemployment.

Several techniques are available for this purpose, including three stage least squares and maximum likelihood, but most rely on all equations in the system being correctly specified. If they are not then the errors in any one equation are transmitted to all the others. In recognition of the stringency of this requirement, two-stage least squares (TSLS) was the technique adopted. This eliminates simultaneous equation bias whilst working on each equation separately; therefore, one mis-specified relationship does not affect all others. The particular method employed contains a serial correlation correction and follows Fair (1970) in that lagged dependent and independent variables are automatically entered in the list of instruments to ensure that consistent estimates are obtained, which requires that the first observation is dropped.

Tables 16 and 17 present the results obtained from estimating the relative unemployment and earnings equations by this method of TSLS. It is clear, however, that what changes are evidenced over the single equation results do not serve to materially alter previous conclusions, save that Δ GDP now generally re-emerges as a significant influence that is signed contrary to prior expectation.⁽²²⁾ In particular, neither relative earnings in the unemployment equations nor relative unemployment in the earnings equations perform at all well. The former is of the correct sign in all but one instance, but never really approaches significance, whilst the latter is always incorrectly signed and significant. In

TABLE 16
SIMULTANEOUS RELATIVE UNEMPLOYMENT AND EARNINGS ESTIMATES, YOUNG MALES, 1953-1979

	C	RELATIVE EARNINGS	RELATIVE UNEMPLOYMENT	RELATIVE BENEFITS	ROSLA	ROSLA1	GDP	Δ GDP	T	ρ	RSS	D.W.
BOYS UNEMPLOYED INCLUDING SCHOOL-LEAVERS	-0.176 (0.04)	1.276 (0.31)		9.215 (0.66)	0.224 (1.48)		-0.126 (4.74)		0.329 (5.30)	0.998 (312.17)	0.431	1.561
RELATIVE EARNINGS	0.403 (61.55)		0.028 (4.04)			0.033 (5.05)			0.004 (9.31)	0.306 (1.56)	0.001	1.672
BOYS UNEMPLOYED INCLUDING SCHOOL-LEAVERS	3.737 (1.21)	4.666 (1.24)		5.467 (0.43)	0.087 (0.57)		-0.145 (5.63)	0.032 (2.01)	0.330 (5.62)	0.880 (9.73)	0.303	1.618
RELATIVE EARNINGS	0.404 (63.12)		0.026 (3.95)			0.034 (5.36)			0.004 (9.67)	0.314 (1.60)	0.011	1.672
BOYS UNEMPLOYED EXCLUDING SCHOOL-LEAVERS	1.484 (0.44)	-0.647 (0.20)		3.881 (0.36)	0.242 (2.07)		-0.096 (4.69)		0.258 (5.38)	0.997 (257.69)	0.258	1.850
RELATIVE EARNINGS	0.399 (44.47)		0.054 (3.20)			0.033 (4.11)			0.003 (4.27)	0.303 (1.56)	0.002	1.755

Continued

TABLE 16 (Continued)

	C	RELATIVE EARNINGS	RELATIVE UNEMPLOYMENT	RELATIVE BENEFITS	ROSLA	ROSLAI	GDP	ΔGDP	T	P	RSS	O.W.
BOYS UNEMPLOYED EXCLUDING	3.759 (1.50)	1.547 (0.50)		2.858 (0.27)	0.177 (1.43)		-0.105 (4.99)	0.014 (1.11)	0.250 (5.24)	0.865 (9.08)	0.198	1.793
RELATIVE EARNINGS	0.403 (52.64)		0.041 (3.11)			0.037 (5.41)			0.003 (5.80)	0.336 (1.76)	0.001	1.749

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TABLE 17
SIMULTANEOUS RELATIVE UNEMPLOYMENT AND EARNINGS ESTIMATES YOUNG FEMALES 1953-1979

	C	RELATIVE EARNINGS	RELATIVE UNEMPLOYMENT	RELATIVE BENEFITS	ROSLA	ROSLA1	GDP	ΔGDP	T	ρ	RSS	D.W.
GIRLS UNEMPLOYED INCLUDING SCHOOL-LEAVERS RELATIVE EARNINGS	-7.047 (0.93)	2.979 (0.63)	0.008 (3.20)	46.415 (1.58)	0.431 (1.39)	0.058 (11.11)	-0.715 (2.90)		0.495 (3.99)	0.990 (78.21)	1.743	0.938
GIRLS UNEMPLOYED INCLUDING SCHOOL-LEAVERS RELATIVE EARNINGS	0.374 (98.29)								0.001 (2.54)	0.0238 (1.20)	0.001	2.109
GIRLS UNEMPLOYED INCLUDING SCHOOL-LEAVERS RELATIVE EARNINGS	-1.325 (0.22)	7.213 (1.62)	0.008 (3.15)	39.461 (1.52)	0.082 (0.27)	0.058 (11.17)	-0.257 (4.24)	0.097 (2.93)	0.633 (5.04)	0.942 (15.14)	1.240	1.322
GIRLS UNEMPLOYED INCLUDING SCHOOL-LEAVERS RELATIVE EARNINGS	0.374 (98.38)								0.001 (2.55)	-0.238 (1.20)	0.001	2.105
GIRLS UNEMPLOYED EXCLUDING SCHOOL-LEAVERS RELATIVE EARNINGS	-2.073 (0.67)	1.568 (0.70)	0.019 (2.78)	25.472 (1.82)	0.335 (2.23)		-0.099 (3.42)		0.245 (4.12)	0.863 (6.79)	0.366	1.167
GIRLS UNEMPLOYED EXCLUDING SCHOOL-LEAVERS RELATIVE EARNINGS	0.372 (80.48)					0.057 (9.19)			0.0004 (2.14)	-0.226 (1.13)	0.001	2.098

Continued

TABLE 17. (Continued)

	C	RELATIVE EARNINGS	RELATIVE UNEMPLOYMENT	RELATIVE BENEFITS	ROSLA	ROSLA1	GDP	Δ GDP	T	ρ	RSS	D.W.
GIRLS UNEMPLOYED EXCLUDING SCHOOL-LEAVERS	-0.723 (0.25)	2.815 (1.29)		23.266 (1.81)	0.196 (1.32)		-0.128 (4.27)	0.037 (2.27)	0.298 (4.86)	0.870 (9.392)	0.293	1.306
RELATIVE EARNINGS	0.372 (80.56)		0.019 (2.76)			0.057 (9.22)			0.0005 (2.15)	-0.226 (1.13)	0.001	2.097

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addition, the changes brought about in the coefficients of the remaining regressors are not such as to bring into question earlier findings.

It is, of course, possible that the economic hypotheses which the analysis set out to test are correct and that the econometric methodology employed is inappropriate. Thus, in the single equation models the bulk of the work was done by GDP, ROSLA1 and the time trends which perhaps implies that ^{it} is inappropriate to expect strong simultaneity effects on the part of earnings and unemployment. Furthermore, whilst two equations were estimated by simultaneous methods, a full model of the youth labour market would comprise many other elements. But such a model appears far from being developed and, for the present, it seems preferable to take the rather negative findings on the simultaneity hypothesis as further indication that the behaviour of aggregate time-series youth unemployment is not readily the subject of robust explanation.

VI. CONCLUSION

There is a strong predilection in empirical work to close with fairly strong conclusions and past studies of time-series British youth unemployment provide no exception to this. If the aim of the exercises were merely academic then this might not be considered too damaging, although, even if this were true, a further statement of the more negative findings encountered in the course of the research would, on occasion, probably arouse genuine interest. However, the catch-phrase, most commonly encountered is that the research is "policy-orientated". Whenever this is taken at face value then it is

surely appropriate to report a broader cross-section of findings than seems usual. To support such an appeal, the present analysis produced a series of decidedly mixed results which do little to inspire confidence in any assertion that the answer to the present youth unemployment problem has, or can be, gleaned from the aggregate time-series data that is currently available.

Taking the period 1950-1982 as a whole it would appear that a fairly conventional model was capable of tracking reasonably well the percentage rate of youth unemployment, particularly when relative as opposed to real earnings were included amongst the vector of regressors, but failed to fit at all well when applied to an attempted explanation of the level of youth unemployment relative to that of adults. However, even in the former instance not all specific hypotheses met with satisfactory statistical success. Those which were appeared to indicate that young people are substitutes for adult males, complements for part-time females and have an unemployment rate strongly inversely related to the cycle (as measured by GDP).

But neither rate nor relative unemployment equations predicted the observations for 1980-1982 at all well when the primary estimation period was truncated at 1979. It is not possible to determine what weight to attach to the changes in the definition of the earnings data employed, the unprecedented peace-time level of direct government intervention in the labour market in these later years and the extreme depth of the present recession in generating this result. But the possibility that serious instability was still being masked could not be ignored. Whilst this fear could

legitimately be expressed in all cases, attention was focused in the further investigation of this issue on four of the worst fitting relative unemployment models.

Concentrating on the shake-out years of the mid to late 1960's, when so many labour market relations have been observed to have broken down, quite strong evidence was produced (in the form of Chow tests) to support the argument that the same fate befell the link between youth unemployment and its determinants. Furthermore, the results from estimating the equations under scrutiny for the two sub-periods were not wholly supportive of the notion that the early post-war period can be classified as one of excess demand whilst later years uniformly constitute a regime of excess supply. But, nevertheless, the models performed much better overall when the sample period was split than when it was regarded as a homogeneous entity. This finding could have constituted a legitimate conclusion to the enquiry, but it seemed desirable to investigate one further possible cause of the rather weak findings; this being the possibility that they were being adversely affected by simultaneous equation bias.

Whilst the simultaneous equation modelling exercise undertaken in Section V was clearly tentative and subject to reservation it was sufficient to show that simple simultaneous estimation of youths' relative unemployment and earnings does not provide the desired escape from the problems manifest in the single equation analysis. Indeed, as this extension of the work called for the use of somewhat different unemployment data to that used previously, it actually added to the already quite strong reservations about the stability properties of the chosen youth unemployment model by generating a

different pattern of results again when the included equations were estimated singly. Thus, in all, the results obtained suggest that extreme care would need to be exercised in translating historical experience into policy guidance for the alleviation of the 1980's youth labour market problem.

But, lest this sound overly gloomy, the strongest and most consistent finding of this study was that the fortunes of youth in the labour market have been strongly pro-cyclical and one must hope that the same remains true today.⁽²³⁾ Equally, however, no clear support was unearthed for those who argue that relative youth wages are the cause of the problem and argue, for instance, for the abolition of the Wage Councils, or for those who look to the reform of the unemployment benefit system as the likely panacea. But it must also be borne in mind that the dummy variables used in an attempt to capture the potential effects of ROSLA did indicate quite strongly that there was a significant shock to the system in the mid 1970's. Clearly, the present exercise did not exhaust all analytical possibilities and there remains much need, and scope, for further research; providing only that the caveats attached at each exercise are carefully made explicit.⁽²⁴⁾

- (1) Experimentation with lagged earnings measures might be justified because the figures relate to October, which is later than either of the unemployment series. Furthermore, wage agreements are scattered throughout the year and there can be no presumption that either current or lagged earnings figures are the correct ones to employ. But the caveats regarding lag structures, discussed in Chapter 3, still need to be borne in mind.
- (2) Based on the boys January equation the elasticity of percentage unemployment with respect to the index of GDP evaluated at 1982 is -5.8.
- (3) With annual data one normally expects the first order autoregressive process to be a reasonable approximation. If one uses shorter intervalled data then seasonality problems tend to arise which call for n^{th} ($n > 1$) order correction.
- (4) See Abowd et. al. (1981) for an instance when this problem is ignored and Hart (1984) for a more detailed treatment of the topic.
- (5) Although note that the contract theory literature, discussed in Chapter 2, suggests that such benefits (if exogeneously financed) may generate a greater willingness amongst employers to lay workers off.
- (6) Note that the negative coefficient on the part-time earnings variable could be consistent with ongoing excess demand for such workers who when sucked into employment through (non-market clearing) wage increases displace youths. The two groups might then be called substitutes.
- (7) This instability should be of some concern when previous studies have produced few, if any, comparative results to their preferred findings.
- (8) Nevertheless this is somewhat less than the 52.3% of females aged 55-59 still in the labour market.
- (9) Note that unemployed students have been netted out of the adult figures. See the data appendix for precise details.
- (10) It is to be noted that in the process of conducting this statistical analysis a computing error revealed that if the 1974 data observations were excluded the performance of the equations improves noticeably. There is, of course, no justification for such an exclusion, but the sensitivity is nevertheless disturbing.
- (11) Some detail on the numbers involved in government job creation measures over the period 1976-1981 can be found in Bowers (1984).

- (12) That is, assuming school-leavers constitute a non-competing group appears unjustified.
- (13) But this is not to say that the measures have had no effect on youth unemployment.
- (14) In principle, this set is only lower bounded (at one).
- (15) In general this will only be an approximation as relationships are likely to breakdown, or change, gradually.
- (16) Whilst small scale, ROSLA was quickly followed by the first of the direct job creation measures in 1975 - the Job Creation Programme and the Recruitment Subsidy for School Leavers.
- (17) The present Thatcher administration is, of course, engaged in a similar exercise of "trimming the fat" off British industry.
- (18) The results of estimating (1) by first order auto-regressive techniques for 1950-1979 are given in Appendix Table A1. Whilst the explanatory power seems good, note the poor performance of the population terms and the eclipse of GDP when a time trend is incorporated.
- (19) The additional, sufficient, rank condition for identification stipulates that an equation is identified if and only if at least one non-zero determinant of order $(G-1) \times (G-1)$ is contained in the array of excluded coefficients. For more detail on identification see, for example, Johnston (1972).
- (20) The series excluding school-leavers suffer from the problem discussed earlier when unemployment rates for those aged less than 18 were being constructed and is accordingly to be regarded with some suspicion.
- (21) But, whether the results can satisfactorily be rationalised or not, the equations, historically at least, track the data well.
- (22) Precise "goodness of fit" comparisons are not possible with the single equation estimates as the appropriate statistic cannot be produced for individual equations in a system. Indeed, most standard computer packages, including TSP used here, do not even estimate them for the system as a whole. On this see Dhrymes (1974).
- (23) Nevertheless, the puzzle remains over the frequent positive signing of Δ GDP.

- (24) One fairly popular analytical device was consciously not adopted here, which is that of expressing estimating equations in logarithmic form. Quite simply the reason for this is that there appear to be no grounds for assuming the existence of a Cobb-Douglas reduced form unemployment technology.

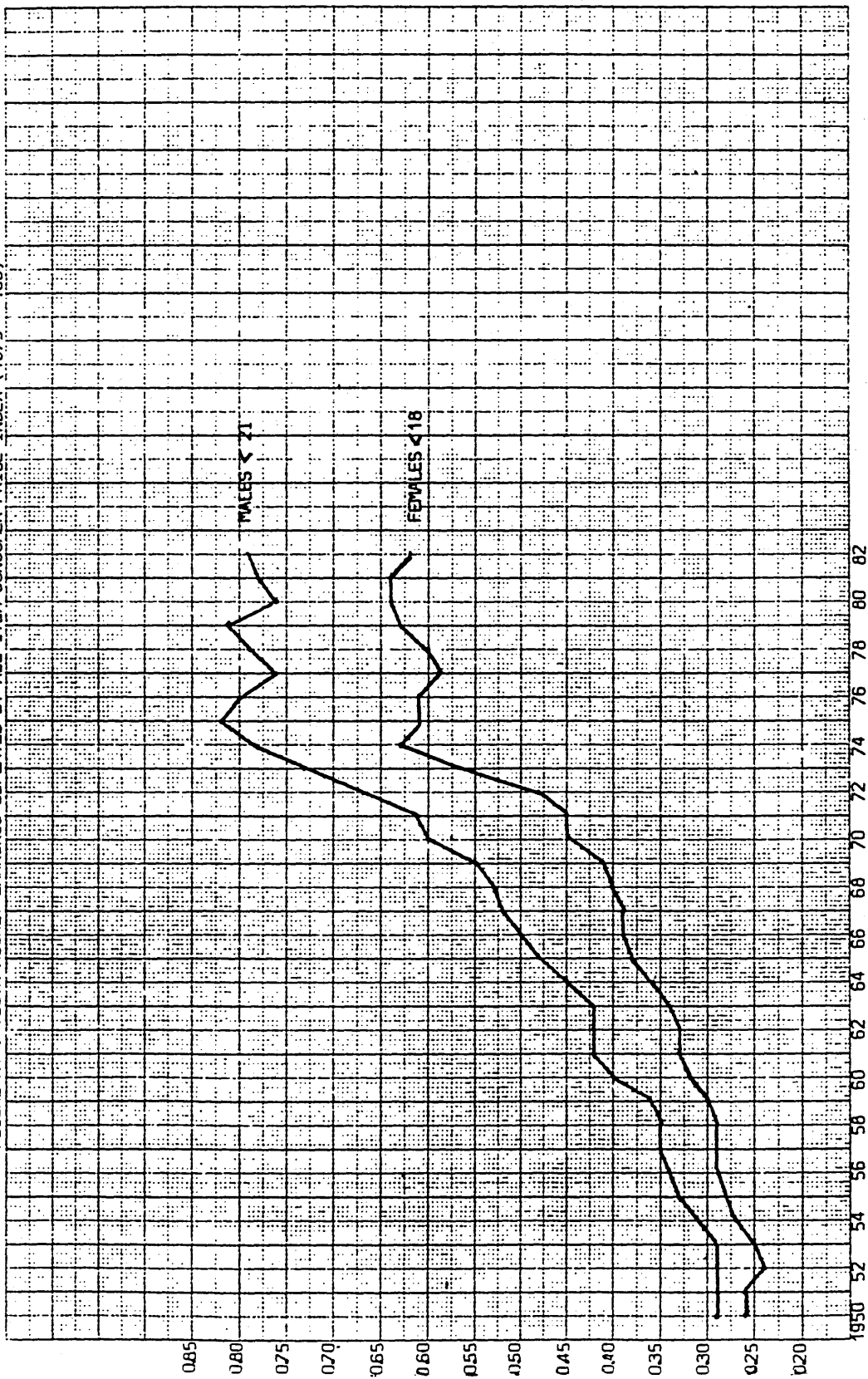
TABLE A.1

REGRESSIONS FOR BOYS EARNINGS RELATIVE TO ADULT MEN 1950-1979

CONSTANT	GDP	POP. 1	POP. 2	t	\bar{R}^2	D.W.	ρ
0.3166 (4.12)	0.0026 (4.71)	-0.0335 (0.07)			0.91	1.00	0.86 (10.29)
0.4285 (4.45)	0.0009 (0.85)	-0.2393 (0.53)		0.0042 (1.80)	0.92	1.13	0.87 (10.50)
0.2765 (5.20)	0.0027 (5.25)		0.1842 (0.31)		0.92	0.86	0.84 (8.82)
0.4094 (5.16)	0.0006 (0.51)		-0.3219 (0.53)	0.0057 (2.15)	0.93	0.97	0.83 (8.27)

T-STATISTICS IN PARENTHESES

FIGURE A1 : YOUTH HOURLY EARNINGS DEFLATED BY ALL ITEM CONSUMER PRICE INDEX (1975 = 100)



APPENDIX

Average Hourly Earnings	As defined in Chapter 3 Appendix
GDP Index (1975 = 100)	
Population by Age	OPCS Registrar Generals Population Estimates (Unpublished)
Price Level (1975 = 100)	Economic Trends
Labour Force by Age	As defined in Chapter 3 Appendix for 1950-1972 inc., Unemployment Age-Rate Analysis, D.E. Gazette 1975 onwards
Unemployment by Age Sections I-IV	D.E. Gazette, relevant issues. Adult Students excluded 1968 onwards. Assumed zero prior to to this date as in D.E. Gazette Unemployment Series.
Unemployment by Age Section V	Wells (1983)
Unemployment Benefits	Supplementary Benefits for single youths and for married man with 2 children and spouse present - social security statistics
ROSLA	Dummy variable taking value 1 in 1973, 0 all other years
ROSLA1	Dummy variable taking value 1 1973 onwards, 0 previously

CHAPTER 7

YOUTH UNEMPLOYMENT : A CROSS-SECTIONAL,
MICRO PERSPECTIVE

I. INTRODUCTION

The previous two chapters attempted to show how the level of youth unemployment is determined at any moment in time, but no insight was provided into how that unemployment would be distributed amongst the young population in the labour market. If the incidence of unemployment amongst them were known to be random then such an inquiry would be devoid of content. However, all studies confirm the intuitive belief that this is not the case, with individual and environmental characteristics being important influences on labour market fortunes.⁽¹⁾ At present, detailed progress in this area, in Britain and most other countries, requires that attention be focused upon cross-sectional information, due to the highly aggregated nature of the available, reliable time series data.⁽²⁾ In the case of young people, such work is still in its infancy in this country, save at the descriptive level, with Lynch (1983, 1984) being perhaps the most notable exceptions.⁽³⁾ The aim here, therefore, is to take a further look at this issue and ask which characteristics and circumstances would appear, from a priori reasoning, to render one particular type of young person more prone to unemployment at a moment of time than another, and consequently to assess the apparent statistical significance of the hypotheses generated.

Such an exercise has clear academic interest but, equally clearly, may have important policy implications. Thus sufficient may be known to determine a level of youth unemployment that is consistent with the achievement of an overall government policy-outcome mix. However, as the current interest in "the inner-city problem" shows, disquiet may then be shown about its incidence.⁽⁴⁾ But beyond the, presumably at least partially, unforeseen problems

which concentrated unemployment may carry in its wake, a knowledge of the distribution of the risks of unemployment could convey important economic benefits in its own right. Firstly, there is the question of equity : it may be held to be unjustifiable that some groups bear a heavier burden than others. Secondly, if it can be ascertained how unemployment is distributed this might provide policy-makers with an alternative to macro-economic reflation in the attempt to reduce its overall level.

Nevertheless, whilst these two issues are separable in principle, at least one of the simple policy remedies to suggest itself in both cases, namely subsidisation, is the same, thereby serving to blur the distinction. Whilst this by no means exhausts the possibilities, many of the alternatives encounter the same type of problems in execution. Thus, if the cost of one group's labour is reduced, this is likely not only to invoke gross output effects and the general substitution of labour for capital but also the substitution of the subsidised labour for other workers. Such costs have to be incorporated into any reasoned evaluation of policy proposals of this type.⁽⁵⁾

As said, the methodology to be adopted involves a discussion of the factors which theory and previous research suggest are likely to be important determinants of the likelihood that any young labour market participant be unemployed at a moment of time, followed by statistical testing of the derived hypotheses. In this, the work follows established cross-sectional research practice. However, there are clearly certain very real problems attached to the exercise. As the data base is a non-random sample of the entire

population, the results obtained may be subject to sample selection bias. Even without sampling problems, however, it is less than reasonable to take as read an assumption that the world is static and that the results from one year's data will serve to characterise the situation at all other points in time.

Unfortunately, there is little that can be done about the first caveat, although it is possible to some extent to guard against the second potential objection. Thus one can check the integrity of the findings from one year's data by replicating the exercise in one, or more, other years.⁽⁶⁾ But, theoretically, there is no clear guide available as to how these years should be chosen and, in practice, there are severe restrictions on how they can be selected. Whilst growing, the available data banks which contain labour market information are limited in number. Those which do exist are comparatively recent and their format has been evolving through time, hence limiting further the years over which models can be replicated. Nevertheless, choices remain to be made.

The first choice relates to the data source and for present purposes the General Household Survey (GHS) was selected. Whilst, this is not strictly a labour market survey, it does contain a reasonable amount of usable information on the labour market status of individuals, along with considerable data on their personal characteristics and circumstances. Secondly, it is a comparatively accessible and tested statistical source, going back as it does to

1971. However, in its most usable format (the Surrey sub-set) the GHS is only available for a limited number of the years in which it was conducted.⁽⁷⁾ Also, choice of comparator years is restricted by changes in the design of the questionnaire itself. Thirdly, no attempt is made in the GHS to discover whether people are employed on one of the government's special employment measures.⁽⁸⁾ On the assumption that this creates potentially serious problems in the case of young people from the inception of the Youth Opportunities Programme in April 1978, this leaves the survey of that year as the terminal one for analysis.⁽⁹⁾ At the other extreme the potentially distorting effects of ROSLA serve to make 1974 the earliest available usable inquiry for present purposes.

It is unlikely that a five year period will suffice to pick up fundamental structural shifts. However, by concentrating on the two extreme years one is able to study one, seemingly inherent, dynamic feature of unplanned economies; namely the cycle. Neither study year represents a turning point in this context, although the economy was on the down-slide through the period, with the unemployment recorded in the GHS approximately doubling, and one may talk in terms of comparative boom and slump.⁽¹⁰⁾ Theory and intuition suggest that the cycle will have non-neutral effects; those with least human capital, for example, being likely to suffer the most from recession. But the magnitude of the induced changes could be of considerable interest, not only in equity terms but also from the standpoint of economic efficiency, and might suggest the need for policies aimed at securing a more equal exposure to the rigours of economic life. However, this is a complex area best taken up again in the light of the empirical findings.

The model to be outlined below relates specifically to the determinants of the likelihood that a young person is out of work; albeit with the definition of youth expanded to include all between the ages of 16 and 24 inclusive.⁽¹¹⁾ As such it is in the spirit of Rees and Gray (1982) and Lynch (1983, 1984), with analogues looking at adults such as Nickell (1980). By adopting a focus that is particularly relevant to the circumstances of young people, it would be difficult to incorporate adults into the analysis as well. For example, the validity of hypotheses relating to educational attainment become questionable the older are the workers under consideration. But, notwithstanding such problems, expanding the sample to include older workers would increase its heterogeneity and call, at the least, for the inclusion of a large number of interaction terms in an attempt to control for this and to determine the specific "problem" characteristics of youths. That is, a simple linear age control is unlikely to capture the way in which different characteristics influence the likelihood of unemployment in different generations. Lastly, however, the computational requirements for the exercise assume considerable significance. This relates both to the data storage facilities required and to the processing time necessary for the performance of the statistical computations. The weight of argument therefore supports the imposed sample restriction.

Having outlined the purpose of this chapter, it is now necessary to expand on the issues which arise in the pursuit of the principal objective in order further to buttress the model building exercise. The next section therefore discusses the GHS data source and the restrictions this places on the models which can be tested. This

is then followed in Section III by a consideration of the characteristics deemed likely to influence the probability of unemployment amongst youths in the labour market. After a brief outline of the statistical methodology to be adopted, Section V then provides estimates of the proposed models. Finally, Section VI provides a summary and conclusions based on the preceding work.

II. THE DATA AND SAMPLE SELECTION

The GHS is reported by the Office of Population Censuses and Surveys (OPCS) annually and is based on interviews of a sample of the non-institutional population conducted continuously throughout the year. Addresses on the electoral register form the basis of the stratified random sample. By concentrating on the non-institutional population and the electoral register the GHS is known to under-sample the unemployed, but it does have the considerable advantage that both employed and unemployed are covered in the one survey and can easily therefore be compared.⁽¹²⁾

The aim was to concentrate specifically on the factors which might influence the probability of unemployment amongst young people who declared definite labour market attachment and did not claim ^{that} sickness was preventing them seeking work. It was also felt desirable to separate the sexes, rather than concentrate solely on males (e.g. Nickell (1980)), or to differentiate between them simply by a dummy variable (e.g. McCormick (1983)).⁽¹³⁾ To achieve satisfactory sample sizes it was decided to widen the definition of youth to encapsulate those aged between 16 and 24 years inclusive. As well as enlarging the sample, it is hoped that extending the

inclusion criterion in this way does not invalidate the arguments proposed below or introduce additional heterogeneity that cannot be controlled for simply by the use of a linear age variable. For 1974 this gave a total possible sample of 3163 (1811 males and 1352 females) and for 1978, 3309 individuals in total (1820 males and 1489 females), reduced by missing observations on the proposed regressors when the analysis is undertaken.

One element of the circumstances of young people which may serve to distinguish them, at least in degree, from other members of the labour-force is the relatively large proportion who live "at home". In many cases this will mean that the constraints facing such youths and those existing independently will differ (e.g. in the unemployment benefits receivable although, countervailingly perhaps, also in the level of direct family support available) and possibly also that their motivations will diverge. But, if one is to attempt to distinguish between the two groups in some way, then the problem of exactly what living "at home" means occurs immediately. As its name implies, the GHS is a survey of households, although the definition of household used by the OPCS - "a group of people living regularly at one address, who are all catered for by the same person for at least one meal a day" (Gilbert et. al. (1980 p.1.c)) - is not very useful for present purposes. It is impossible to deduce from it in individual cases whether a young person surveyed is in a position equivalent to that which it is sometimes assumed a young labour market participant residing in a nuclear family enjoys. Whilst even the advantages of being in this latter position (see Chapter 2 above and Casson (1979)) are seemingly based rather more on supposition

than hard evidence, some attempt at distinguishing between the two groups does seem desirable.⁽¹⁴⁾

The differentiating criterion used in the present exercise was based upon the respondent's relationship to the head of the household in which he or she resided at the time of interview. Specifically, the distinction was made between those who were themselves heads of households or who lived with non-relatives and those who were members of a household headed by a relative.⁽¹⁵⁾ In the paradigm case, one would expect this latter group to be more prone to unemployment than their independent peers and, as indicated below, this will be one of the specific hypotheses explored. But also, the model to be outlined was applied solely to that sub-group of the sample who resided with relatives in an attempt to reduce heterogeneity in this dimension. Whilst this approach might still be questioned, it will become clear from the ensuing discussion that the ideal analogue to the group which is being approximated to in the latter case above is the one to which some of the hypothesised influences on unemployment propensities most clearly refer.

III. UNEMPLOYMENT PROBABILITY : DETERMINANTS

This section aims to provide a systematic discussion of the influences likely to affect the probability that a youth was unemployed at the time of interview for the 1974 and 1978 GHS's, and to detail how they will be quantified given the data in use. To the greatest extent possible, identical measures will be used in both years so as to facilitate reasonably straightforward comparison of the two sets of results. As already stated in the previous section,

males and females will be considered separately and also two samples will be analysed; one using all possible observations and one restricted to those individuals living with relatives. The results for these 8 samples will then be presented in the following section.

A traditional approach to the specification of models attempting to explain economic phenomena would look to factors impinging separately on the demand and the supply sides of the market. In practice, however, this apparently neat bifurcation is often misleading and can lead to incomplete reasoning. This is certainly true in the case of the factors seemingly likely to determine which individuals are the most likely to be unemployed at a moment of time, for most can be argued to impact on both demand and supply. Abandoning this approach results in a certain loss of conceptual neatness and, whilst no alternative is likely to fully restore this, it seems desirable to attempt to impose some sort of structure to the discussion, however loose this may be. In this instance, the nine specific influences considered will be split into six that might be termed personal characteristics and three which might more properly be regarded as environmental controls. These factors will now be considered in turn.

IV.i AGE

The first standardisation made will be for the age of the individual respondent. By design, the study is focusing on young people and those incorporated satisfy at least one recognised official definition of youth. However, as discussed in Chapter 1, this is a grey area and any set of age delimiters is likely to

involve a certain amount of imposed heterogeneity. To the extent that any of this is correlated simply with the ageing process itself then the inclusion of this variable will serve as a simple, proximate control. On balance, it seems reasonable to hypothesise that youths will be the less likely to be unemployed the older they are. This is supported by arguments pertaining to both the supply and demand side of the market. Thus, as youngsters age it can be argued that they are more likely to have passed through the induction phase. Many may have found a niche, possess a long-term planning horizon and be less prone to impulsive quits. In turn, this reality, or signalling image, will make them more attractive to potential employers. Furthermore, to the extent that age is correlated with skill, this should also impact to render older youths less prone to unemployment; although, as noted below in the discussion of education, the presumption then about the duration of any particular spell of unemployment is not clear-cut. However, it should be remembered that, at least in 1977-78, embryonic job creation measures were already in force and may have been ameliorating these influences to some extent.

IV.ii EDUCATION

In the traditional view, based on Becker (1964), education leads directly to the accumulation of human capital and the enhancement of productivity. Psacharopoulos and Layard (1979) further provide evidence that increases in the level of schooling serve to raise the rate of return to future training. The more of this human capital that is firm specific the less likely are firms to make the worker

redundant and the less likely he is to quit, as detailed in Oi (1962) and Parsons (1972). As Nickell (1979c) argues, there is therefore an obvious link between the probability of an individual entering unemployment and the level of his education. However, it is to be noted that, this relates to unemployment incidence and the relationship with the duration of unemployment spells is not clear-cut. Indeed this latter may even go the other way as hiring and training costs are usually positively correlated with skill.⁽¹⁶⁾

Empirically, a slightly different approach has produced results which concur with Nickell's analysis. Thus Ashenfelter and Ham (1979) amongst others, have shown that additional schooling has a greater effect on earnings than on hourly rates of pay. Therefore, if hours of work are equal across individuals, and the labour supply literature often finds evidence of strong income effects in this regard, then this indicates less unemployment with greater schooling.⁽¹⁷⁾ Thus, by reducing the probability of unemployment schooling increases the private rate of return to education. But, as both Nickell (1979c) and Ashenfelter and Ham (1979) point out, its affect on the social rate of return is much more problematic. In particular, findings that education is negatively related to the probability of an individual becoming unemployed say nothing about the changes in the aggregate level of unemployment that would be brought about by raising an individual's educational level. It may in fact be the case that others then become more prone to unemployment, thereby making the social rate of return calculations less than straightforward.⁽¹⁸⁾

Before going on to consider how education may be measured, it should be noted that the human capital theorists' perspective on education is by no means universally accepted. Thus, in recent years, a literature has sprung up which considers the informational role of education, as opposed to its role in enhancing productivity. This is the job screening or market signalling work, to which early theoretical contributions were made by Arrow (1973), Spence (1974) and Stiglitz (1975). Appropriate empirical testing of the screening hypothesis is not easy, as Riley (1979) demonstrates, and most of the tests that have been performed look to evidence from earnings data.⁽¹⁹⁾ One exception to this appears to be the paper by Albrecht (1974), cited in Riley (1979), which applies the screening hypothesis to employment probabilities rather than earnings.

It might appear that the present work would be able to examine the issues raised in the latter framework. However, the current exercise does not have the power to discriminate between the screening and human capital hypotheses. Indeed, as Riley (1979) argues (p. 242), thorough testing really requires a longitudinal data set. The distinction between the two models will not therefore be pursued in greater detail; it merely being hypothesised that greater education should reduce the probability of unemployment, whilst accepting this is consistent with both human capital and screening interpretations of schooling.

The problem then becomes the empirical one of how to measure educational level. On the subject of education the GHS provides a wealth of information, but unfortunately it is not absolutely clear how it can all be incorporated into a study of this type. If one

measures education by qualifications obtained then even just considering the highest would generate an unwieldy number of dummy variables (16) and there would not appear to be any justification for attempting to construct an index of educational attainment. Furthermore, it is not possible with the Surrey sub-set to replicate, or satisfactorily approximate, the truncated hierarchy utilised by Layard et al. (1978). In the face of these problems, somewhat blunter measures of educational qualification will be employed in separate tests of the underlying hypothesis.

The first follows Nickell (1979c) and records whether the individual has obtained 'O' levels or above, the second distinguishes those with 'A' levels or above and the third simply distinguishes between those with and without any educational qualifications. But qualifications obtained are not the only, or indeed most prevalent, measure of the level of education used in the literature. Dating back at least to Mincer (1962), years of schooling have frequently been used to capture this influence. They here therefore represent the fourth test of the educational hypothesis where, as usual, years of education will be measured as the age at which an individual left school minus five.

IV.iii RACE

It is normal in studies of this type to make some attempt to control for ethnic background (e.g. Venti (1984)). The reasons given for such a control vary, ranging from differing work ethics through to labour market discrimination, but its inclusion always reflects casual observation that ethnic minorities fare less well, on

conventional criteria, in the labour market than others.⁽²⁰⁾ Furthermore, the variable is frequently found to be a statistically significant and unfavourable influence in studies taking account of factors other than race (e.g. Lynch (1983)), Rees and Gray (1982)). This practice will, therefore, be followed here, but before considering how this will be done a little more will be said about the issue of discrimination.

Discrimination as viewed by many economists is not an all-or-nothing concept, rather

"Money commonly used as a measuring rod, will also serve as a measure of discrimination. If an individual has a 'taste for discrimination', he must act as if he were willing to pay something, either directly or in the form of reduced income, to be associated with some persons instead of others. When actual discrimination occurs he must, in fact, either pay or forfeit income for this privilege. This simple way of looking at the matter gets at the essence of prejudice and discrimination".
(Becker (1971) p.14 italics in original).

If wages are fully flexible it then becomes harder to generate circumstances in which groups which are discriminated against by employers are, cet. par., less likely to gain employment than others. Furthermore, if the tastes of employers for discrimination differ, as reflected in the size of their (Beckerian) discrimination coefficients, market segregation appears as a likely outcome; a result which also follows for many forms of employee discrimination. But if wage differentiation is debarred by group then discrimination may affect employment probabilities, particularly in the face of overall labour market slack and the more nearly other groups are perfect substitutes for those which are the subject of the discrimination. To some extent the foregoing is a digression, but it should point to the danger of ascribing observed differences in labour market performance

simply to discrimination - when in fact the data is not adequate for a sufficiently rigorous examination of the issues to be undertaken.⁽²¹⁾

Colour, or nationality, need not be the only, or even most important, factor of this kind that may be important. In certain circumstances or countries, religion, for instance, may be more relevant. However, colour and nationality are two, non-independent variables on which the GHS provides a certain amount of information and racial issues of one form or another are frequently the focus of attention in British debates. But even so, there remains a degree of uncertainty regarding just what criterion measure one should adopt. In the present instance, therefore, three alternatives are examined.⁽²²⁾

The first of these is the colour of the respondent, which is a binary white/non-white variable. It should be noted that this characteristic is not self-assessed but rather is based on the judgement of the interviewer. As a first alternative to this a dummy variable indicating whether the individual was born inside or outside the U.K. will be introduced. Whilst this is again not a very sensitive measure, it would be statistically impossible to allow for every country of origin identified and any grouping convention other than that above would be subject to at least as many reservations. Finally, race will be measured by father's place of birth, defined analogously to own country of origin.

IV.iv HEALTH

It is fairly common practice to control for health in one way or another when conducting labour market studies. Very few, however, provide anything more than a fleeting justification for so doing and a hypothesis to the effect that illness will positively influence unemployment probabilities is not perhaps quite so obvious as it might at first appear; particularly in the context of most of the data sets which have so far been studied. This latter point will be taken up first.

Thus the GHS does not include the permanently institutionalised which thereby eliminates many of the chronically ill and disabled, either physically or mentally. Secondly, even within the non-institutionalised population, only those who are active in the labour force are currently under study, thereby removing more of this group. Thirdly, illness in the GHS is self-assessed with no independent verification being sought of interviewees' responses. Perhaps in this area especially one must therefore be somewhat wary. But note that the effect of this may be opposite to the two features noted above. That is, at its baldest, illness may be claimed as a cover for work shyness.

Turning from data considerations to those factors which might impinge on the unemployment probabilities of youths with health problems, the conclusions are once again not clear cut. In the first place, employers may believe that such workers' potential productivity is low. However, the Disabled Persons (Employment) Act 1944 imposed a three per cent quota for the employment of disabled

workers on all firms with 20 or more workers, which should serve to mitigate against such behaviour.⁽²³⁾ Secondly, government transfer payments schemes may encourage such people not to work; although, on the other hand, they may actually make work possible by enabling the purchase of items necessary to allow the disabled to compete in the labour market. Finally, disabilities may genuinely hinder the acquisition of skills necessary to perform certain work tasks productively. But, of course, the disabled may be willing (or even anxious) to try that much harder to gain skills and the disabled quota may be seen as giving them the requisite opportunity.

The upshot of all this is that it is very difficult to weight a priori the above influences and derive an unambiguous expectation regarding the impact of health on unemployment probabilities. Indeed, there may well be a causality problem here with certain authors (eg Forbes and McGregor (1984)) arguing that unemployment can be a significant influence upon health. Given also the suspect self-assessment methodology used for the GHS questions on the subject, the single control that will here be used is whether the individual has a long-standing (1974)/chronic, i.e. recurring, (1978) illness. As such pregnancy is not regarded as a health condition as it was in the study by Passmore et. al. (1983).

IV.v MARITAL STATUS

In much the same way as age might be felt to be associated with positive work habits, arguments of a similar nature are frequently advanced for the institution of marriage. How far, or in how many individual circumstances, this is truly an independent influence on labour market behaviour is perhaps, however, more debatable than is often assumed. Thus, it may be that those with more stable characteristics are more likely to marry, or to remain so having

entered that state. Furthermore, in a sample such as the present one it may be that marriage to some extent proxies age. Nevertheless, one must pay heed to the potential signalling influence of marriage as well, of course, to the possibility that it does in fact have some independent psychological effect. Even then, however, it must be recognised that the usual argument applies most clearly to males. If a wife is in the labour force at all, it may be that the possession of a husband, who it is assumed is likely to be in stable employment, may allow her to behave more erratically than single contemporaries. For the present this will be left as an empirical matter and the working hypothesis adopted is that marriage should reduce the probability of joblessness.

IV.vi HOUSEHOLD STATUS

A certain amount has already been said about the relationship of the respondent to the head of the household in which he, or she, resides. In particular, in addition to the full sample of observations, a restricted sample comprising only those individuals living in the household of a relative will be analysed. The reasoning behind this is that those living with family may be the more likely to be involved in a joint utility maximisation exercise with others who are potential sources of income. It might therefore be an important conditioning influence on the other household income measure discussed below. In particular, it might be argued that those living with family can better afford unemployment holidays or will be in a position to engage in more selective search activity once unemployed. Additionally, however, heading a household or

living independently may have a similar impact to that assumed of marriage on labour market behaviour. On these grounds one might expect those living with family to be the more likely to be unemployed than others and this will by the hypothesis adopted here.

However, it is desirable to be aware of the difficulties which the above reasoning overlooks. In the first place, the argument is not perhaps so clear-cut when applied to females rather than males. In particular, married females will be included amongst those who are living with relatives. Whilst there has been much theorising about the likely labour market behaviour of married females it does not necessarily yield unambiguous predictions. On top of this, rather more concern is usually expressed in their case regarding the meaning of their declared market status. A further problem, this time common to both sexes, that has been ignored in the above discussion of household status is that the unemployment benefits receivable by those not living with relatives may, at least nominally, exceed those available to youths residing with family. However, much of the difference is supposedly to cover housing costs and without entering into further speculation regarding income sharing within families it is difficult to anticipate the significance of this.

IV.vii FAMILY EFFECTS

Rather abstract concepts such as family background, childhood environment or related phenomena are normally held to condition many of the other influences upon young peoples' potential labour market success. In the usual case this has amounted to controlling for some characteristic or other of an individual's parents. This should not

be seen as an attempt to separate "nature from nurture" (Becker (1964)) but rather as an attempt to control for differences in the "quality" of the latter. For instance, education in the home may make a considerable contribution to total education - particularly perhaps when the education measure employed relates solely to years of schooling. Also, different families are likely to have differing expectations of their offspring, most relevantly here with respect to how strong the pressures are to find employment.⁽²⁴⁾ Furthermore, families may be the source of information and contacts which help ease job search.⁽²⁵⁾

It is clear that whatever summary controls are made they are very unlikely to capture such influences in full, or even necessarily very well. However, some attempt at recognising them is required. Probably the most complete analysis of possible family influences to date has been that by Rees and Gray (1982) and it is a particularly important contribution in that its findings suggest that sibling interactions may actually be stronger than those between parents and their children. But, unfortunately, the former factors cannot properly be taken account of with the present data set and reliance must be placed on more conventional family background indicators.

The first measure that will be used is income. Whilst there are many possible objections that could be raised against this it still receives attention in the literature (e.g. Rees and Gray (1982)). Having decided to proxy background by this variable, however, one must be aware of the possible problems which might remain. In the first place, there is the possible endogeneity of household income when modelling the work decision-making process. In an attempt to overcome

this, albeit partially, this variable is defined as total household income less the income of the subject under study, which might be called "other household income". Having done this, however, one runs up against the problem that a given income will not represent the same thing to households of different structures.⁽²⁶⁾ Here an attempt will be made to allow for this by including the number of persons in the household as an additional control measure. This is on the one hand very crude, in particular taking no account of household equivalence scales (on which see Rowntree (1901) and Brown and Deaton (1972)), but on the other it might be a significant environmental influence in its own right. For this latter reason household size will remain amongst the vector of explanatory variables, even in those cases where income is not used as the background control, and on balance is expected to increase the likelihood of unemployment. Even having done this, however, it is not straightforward to sign a priori the income variable. Thus, on the one hand, higher household income may allow of unemployment holidays, longer search etc. but, on the other hand, it may proxy motivational influences, labour market contacts and so on. No hypothesis is therefore proposed regarding the direction of influence of this particular measure.

However, it is frequently asserted that income may well not be the best indicator of home environment, perhaps particularly where it is measured by current rather than permanent earnings, as is the case here.⁽²⁷⁾ In recognition of this an alternative measure will also be examined. This relates to the socio-economic group (SEG) of the respondent's father. Once again some compression of the detail available in the source data is required to prevent the unwieldy proliferation of dummy variables.⁽²⁸⁾ The simplification adopted

follows Nickell (1979c, 1980) in distinguishing between whether the respondent's father was a manual worker or not. But recognition is also made of a problem with the GHS SEG classification which Nickell seems to ignore in his analysis. This is that those in the armed forces are identified separately, and it is not clear where they fit into the ordering. In the present instance, therefore, non-manual fathers will represent the base group and two dummy variables will be introduced to denote father a manual worker and father in the armed forces.⁽²⁹⁾ In the case of the former, convention will be followed and the hypothesis made that the variable should be positively signed - although this is somewhat at variance with the uncertainties discussed above regarding the family income measure. As for the armed forces control, no prior expectation is advanced.

IV.viii HOUSING

There has recently been some interest shown in whether an individual's housing status exerts any independent effect on the probability of unemployment (e.g. McCormick (1983), Nickell (1980)). However, it is difficult to see why housing tenure per se should exert any such influence. Rather, it is likely to be the case that, if significant differences are found among tenure groups, as in the above studies, this is because tenure affects other variables that have, perhaps of necessity, been excluded from the analysis. There are several ways in which this apparent effect may come about.

Firstly, spatially uneven council house building programmes may lead to excessive labour supply in certain areas. But this requires both wages in the receiving area and accommodation prices in areas

from which families migrate to be sticky. Furthermore, even if this is the case, regional policy must not act to counter the consequent unemployment pockets. Secondly, maintaining the focus on council housing, neighbourhood effects may serve to create differential unemployment therein. This may come about simply through unemployment having less stigma attached to it in such areas or, slightly more subtly, through greater knowledge of the unemployment benefit system (presumably through communal experience) which will thereby reduce the perceived cost of spells out of work. Both the foregoing suggest that one should differentiate simply between those in council housing and others, as Nickell (1980) did. McCormick (1983), however, extends the analysis and suggests that more careful reasoning is required.

In the first place, he argues that, *cet. par.*, the replacement ratios of renters will be greater than those of mortgagees or owners, if unemployment earnings exceed the supplementary benefit threshold.⁽³⁰⁾ This is true for those renting from either public or private sector landlords and occurs because once the supplementary benefit threshold is exceeded buyers are no longer eligible to rate, mortgage interest and maintenance supplements whilst tenants still receive rent supplements. Secondly, he points to the role of wealth in labour supply decisions. Thus, those who own outright will *cet. par.* be wealthier than those mortgaging, whilst renters may enjoy the income from the capitalised value of their housing subsidy when rents are controlled. These effects should increase the duration of unemployment and perhaps increase the propensity to take unemployment "holidays" amongst the groups concerned. These arguments suggest

that the important distinction is likely to be between those buying on mortgage and all other tenure groups, and this was in fact borne out by McCormick's empirical results.⁽³¹⁾

However, the force of these arguments is not at all clear cut when attention is focussed explicitly on young people. Thus Hughes (1979), in his more detailed analysis, considered only heads of household, whilst even Nickell's (1980) more simplified approach looked only at males aged 18 and over. In the face of this uncertainty, the present analysis will only try to capture the central distinctions that have been made in the housing-unemployment literature. Thus, in the full sample, the base group will be all those not living in council housing who are also not heads of household with a mortgage. Separate dummy variables will then be used to identify those living in council housing, expected to positively influence the probability of unemployment, and those who are heads of household with a mortgage, which would be expected to negatively influence the likelihood of unemployment. In the restricted sample, only the council housing distinction will, or indeed can, be made. This differentiation, based on the neighbourhood effects argument outlined earlier, might possibly be relatively more significant for young people not directly affected by the financial implications of the differing accommodation tenures noted above. Nevertheless, it does ignore any indirect family effects from this source.

IV.ix REGION

The two years under study differ in terms of the cycle, even if they do not represent extreme boom and slump. However, even in a given year opportunities within the labour market are recognised to depend upon geographic location. That is, the economic bases of different areas are not all equally cyclically sensitive. With the present data set it is possible to assign individuals to the economic regions for which the Department of Employment publishes unemployment rates and this will be the final influence here considered. To highlight the disparities which exists, Table 1 below gives these

TABLE 1

STANDARD REGION UNEMPLOYMENT RATES : APRIL

REGION	1974	1978
SOUTH EAST	1.7	4.2
EAST ANGLIA	2.3	5.3
SOUTH WEST	2.9	6.8
WEST MIDLANDS	2.4	5.4
EAST MIDLANDS	2.5	5.0
YORKSHIRE & HUMBERSIDE	3.2	5.8
NORTH WEST	3.8	7.3
NORTH	5.1	8.6
WALES	4.3	8.4
SCOTLAND	4.6	8.2
GREAT BRITAIN	2.9	5.9

unemployment rates for the regions to which individuals will be allocated for the generally "average" month of April each year. In both years unemployment in the most prosperous region was less than half that in the most depressed, which were respectively the South East and the North. These unemployment rates will, therefore, be used in an attempt to control for regional disparities in job opportunities. This is clearly not a perfect way of so doing as each region will contain its own pockets of relative prosperity and depression.⁽³²⁾ It is, however, the best available given the limited geographic breakdown afforded by the GHS, and also it provides a single regional measure rather than requiring a string of dummy variables.

This concludes the specification of the model to be analysed in predicting the probability of unemployment amongst young people with declared labour market attachment in the two chosen cross-sectional data samples. However, before proceeding to an assessment of its empirical performance, the next section briefly outlines the statistical methodology that will be adopted for estimation purposes.

IV. STATISTICAL METHODOLOGY

In the regression exercises to be undertaken the dependent variable is a 0-1 measure of whether or not the individual is in employment. Consequently the use of standard OLS techniques is, strictly speaking, inappropriate; although the use of such so-called linear probability models is not uncommon. The specific problem arising is that of heteroskedasticity, which means that OLS leads to unbiased and ^{generally} consistent parameter estimates with ^{inefficient 'F'-tests with} the variance of the errors being dependent on the values of the explanatory variables.

This can easily be seen by following Goldberger's (1964) statement of the problem. Thus if Y is the 0-1 outcome of a discrete event which follows the matrix, functional form

$$Y_t = BX_t + u_t$$

then each u_t can take on values of either $-X_tB$ or $1 - X_tB$ as Y_t is either 0 or 1. The expected error variance is then easily calculated as:

$$E(u_t^2) = X_tB(1 - X_tB)$$

if $E(u_t) = 0$

This is clearly heteroskedastic, and OLS thereby technically invalid.

To overcome this problem a logistic form of the underlying probability distribution will be hypothesised, and estimation undertaken by maximum likelihood techniques. That is, the probabilities that $Y_t = 1$ and 0 are

$$P_t = \frac{1}{1 + e^{-X_t B}} \quad 1 - P_t = \frac{1}{1 + e^{X_t B}}$$

and estimation proceeds by maximising the log of the likelihood function

$$L = \text{Prob}(Y_1 \dots Y_k \dots Y_n) = \prod_{t=1}^k P_t \prod_{t=k+1}^n (1 - P_t)$$

This procedure then provides coefficient estimates which represent the change in the log of the odds of the occurrence of Y_t ($P_t/1 - P_t$)

associated with a unit change in the exogenous variable under consideration. Having discussed the various influences likely to effect the probability that an individual young person is unemployed at any particular time (that is, the elements of the regressor vector X) this will be the statistical technique adopted for estimation in the following section.

V. EMPIRICAL ANALYSIS

V.i MODEL SPECIFICATION

Whilst most of the variables being considered in the present study could be the subject of argument regarding their appropriate empirical specification, it was indicated earlier that three - race, education and family background - are here the subject of experimentation in this respect. A perusal of Table 2 below, which defines the variables to be used in the analysis - with the alternative specifications, where appropriate, labelled (a), (b) ... in column 2 - and their expected sign given the prior hypothesising above, will reveal that this gives a total of 24 equations to be estimated for each group in each of the two years of study. With the sample split by sex and then examined as a whole and also only for those living with relatives this yields a global total of 192 regressions. Clearly, this is too many to report in detail and a good deal of selectivity had to be imposed. For estimation purposes the blocks of 24 equations were split by the family background variable. This artificial separation is retained for the purpose of reporting and one equation is presented from each of the eight sets using the income measure of family background and one from each of the eight using SEG indicators. Little is lost by the imposition of this restriction as little difference emerged between the twelve models within each set.

TABLE 2
VARIABLES USED IN ANALYSIS

VARIABLE	MNEMONIC (Expectation)	DEFINITION
DEPENDENT		
Employment Status	EMP	0 = Employed 1 = Unemployed seeking work, waiting to start work
INDEPENDENT		
Relationship to Head of Household	RELN (+)	0 = Head of Household or with non-relatives 1 = Not Head of Household living with relatives
MARITAL STATUS	MARRY (+)	0 = Married 1 = Not Married
RACE	(a) BLACK (+)	0 = White 1 = Coloured N.B. Interviewer uncertain - interviews eliminated
	(b) BIRTH (+)	0 = Born in U.K. 1 = Born outside U.K. (inc. Eire)
	(c) PANAT (+)	0 = Father born in U.K. 1 = Father born outside U.K. (inc. Eire)
FAMILY BACKGROUND	(a) OTHINC (?)	Continuous = Total income of Household Net of Total Income of Individual

VARIABLE	MNEMONIC (Expectation)	DEFINITION
	(b) MANUAL (+)	0 = Father Professional, Employer or Manager, Intermediate or Junior Non-Manual or in Armed Forces
		1 = Father Skilled Manual, Semi-Skilled or Part- Served Manual, Unskilled Manual
	ARMY (?)	0 = Father not in Armed Forces
		1 = Father in Armed Forces
HOUSEHOLD SIZE	NPERHH (+)	Continuous = Number of Persons in Interviewees Household
EDUCATION	(a) ED (+)	0 = Highest Educational Qualification, a Higher Degree, 1st Degree/ University Diploma, Non- Graduate Teaching Qualification, HNC, HND, Full City & Guilds, Nursing Qualification, 'A' Levles, 1 or more 'O' Level.
		1 = Commercial & Clerical Qualifications, CSE (Grades 2-5), Apprentice- ship, Foreign Qualifications, no Qualifications
	(b) ED1 (+)	0 = As Ed Except for 'O' Levels 1 = As Ed Plus 'O' Levels

VARIABLES	MNEMONIC (Expectation)	DEFINITION
	(c) ED2 (+)	0 = Any Qualifications 1 = No Qualifications
	(d) SCHOOL (-)	Continuous = Years of School = Age left School Minus 5
HOUSING	COUNCIL (+)	0 = Not in Local Authority Housing 1 = In Local Authority Housing
	MORTGAGE (-)	0 = Not Heads of Household with Mortgage 1 = Head of Household with Mortgage
HEALTH	HEALTH (?)	0 = Has Long Standing Illness 1 = Does Not Have Long Standing Illness
REGION	REGION (+)	Continuous = Regional Unemployment Rate
AGE	AGE (-)	Continuous = Age

However, it should be noted that the 1978 equations containing the SEG variables utilise considerably fewer observations than their 1974 counterparts. This is due to 91.2 per cent of cases in the full data set having missing values for father's social class, compared to 32.0 per cent in 1974 (Gilbert et al. (1980, 1984)). What is then interesting in this context about the results obtained below is not so much that those for 1978 differ from those for 1974, which is true also when the income measure of family background is used, but that the results for the later year are comparatively insensitive to the sample restriction that this missing data imposes.

The problem remains then of which model to report. Clearly, various criteria could have been adopted, but as one of the stated interests of the work is to examine the impact of the cycle on the results obtained this was taken as the next reporting convention. Thus the results from estimating the same model in 1974 and 1978 are presented. As the 1978 results appear somewhat stronger than those obtained for the earlier year, the best of the former from each equation set was taken as the choice criterion for both analyses. Hence the results from 16 equations are reported in eight pairs, with the same specification used within pairs.

As stated above the estimation technique applied was maximum likelihood logistic regression. However, the results obtained from the simple application of this procedure to the full models were not satisfactory. A fairly common way to proceed in this situation is to begin eliminating variables; but good practice dictates that each potential combination of regressors be examined, with the "best" being chosen by the application of F-tests. Clearly, with many potential variable combinations, as here, this is a particularly cumbersome, not to say error-prone, exercise. Therefore, in order to overcome this

problem, an iterative procedure was utilised which facilitates the selection of the particular model yielding the best fit (using log-likelihood ratio tests).⁽³³⁾ In short, the procedure selects the most well specified set of personal characteristics in the statistical determination of youth unemployment probabilities. This therefore means that, whilst the same model specifications are being reported across years in each table, the same variables will not necessarily appear in each. For completeness, however, the results of estimating the full models corresponding to the equations reported in the text are given in Appendix Tables A1-A8.

Along with coefficient values and their t-statistics, the tables presenting the selected results in the following sub-section also provide various other pieces of information. The first of these is the number of observations within each sample (n). Secondly, the percentage rate of unemployment within that particular sample (% U) is reported. Thirdly, the log-likelihood value for the equation (L.L.) is given. Finally, the foot of each table provides the variables from the full model which failed to survive statistical screening in either year. As already stated the results of logit estimation including all variables are presented in the Appendix and these are in the order in which they appear in the text so that Table 3 presents the truncated versions of the models in Table A1 etc.⁽³⁴⁾

V.ii ESTIMATION

Within this sub-section the detailed results of the analysis are presented. The work is divided under two major headings, those results obtained when other income was used as the family background indicator and those obtained when the SEG indicators were used. These headings are then further sub-divided into the results obtained for

the full and the restricted (living with relatives) samples for male and female youths respectively.

V.1ia FAMILY BACKGROUND - OTHER INCOME

V.1ia (1) Male Youths : Full Sample

The statistical results obtained for the full sample of male youths aged 16-24 in the labour market when other income constitutes the family background variable are presented in Table 3. Looking firstly at what is common across years one immediately finds reasonably strong, albeit unsurprising, support for the notion that youths in more depressed regions run the higher risk of being unemployed; irrespective of the state of the national economy. Secondly, evidence emerges in support of the hypothesis that possession of a mortgage reduces the probability of unemployment. Unfortunately, however, both demand and supply side arguments point in the same direction for this influence and so one is unable to discern which, if any, side of the market is dominating. Thirdly, lack of educational qualifications below 'O' level "standard" appears to retard employment prospects, although its impact is much stronger in the later, more depressed year.⁽³⁵⁾ Fourthly, the data reject the supposition that young people living at home will be the more unemployment prone. Indeed, precisely the reverse appears to be true and may be reflecting counter-arguments revolving around motivation, support and labour force contacts. Finally, as male youths age it appears the more likely that they will be in work, with this influence hardening in 1978.

Turning to the differences between years which the analysis reveals, one can see that these involve three variables. Firstly, the income measure of family background appeared to exert a significant

TABLE 3
 MALE YOUTHS : FULL SAMPLE USING OTHINC

VARIABLE	1974	1978
OTHINC	0.0018 (2.96)	
REGION	0.2263 (2.13)	0.2163 (3.55)
AGE	-0.1026 (1.87)	-0.1098 (2.68)
COUNCIL		0.2625 (2.59)
MORTGAGE	-0.7124 (1.89)	-0.6225 (2.47)
ED	0.2540 (1.89)	0.3418 (3.41)
RELN	-0.4590 (2.50)	-0.3789 (2.86)
BLACK		0.5172 (2.71)
CONSTANT	-2.6968 (2.07)	-1.4862 (1.50)
n	1596	1597
% U	4.2	8.1
L.L.	-264.30	-416.43

T-STATISTICS IN PARENTHESES

EXCLUDED VARIABLES

NPERHH, HEALTH, MARRY

and positive influence on unemployment probabilities in 1974, but did not feature at all in the 1978 results. Secondly, for 1978 the results indicate that youths dwelling in council property (and therefore usually on "estates") were significantly more likely to be unemployed than the base group of non-mortgage possessing youths living in private sector property. Clearly, it would be interesting to acquire further evidence on what is going on here, for whilst earlier arguments were supply-side orientated one can equally use the result as evidence of differential disadvantage. Lastly, and in the same vein as the previous argument, quite strong evidence emerges that non-whites suffered disproportionately as the recession deepened.

V.11a (2) Male Youths : Restricted Sample

Table 4 below summarises the results obtained when the sample analysed was restricted solely to those living with relatives.⁽³⁶⁾ Immediately one gets the impression that the model works less well with this restriction imposed, in so far as fewer regressors are retained, than was the case without it. However, it should at the same time be recalled that the mortgage and relation to head of household (RELN) variables are no longer relevant in this instance. Nevertheless, it should further be noted that there are greater differences across the years than were found above. Indeed, now only two influences were common to the equations at both dates. Thus quite strong evidence once again emerges that area of residence influences the labour market prospects of young males at all stages of the cycle, with somewhat weaker support being afforded to the argument regarding age. All other variables, of those succeeding at all, appeared in one year or the other, but not both.

TABLE 4
 MALE YOUTHS : RESTRICTED SAMPLE USING OTHINC

VARIABLE	1974	1978
OTHNIC	0.00017 (2.65)	
REGION	0.2517 (1.95)	0.2951 (3.98)
AGE	-0.1080 (1.64)	-0.0853 (1.79)
COUNCIL		0.2729 (2.34)
ED1		0.5548 (2.48)
BLACK		0.4938 (1.90)
HEALTH		-1.820 (1.47)
MARRY		3.8339 (3.47)
NPERHH	0.1454 (1.61)	
CONSTANT	-3.045 (2.03)	-6.5037 (*)
n	1033	1091
% U	4.5	8.2
L.L.	-179.22	-286.78

T-STATISTICS IN PARENTHESES

* Did not pass Tolerance Test

Once again, other household income appears positively in the equation for the earlier year but not for 1978. In addition to this influence, the number of persons residing in the young males household possibly affected unemployment probabilities in the early year but not the latter. Whilst having due regard for the size of its attendant standard error, one can also note that the positive coefficient on the variable is in accord with prior expectations.

Five variables survived the stepping in the 1978 model which did not in the earlier year. Firstly, the council housing variable once again emerged as per hypothesis, and significant. The same, secondly, was true of the colour variable; strengthening the earlier differential impact reasoning regarding the depression. Thirdly, the education variable, this time differentiating between those with 'A' levels or higher from those without, emerged as significant - at 10% at least - again perhaps suggesting the less formally educated suffer first as the economy turns down. The health measure also survived in the later year, with a negative coefficient, although it was far from significant. Finally, marriage appears to have emerged as an important negative influence on the probability of being unemployed; however, the small number with this status in the restricted sample reduces confidence in the finding.

V.iiia (3) Female Youths : Full Sample

A consistent feature of the results obtained for female youths

is that a smaller proportion of the proposed models have relevance for them than appears to be the case for young males; as Table 5 demonstrates in the case of the full sample using other income as the family background indicator. However, even with fewer variables appearing in the statistically acceptable models, structural instability across the observation years is still evident. With the exclusion criteria used, this means that more regressors were acceptable only in one year than were acceptable in both. However, it is perhaps of particular interest to note that all but one of these latter influences emerged in the later, more depressed data period; thereby again being suggestive of non-neutral cyclical impacts upon unemployment probabilities.

Examining first those hypothesised determinants that were significant in both 1974 and 1978, it is probably no surprise to see that the regional unemployment measure is amongst their number. What might be of interest nevertheless in this context is that the magnitude of its impact declined, even though its statistical significance increased. It would clearly be premature to surmise that any equalising of (dis)opportunity had taken place, but the finding may present a pointer for future research interest. Secondly, age emerges as a significant, negative influence on female youth unemployment propensities in both years, a result again in accord with that obtained in the full young male sample discussed above, thereby increasing general confidence in the finding. Only the relation to head of household measure was solely significant in 1974, although it was signed contrary to generalised prior hypothesising. This is clearly a difficult area, however one might take the results

TABLE 5
 FEMALE YOUTHS : FULL SAMPLE USING OTHNIC

VARIABLE	1974	1978
OTHINC		-0.00007 (2.20)
REGION	0.2565 (2.19)	0.1486 (2.60)
AGE	-0.1218 (2.31)	-0.1346 (3.91)
COUNCIL		0.1753 (1.91)
SCHOOL		-0.3507 (3.04)
RELN	-0.4900 (2.25)	
CONSTANT	-1.0071 (0.86)	3.8838 (2.45)
n	1190	1338
% U	4.6	11.1
L.L.	-216.10	-441.79

T-STATISTICS IN PARENTHESES

EXCLUDED VARIABLES

MORTGAGE, HEALTH, PANAT, NPERHH, MARRY

as some indication that further work is necessary on the work patterns of young married females who will be classified as living with relatives on this score. In particular, one may look to both encouraged worker effects and contributions to the hypothesised secondary, part-time workforce from this group.

Three influences emerged in the 1978 survey as, more or less, significant determinants of young females' unemployment that did not show up in the 1974 results. The first of these, education - measured here by schooling, rather than educational attainment - was an important negative influence in the later year. Secondly, albeit not strongly, council house dwelling appears to become a potentially important determinant of joblessness in depressed times. However, there is a clear need to attempt to clarify just what influences are at work.⁽³⁷⁾ Finally, family income in 1978 apparently positively impacted upon employment prospects. This result runs counter to the finding for males. The reason for the contrast, as opposed to any particular sign pattern, may lie in a relationship between income and the propensity of young unemployed females to declare any market attachment at all. This is, however, speculative.

V.11a (4) Female Youths : Restricted Sample

The results obtained for the restricted girls sample, given in Table 6, are the most parsimonious to date and point to a relatively few key influences being responsible for differential unemployment propensities amongst young females. In particular, region and age are significant in both years and signed as per expectation. Indeed, in the relatively healthy economic environment of 1974 these two variables emerged as the only significant regressors.

TABLE 6

FEMALE YOUTHS : RESTRICTED SAMPLE USING OTHINC

VARIABLES	1974	1978
OTHINC		-0.000090 (2.52)
REGION	0.3209 (2.54)	0.1303 (2.20)
AGE	-0.1192 (2.16)	-0.1416 (3.97)
COUNCIL		0.1836 (1.93)
SCHOOL		-0.2467 (2.02)
CONSTANT	-1.7006 (1.44)	3.1059 (1.89)
n	1082	1195
% U	4.5	11.6
L.L.	-193.58	-407.93

T-STATISTICS IN PARENTHESES

EXCLUDED VARIABLES

NPERHH, HEALTH, MARRY, BLACK

By 1978, however, three additional characteristics emerged as significant determinants of young females labour market fortunes, two of which add weight to the earlier findings for youths of both sexes. Thus, as the recession deepened, both council house dwelling and educational attainment (as proxied by years of schooling) became important influences upon labour market success. A fairly clear pattern is, therefore, emerging that simple knowledge of how high the level of youth unemployment is/will be, will leave one with a very incomplete picture of how the total will actually be distributed amongst young people. This is perhaps unsurprising, but it should serve as a salutary reminder that successful aggregate time-series modelling is hardly an adequate economist's response to the problems existing in the youth labour market. However, in closing the discussion on the results incorporating household income, one should note how, once again, this variable was negatively signed for young females and in contrast to the result for males.

V.iib FAMILY BACKGROUND - SEG INDICATORS

Whilst the contrasts which emerge by changing the measure of family background from income to socio-economic group indicators are not particularly great they merit reporting, if only to stress earlier findings. Further, however, the reasonable similarity between the results should go some way towards allaying fears regarding the self-reporting of income, which is a feature of the GHS that many might view with considerable suspicion.

V.iib (1) Male Youths : Full Sample

Whilst the general pattern of the results for the full boys sample using father's SEG are not too dissimilar from those above, Table 7 does indicate that there is rather more instability in the model across years. In this instance, there are now only two influences which figure in common; these being the manual worker and marriage variables. Both have the expected positive directional influence and the former achieves satisfactory significance levels in both years. That the latter variable hardens considerably in the later year is of some interest, although this still does not really provide any insight as to whether this came about through supply or demand side pressures. However, the large value of the coefficient in the later year is somewhat suspicious and probably reflects the small number of marrieds (16) in the particular sample used. (38)

Of the variables appearing only in 1974, it will be recalled that having a father in the armed forces attracted no definite prior expectation. Empirically, in this instance, it turned out to have a significant positive impact on unemployment probability, which may possibly be a reflection of the disruption to education associated with mobility in early life that parental military service may impose upon their offspring. Secondly, mortgagees, as per expectation, were less prone to unemployment than the base group. However, living with relatives once again proved to be a surprisingly negative influence. Finally, living in large households was positive, as expected, and may go some way towards rationalising the cet. par. finding on relationship to head of household.

TABLE 7

MALE YOUTHS : FULL SAMPLE USING SEG INDICATORS

VARIABLE	1974	1978
MANUAL	0.4683 (2.39)	0.3349 (2.12)
ARMY	1.0226 (2.42)	
REGION		0.4054 (4.70)
AGE		-0.1543 (2.87)
MORTGAGE	-0.6904 (1.80)	
ED2		0.4408 (3.38)
RELN	-0.5236 (2.42)	
BLACK		0.6534 (2.40)
NPERHH	0.1573 (1.91)	
MARRY	0.3308 (1.48)	4.0091 (3.40)
CONSTANT	-3.7192 (6.27)	-5.6484 (*)
n	1546	945
% U	3.8	7.4
L.L.	-239.65	-220.28

T-STATISTICS IN PARENTHESES

* Did Not Pass Tolerance Test

EXCLUDED VARIABLES

COUNCIL, HEALTH

Turning to those factors which newly emerged as significant in 1978 one can see that most were those which have, at least in this later year, consistently been important. Thus, region of residence, age and educational attainment all appear as per expectation and are very well determined. Furthermore, colour once again emerges as an important unemployment determinant for young males. One is thereby tempted to conclude that the present analysis is painting a fairly consistent picture of how the initial upsurge, at least, of youth unemployment was distributed. However, the peculiar characteristics of the full 1978 youth sample utilising SEG indicators of father's status, with few marrieds and consequently few mortgagees, should be borne in mind.⁽³⁹⁾ Therefore, confirmation should in this instance be sought from the restricted sample in which the mortgage variable is not included and marriage was quickly excluded by the stepping process.

V.iib (2) Male Youths : Restricted Sample

Table 8 below, presenting the results obtained from the 1978 restricted sample using only those young males living with relatives, does present quite reassuring confirmation of the findings from the full data set. Thus, whilst manual is somewhat weaker than previously, the pattern of results for the SEG family background indicators is as before. Furthermore, region, education and race again show up very significantly and correctly signed in the later year, whilst not appearing in 1974. In addition, number of persons in the respondent's household again shows significance in the former, but not the latter, year of observation.

TABLE 8

MALE YOUTHS : RESTRICTED SAMPLE USING SEG INDICATORS

VARIABLES	1974	1978
MANUAL	0.3827 (1.56)	0.2677 (1.79)
ARMY	1.2388 (2.72)	
REGION		0.4373 (5.12)
AGE	-0.1000 (1.44)	-0.1453 (2.64)
ED1		0.5300 (2.15)
PANAT		0.5302 (2.91)
NPERHH	0.2165 (2.42)	
HEALTH		-0.2568 (1.81)
CONSTANT	-1.4071 (0.95)	-2.7993 (2.27)
n	1041	993
% U	3.7	7.5
L.L.	-158.22	-234.37

T-STATISTICS IN PARENTHESES

EXCLUDED VARIABLES

COUNCIL, MARRY,

This means that the comparatively minor, qualitative differences in the results obtained for the two samples are as follows. Firstly, the age variable appears in both years in the restricted sample and only in 1978 when the full data set is used. However, in 1974 it falls well short of significance in the former case. Secondly, the health measure, which was argued to be a priori ambiguously signed, enters significantly, for the only time in all the results presented, in the 1978 restricted sample analysis.⁽⁴⁰⁾ Taken at face value, although noting that the coefficient is only significant at the 10% level, the result obtained suggests that disability amongst those who claim labour market attachment is not in fact a disadvantage in the quest for employment. Indeed, rather the opposite is suggested. Thirdly, the mortgage variable was weakly significant in 1974 in the full sample but does not appear at all in the restricted one. Finally, when all observations were used the marriage variable was retained in both years and was strongly significant in 1978. However, when only those living with relatives are considered the variable is never retained; which is not surprising given the small number with this status in the restricted sample.

V.iib (3) Female Youths : Full Sample

Once again the results obtained for the full sample of young females presented in Table 9, suggest that a rather smaller vector of influences can be used to predict differential labour market success than is the case for their male counterparts. In the present instance, only one variable is common across years; that being region of residence. Broad socio-economic group of father only appeared as a significant regressor in 1974, when the daughters of manual workers were apparently considerably more likely to be unemployed than were

TABLE 9

FEMALE YOUTHS : FULL SAMPLE USING SEG INDICATORS

VARIABLE	1974	1978
MANUAL	0.5738 (3.41)	
REGION	0.2478 (1.88)	0.1798 (2.17)
AGE		-0.1149 (1.69)
COUNCIL		0.2953 (2.22)
RELN	-0.5246 (2.41)	
CONSTANT	-3.7533 (7.72)	1.2204 (1.01)
n	1237	710
% U	3.6	9.7
L.L.	-179.34	-218.25

T-STATISTICS IN PARENTHESES

EXCLUDED VARIABLES

ARMY, NPERHH, MORTGAGE, HEALTH, ED1, BLACK, MARRY

those with white-collared fathers. Also in that year, but not in more depressed 1978, living with relatives was a significant negative influence on the likelihood of joblessness. This last result concurs with previous findings and the evidence in total provides a fairly convincing rebuttal of the prior theorising on this control put forward in Section IV above.

Only two variables appeared in the 1978 results alone and both of these go towards confirming earlier results. Thus, as young females age it appears that they become less prone to unemployment. However, rather more than in the case of young males, one should approach this finding with some caution. Thus there is here the possibility that, as the labour market slackens, older females pursue "rewarding" non-market activities and do not declare unemployment. Hence a cyclical labour supply effect may be more likely to emerge as females age, due either to marriage (which itself was eliminated from this analysis) or to the possession of more elderly/disabled parents.⁽⁴¹⁾

V.iib (4) Female Youths : Restricted Sample

The final results reported are those for young females living with relatives and these are given in Table 10 below. In general they bear a strong resemblance to those obtained for the full sample above and so will not be discussed in great detail. Thus family background, region, age and council house dwelling all perform as previously. Furthermore, relationship to head of household is now a sample selection criterion rather than an independent regressor and therefore its non-appearance in the current instance need be discussed no further. This, therefore, leaves two variables which appear in the present 1974 analysis but nowhere else in the female

TABLE 10

FEMALE YOUTHS : RESTRICTED SAMPLE USING SEG INDICATORS

VARIABLE	1974	1978
MANUAL	0.6419 (3.41)	
REGION	0.2107 (1.46)	0.1777 (2.13)
AGE		-0.1208 (2.03)
COUNCIL		0.3048 (2.27)
BLACK	-3.5767 (0.28)	
NPERHH	0.1576 (1.78)	
CONSTANT	-8.3769 (0.65)	-1.1044 (0.91)
n	1152	698
% U	3.2	9.7
L.L.	-152.52	-214.75

T-STATISTICS IN PARENTHESES

EXCLUDED VARIABLES

ARMY, HEALTH, ED1, MARRY

analyses using SEG as the family background indicator. The first of these is colour, which surprisingly is negatively signed. However, the coefficient is so poorly determined that no confidence can be placed in the finding. Secondly, number of persons in the household appears as a positive influence in the results for the earlier year, as expected, although it is only weakly significant.

VI. CONCLUSION

This chapter has had the principal aim of examiningⁱⁿ how any particular level of aggregate youth unemployment is distributed amongst their number, by reference to various potentially salient economic characteristics. This objective was pursued via the medium of the official General Household Survey which to date, although having been used for the analysis of adult unemployment patterns, does not appear to have been utilised in the specific context of young people. In conducting the analysis, the data was first split by sex, a division seemingly vindicated by the differences in the results obtained. Then each of these samples was examined in full and also including only those young people who were living with relatives.

One consistent finding to emerge was that rather fewer characteristics appear to differentiate those young females in and out of work than is the case for young males. This said, region of residence and age turned out to be consistent predictors for young people of either sex. The former appears straightforward whilst the latter suggests that, in the 1970's at least, the youth unemployment problem may really have been ^{more heavily} concentrated amongst the very youngest in the market. It is further of interest, however, to note that the size of the age impact grew between 1974 and 1978 whilst its

statistical performance consistently improved. The vital question then seems to become whether one would expect this to continue in later years when an increased percentage of older youths will have experienced past unemployment spells? If the answer is affirmative, and government intervention in the market renders this an extremely tricky issue, then one might be tempted to infer that age reflects something more than a simple skill proxy. However a satisfactory resolution of this issue requires analysis additional to that which is possible here.

The comparative aspect of the work involved examining the results obtained at two different stages of the cycle and this provided not only evidence of non-neutral cyclical effects on labour market prospects, it also generated sufficient disparities across years to throw doubt on the practice of simply looking at one cross-sectional sample in isolation. In the case of young males it appears that the brunt of the onset of recession was borne by non-whites, the least formally educated and council house dwellers.⁽⁴²⁾ Only in the case of the second mentioned does it seem that established reasoning is satisfactory. Thus, to the extent that formal education level is positively correlated with market valued skills, then the usual demand side arguments for the above finding carry with them a widely held conviction. With the two remaining variables there remains the possibility that demand side discrimination/screening factors or supply side motivational forces are dominating in the generation of the results. Unscrambling exactly what is going on may have an important influence on the way the uneven distribution of the unemployment burden is viewed. To learn that responsibility for its distribution lies, at least partially, in differences in knowledge

regarding the unemployment benefit system probably should evoke somewhat different sentiments from a realisation that it is the result of employers' taking "advantage" of wage rigidities and output constraints to exercise their taste for discrimination.

For females the results were perhaps somewhat less clear-cut, although fairly strong consistent evidence emerged that council house dwellers suffered particularly badly as the economy turned down. In addition to this, when the SEG indicators were used as the measure of family background, age turned out only to be significant in 1978, whereas in the alternative income formulation it seemed to be important in both years. This latter specification in fact threw up an interesting contrast between the sexes. Thus, although the income measure itself only appeared for males in 1974 and for females in 1978, in all cases it was significant. However, it was of opposite sign across the sexes; being positive for males and negative for females. No firm prior expectation was assigned to this variable but, taking the results at face value, the former finding seems to support the arguments proposed regarding income effects on unemployment whilst the latter might signify motivational pressures, labour market contacts or, perhaps, a tendency for females from wealthier backgrounds to eschew labour market attachment totally rather than declare unemployment. These issues seem worthy of further inquiry.

A further interesting contrast emerged when socio-economic group indicators were used as the family background control. Then, having a father who is a manual worker affected the unemployment probabilities of both sexes in the same (positive) direction, although for females this was only true in 1974. It is

difficult, however, without further information on the relationship between SEG and income to make inferences about what exactly is the cause of the observed differences. Lastly, one may note that, with income as the family control, education - in the guise of years of schooling - became a significant determinant of female unemployment probabilities in 1978. This result, therefore, strengthens that obtained earlier for males.

The evidence generated regarding the other influences considered is somewhat more patchy. Perhaps the strongest was the relationship to head of household measure which, when it appeared in the full sample results, suggested that those living with relatives are, contrary to initial hypothesising, the less likely to be unemployed than either those heading their own household or living with non-family. However, the influence faded somewhat across the years. Likewise, one might draw some support from the 1974 findings for the presupposition that the number of people in a youth's household will be detrimental to his or her labour market fortunes. Once again, however, the variable faded in 1978. Also, although only in the case of young males, holding a mortgage seems perhaps to improve labour market performance.⁽⁴³⁾ Finally, on the evidence from the current data and results at least, it would appear desirable to discount health and marriage as influences on the likelihood of unemployment. The former is not too surprising, given the arguments advanced earlier, whilst traditional reasoning regarding the latter may be somewhat displaced when, for instance, the incidence of (supposedly destabilising) divorce is so prevalent.

Whilst it is clear that much remains to be done - not least of which being assessing how relevant the findings are to the current situation - the message does seem to emerge that successful and efficient help for youth in the labour market may need to be more strictly targeted than is usually the case. Certain of the ways in which this might be done are highlighted above. However, such a recommendation is made without reference to the political obstacles that may lie in the path of its achievement. For instance, Britain has been persistently faced with regional disparities in unemployment in general and so why should those of youths receive particular attention in the present epoch? Also, whilst one can imagine pervasive positive discrimination by educational attainment, as might be argued YTS aims to achieve, it is perhaps somewhat harder to imagine positive discrimination by colour. However, providing the results of the present exercise stand up to scrutiny and find support in other work, the work reported here does provide a backdrop for the possible emergence of imaginative policies to improve the efficiency of the labour market itself or, perhaps, the morale of certain participants within it.

- (1) Just two of the studies on the distribution of British unemployment are Daniel (1974) and Nickell (1980).
- (2) The one exception to this in Britain might be a time series regional unemployment exercise. However, at all but a still highly aggregated standard region level, even this is bedevilled by enactments such as local government reorganisation (1974) and the paucity of data on factors such as population characteristics which would form an integral element of such work at all but a very descriptive level.
- (3) As the following discussion will indicate more has been done on the characteristics of unemployed British adults and on those of all groups in the U.S.A.

(4) It would perhaps be more acceptable to argue that sufficient may be known to determine the overall level of unemployment. For current purposes this then leaves two less clear cut problems. (1) How this is distributed in the labour force by age, which was part of the subject matter of the previous two chapters. (2) How the resulting youth unemployment is distributed amongst individuals, which forms the present focus of interest.

(5) Even more difficult to assess are the incentive effects associated with the taxation necessary to finance subsidisation.

(6) On the understanding that sampling problems may affect both years results.

(8) It is furthermore not clear whether individuals on such schemes would class themselves as in or out of employment, which will introduce further ambiguity if no specific question is asked about the issue.

(9) The GHS is an ongoing inquiry with an end date of April in the year to which it is allocated.

(10) The GHS Surrey sub-sets for the chosen date sets (1974 and 1978) are due to Gilbert et. al. (1980 and 1984 respectively).

(11) The upper age limit used in this case corresponds to that employed by the Statistical Office of the European Communities in its definition of youth. The lower limit used by that body is 14 years, which would generate only redundant extra observations in the present case as the focus is on those youngsters in the labour market.

(7) The Surrey sub-set is a "flat, rectangular" version of the original data allowing easier usage with conventional statistical computer packages.

- (12) Unemployment rates for the samples used are presented below.
- (13) In fact pooling the sexes really demands, at least exploration with, numerous interaction terms; a cumbersome practice which can be avoided by separate analyses.
- (14) It is, of course, possible that young people living at home may be supporting their parents. With the aid of the observations on all individuals sampled (i.e. the full data set) one might attempt, on the basis of parental employment status and (disclosed) total family income, to infer which youths were in this situation. But this would be little more than guesswork and, furthermore, as noted above, would greatly increase the computational requirements.
- (15) The GHS separately identifies 8 categories which have been pooled for this purpose.
- (16) Both Nickell and Ashenfelter and Ham (1979) found that education only weakly affected unemployment duration.
- (17) A comprehensive, recent review of the labour supply literature is provided in Killingsworth (1983).
- (18) Analyses of the effects of schooling must, of course, recognise the potential confusion of family, environment and innate ability influences with those of education itself. Certain of the other sub-sections in this chapter attempt to provide controls for this.
- (19) In the usual case, individuals need to be uncertain about their own ability before engaging in costly signalling, otherwise they would offer employers money-back guarantees regarding their performance at work.
- (20) More detailed reviews of factors that have been cited to justify controlling for race can be found in Morse (1981) and Cogan (1982).
- (21) Note that Beckerian discrimination is not equivalent to discrimination based on misperceptions of certain groups efficiency. This is a form of signalling problem which can be eliminated by the spread of knowledge. "Pure" discrimination is independent of knowledge. Controls like those attempted here cannot, however, pinpoint which of these forces is work.
- (22) It is to be noted that many American studies (e.g. Feldstein and Ellwood (1982)) conduct their analyses for blacks and whites separately. This might be an interesting avenue for further research in a British context also.

- (23) This is not strictly binding, however, although this is in part due to there being too few registered disabled to allow of overall compliance. For further details see for instance, DEG February, 1985, p.73.
- (24) Strong pressure to find work may exist not because of any work ethic per se but for a variety of other familial circumstances more properly associated with income positions.
- (25) A simplified theory of job search was first provided by Stigler (1962) whilst the kind of embellishments discussed here made their first real impact through the work of Rees (1966).
- (26) There are not just problems of gross income per head but also of differing tax liabilities for different family structures.
- (27) On differing income concepts see Friedman (1957).
- (28) Construction of a continuous hierarchy measure of SEG would be open to serious objection.
- (29) Differentiating individuals by head of households' educational qualifications was also considered. Amongst other things this would have recognised that natural fathers' background may be of less relevance than some other individuals. However, it was not possible to make the data conform across the two years and furthermore the strength of formal educational attainment arguments is probably weaker with older workers and, therefore, this line of inquiry was not pursued.
- (30) He gives no indication as to the number of people to whom this applies.
- (31) For a more detailed treatment of housing subsidies see Hughes (1979).
- (32) One might conceivably assert that individuals are more likely to be mobile within than across regions, but this does not seem a very strong argument when regions are administratively rather than politically or geographically delimited.
- (33) The precise package used was the Backward Stepwise Logistic Regression routine of BMDP.

- (34) Occasionally no standard error was computed for a variable or the constant term due to the collinearity between them exceeding that satisfying the parameter requirements of the BMDP package for the computation of a reliable estimate. This is signified by the variable having failed to pass the tolerance test.
- (35) This may, of course, reflect the (perhaps hastened) demise of traditional work for which apprenticeships were necessary, for instance. As such there is a structural problem, responsibility for which some may lay at the door of the educational system for lack of foresight.
- (36) Note that this includes those living with spouse.
- (37) In particular, does the observation really reflect a supply phenomenon or is dwelling status a screening device used by employers?
- (38) The coefficient size is not a result of the step-wise procedure as Table A5 shows. Further, the decision of how much variance in independent variables is sufficient for the purposes of regression analysis is one of the functions that the procedure can "objectively" perform.
- (39) This is not a problem either in 1978 when other income is the background indicator used, or whichever specification is employed in 1974.
- (40) Health very rarely entered in any of the suppressed results either.
- (41) The former possibility should not perhaps be over-emphasised in the case of females less than 24, although there may be some substance in the disability aspect of the argument.
- (42) In the analyses using the SEG indicators the lack of significance of the council house variable may be attributable to its correlation with having a blue-collar father.
- (43) If it is principally males who are the mortgagees in families it is not surprising that this influence did not show through for females. It would then be interesting to ascertain what effect having a mortgage in the nuclear family had on the labour market behaviour of wives.

TABLE A1
 MALE YOUTHS : FULL SAMPLE USING OTHINC

VARIABLE	1974	1978
OTHINC	0.00017 (2.64)	0.00000012 (0.04)
REGION	0.2251 (2.10)	0.2153 (3.52)
AGE	-0.0886 (1.57)	-0.1028 (2.49)
COUNCIL	-0.0008 (0.01)	0.2517 (2.42)
MORTGAGE	-0.6550 (1.69)	-0.5953 (2.33)
ED	0.2570 (1.81)	0.3303 (3.23)
RELN	-0.6025 (2.64)	-0.5808 (2.80)
BLACK	-0.0805 (0.21)	0.4889 (2.54)
NPERHH	0.0528 (0.60)	0.0888 (1.38)
HEALTH	0.0677 (0.36)	-0.0528 (0.53)
MARRY	0.2069 (0.89)	-0.1688 (0.86)
CONSTANT	-3.1848 (2.10)	-2.0015 (1.92)
n	1596	1597
% U	4.2	8.1
L.L.	-236.69	-415.13

T-STATISTICS IN PARENTHESES

TABLE A2

MALE YOUTHS : RESTRICTED SAMPLE USING OTHINC

VARIABLE	1974	1978
OTHINC	0.00018 (2.69)	-0.0000006 (0.20)
REGION	0.2436 (1.87)	0.2913 (3.90)
AGE	-0.1175 (1.65)	-0.0810 (1.70)
COUNCIL	0.0698 (0.43)	0.2493 (2.10)
ED1	-0.0153 (0.06)	0.5334 (2.38)
BLACK	-0.1624 (0.30)	0.4412 (1.67)
NPERHH	0.1346 (1.41)	-0.1001 (1.43)
HEALTH	0.2045 (1.00)	-0.1752 (1.41)
MARRY	-0.2020 (0.51)	3.8910 (3.33)
CONSTANT	-2.6196 (1.38)	-7.1132 (*)
n	1033	1091
% U	4.5	8.2
L.L.	-178.45	-285.77

T-STATISTICS IN PARENTHESES

* Did not pass Tolerance Test

TABLE A3
 FEMALE YOUTHS : FULL SAMPLE USING OTHINC

VARIABLE	1974	1978
OTHINC	-0.000076 (0.76)	-0.000082 (2.13)
REGION	0.2643 (2.19)	0.1595 (2.72)
AGE	-0.1573 (2.32)	-0.1595 (3.87)
COUNCIL	0.0879 (0.57)	0.1787 (1.82)
MORTGAGE	-2.5045 (1.17)	-2.6443 (1.60)
SCHOOL	-0.0670 (0.44)	-0.3255 (2.79)
RELN	-0.6742 (2.61)	-0.1584 (0.84)
PANAT	0.1127 (0.45)	0.0909 (0.60)
NPERHH	0.0853 (0.91)	0.0783 (1.21)
HEALTH	0.1384 (0.65)	-0.0408 (0.45)
MARRY	-0.3071 (1.42)	-0.2139 (1.59)
CONSTANT	-1.7751 (*)	1.4161 (*)
n	1190	1338
% U	4.6	11.1
L.L.	-213.83	-439.64

T-STATISTICS IN PARENTHESES

* Did not pass Tolerance Test

TABLE A4

FEMALE YOUTHS : RESTRICTED SAMPLE USING OTHINC

VARIABLE	1974	1978
OTHINC	-0.000060 (0.53)	-0.000095 (2.42)
REGION	0.3367 (2.59)	0.1442 (2.39)
AGE	-0.1633 (2.19)	-0.1498 (3.48)
COUNCIL	0.1275 (0.77)	0.1857 (1.82)
SCHOOL	0.1123 (0.68)	-0.2413 (1.95)
BLACK	0.3969 (1.21)	0.3050 (1.27)
NPERHH	0.0984 (1.01)	0.0419 (0.63)
HEALTH	0.1989 (0.87)	-0.0548 (0.58)
MARRY	-0.3387 (1.51)	-0.0820 (0.59)
CONSTANT	-1.7183 (0.74)	3.2853 (1.92)
n	1082	1195
% U	4.5	11.6
L.L.	-190.81	-406.70

T-STATISTICS IN PARENTHESES

TABLE A5

MALE YOUTHS : FULL SAMPLE USING SEG INDICATORS

VARIABLES	1974	1978
MANUAL	0.4216 (2.09)	0.2906 (1.77)
ARMY	0.9898 (2.32)	1.9416 (*)
REGION	0.1402 (1.23)	0.3810 (4.34)
AGE	-0.0689 (1.14)	-0.1508 (2.78)
COUNCIL	-0.0604 (0.40)	0.1090 (0.77)
MORTGAGE	-0.6516 (1.67)	2.3003 (*)
ED2	0.1768 (1.23)	0.3860 (2.87)
RELN	-0.5957 (2.58)	2.0891 (0.19)
BLACK	-0.0558 (0.14)	0.6301 (2.26)
NPERHH	0.1325 (1.52)	0.0964 (1.19)
HEALTH	0.111 (0.56)	-0.2015 (1.37)
MARRY	0.3046 (1.28)	3.9293 (0.35)
CONSTANT	-2.5612 (1.57)	-7.7404 (*)
n	1546	945
% U	3.8	7.4
L.L.	-236.83	-217.86

T-STATISTICS IN PARENTHESES

* Did not pass Tolerance Test

TABLE A6

MALE YOUTHS : RESTRICTED SAMPLE USING SEG INDICATORS

VARIABLE	1974	1978
MANUAL	0.4107 (1.63)	0.2297 (1.47)
ARMY	1.2933 (2.78)	-1.8958 (*)
REGION	0.0969 (0.69)	0.4148 (4.80)
AGE	-0.1050 (1.37)	-0.1401 (2.55)
COUNCIL	0.0372 (0.21)	0.1111 (0.82)
ED1	-0.1090 (0.42)	0.4807 (1.94)
PANAT	-0.4112 (0.77)	0.5362 (2.86)
NPERHH	0.2187 (2.33)	0.0936 (1.20)
HEALTH	0.2778 (1.26)	-0.2579 (1.81)
MARRY	-0.1591 (0.39)	3.3941 (*)
CONSTANT	-1.5579 (0.77)	-8.4023 (6.47)
n	1041	993
% U	3.7	7.5
L.L.	-156.60	-232.02

T-STATISTICS IN PARENTHESES

* Did not pass Tolerance Test

TABLE A7

FEMALE YOUTHS : FULL SAMPLE USING SEG INDICATORS

VARIABLES	1974	1978
MANUAL	0.5730 (3.22)	-0.0333 (0.21)
ARMY	-2.9647 (*)	-2.9735 (*)
REGION	0.2177 (1.61)	0.1843 (2.18)
AGE	-0.0598 (0.80)	-0.1382 (2.17)
COUNCIL	0.1754 (1.02)	0.3276 (2.20)
MORTGAGE	-1.9041 (*)	-2.1305 (*)
ED1	-0.2560 (1.11)	-0.2650 (1.16)
RELN	-0.6727 (2.44)	-0.2055 (0.37)
BLACK	-0.3225 (0.62)	0.0650 (0.17)
NPERHH	0.0941 (0.94)	0.0571 (0.75)
HEALTH	0.1129 (0.45)	0.0298 (0.23)
MARRY	-0.2060 (0.84)	-0.3712 (0.92)
CONSTANT	-7.5060 (3.97)	-5.3532 (3.30)
n	1237	710
% U	3.6	9.7
L.L.	-176.88	-216.583

T-STATISTICS IN PARENTHESES

* Did not pass Tolerance Test

TABLE A8

FEMALE YOUTHS : RESTRICTED SAMPLE USING SEG INDICATORS

VARIABLE	1974	1978
MANUAL	0.6373 (3.18)	-0.0511 (0.32)
ARMY	-2.6443 (*)	-2.8275 (1.71)
REGION	0.2073 (1.42)	-0.1753 (2.08)
AGE	0.0032 (0.04)	-0.1393 (2.19)
COUNCIL	0.0915 (0.50)	0.3118 (2.10)
ED1	-0.3102 (1.18)	-0.3110 (1.37)
BLACK	-3.5629 (0.28)	0.2909 (0.55)
NPERHH	0.1936 (1.82)	0.0770 (1.02)
HEALTH	0.1343 (0.49)	0.0251 (0.19)
MARRY	-0.1383 (0.55)	-0.0224 (0.04)
CONSTANT	-10.8170 (0.83)	-3.9278 (*)
n	1152	698
% U	3.2	9.7
L.L.	-151.38	-212.915

T-STATISTICS IN PARENTHESES

* Did not pass Tolerance Test

CHAPTER 8

SUMMARY AND CONCLUSION

I. INTRODUCTION

In recent years considerable concern has been expressed about the apparent malfunctioning of the youth labour market and, in particular, with the most dramatic manifestation of this in terms of the number of young people without work. Motivated by the depth of feeling surrounding the issue, this study has attempted, by a variety of means, to cast further light onto the problem of youth unemployment in post-war Britain. Although this final chapter has no further analytical contribution to make, it does perform the necessary functions of unifying the present research findings and, more importantly, of venturing certain conjectures as to where we stand in our attempt to understand the problem at hand. The next section therefore presents a summary of the foregoing work, whilst Section III provides an overall conclusion and considers the policy implications of the findings.

II. RESUME

Having noted at the outset that we do not in fact have a satisfactory economic definition of youth in terms of the characteristics which young people possess, the body of the study commenced with a review of recent theoretical developments purporting to enhance our understanding of the phenomenon of unemployment. None, however, has evolved with the unemployment behaviour of any specific group in mind and one must, therefore, ask of each not only what their general contribution is, but also to what extent they contribute to our comprehension of the specific issue of youth joblessness.

But, in order to place recent work into historical perspective, the review began with a brief discussion of the Keynes .v. Classics debate. This was not exhaustive, as the literature surrounding the controversy is voluminous. Rather the aim was simply to draw attention to the fact that the dispute evolved in the context of an aggregate labour market, within which labour was homogeneous. This silence on how any unemployment might be distributed can be seen as one upshot of the lack of a micro-economic foundation in traditional macro-economic theorising and the ensuing bulk of the review focused upon certain of the attempts recently made to rectify this situation.

So called equilibrium theories, in which unemployment is ex-ante voluntary, were the first to be considered, beginning with search theoretic developments. The normal characteristic of these is that, within the confines of a known wage distribution, individuals have imperfect information regarding the availability of job offers and must undertake costly search to improve their knowledge. Under standard assumptions the reservation wage property results which states that search will continue until its marginal cost equals its marginal benefit. As most models are concerned with full-time search, income received whilst unemployed is a central determinant of the reservation wage. This has served to ensure that unemployment benefits continue to attract considerable attention in empirical studies and the controversies this has generated were later discussed in their own right.

Whilst search theory has undoubtedly contributed to the increased sophistication which has been brought to bear on the economic analysis of labour markets, it has yet to fulfill its early

promise. Piecemeal revisions are frequently made to inject greater realism into the basic structure, but a comprehensive search theoretic attempt at modelling the labour market life-cycle has not yet appeared. Of the criticisms levelled at standard frameworks, those relating to the assumptions of a known wage distribution, risk-neutrality and an infinite time horizon, plus the fact that quits and lay-offs are not recognised, introduce at least the suspicion that the application of search theory to the behaviour of young people should be treated with caution.

The second strand of equilibrium reasoning to be considered was that body of work falling under the rubric of contract theory. It was noted that, somewhat paradoxically, whilst the unemployment implications of this research have received the most attention, its principal contribution lies in its analysis of joint welfare maximising employment agreements between firms and their workers. In particular, it offers one rationalisation of why we observe sticky wages, with differential risk attitudes leading employers to provide income-smoothing on behalf of their employees. The problem is, however, that what we tend to observe empirically is nominal wage rigidity.

For the theory to predict unemployment, leisure needs to have a positive value to the individual and therefore, in common with search theoretic developments, the role of (exogeneously financed) unemployment benefits have assumed considerable importance in generating the usual lay-off result. But the fact that unemployment in the mainstream contributions to the literature takes the form of lay-offs has attracted criticism, due to their lack of empirical

importance. Furthermore, this unemployment is always less than that which would obtain in spot auction markets. In fact, to generate real, firm initiated separations contracts have to be broken. For contracts to hold at all some economic glue is required and this, it is normally assumed, will take the form of human capital investments. This, however, prompts the further observation that not all workers will be offered contracts and not all employment relationships are long lasting, as they are envisaged to be in the contract world. In particular, young people will either not be offered contracts or will be covered by very weak ones. Without prior specification of the nature of the youth employment relationship, and the market structure within which their employers operate, it is difficult to derive unambiguous predictions from contract theory as to how their absolute, or relative, unemployment will behave.

Following a discussion of the empirical controversies which have arisen over the magnitude of the effect of the payment of unemployment benefits on unemployment, which have centred principally on the measurement of the former, the review concluded with a brief examination of the contribution made by disequilibrium theory to the unemployment debate. The overall impression gained is that the bulk of the intellectual effort has gone into the statistical estimation of relationships in non-clearing markets, rather than into a sharpening up the reasoning employed in this branch of analysis. In particular, little is said about why wages should be sticky both up and down and why, in consequence, excess demand and excess supply regimes respectively should persist for long periods of time, as it has been argued that they have in the post-war youth labour market.

Prices are central to all economic theorising and analyses of the labour market constitute no exception. However, in empirical applications, the wage is a slippery concept and inferences made about it from the behaviour of published statistics need to be hedged with caution. Chapter 2 sought to describe and analyse the post-war behaviour of probably the historically most widely used indicator of pay, namely the Department of Employment's Earnings Inquiry. In particular, it focused upon the earnings of young people relative to those of adults. The first task, however, was to indicate the nature of the caveats attached to the data. Specifically, the imprecise relation of earnings to the price paid by employers, and the return perceived by workers, was examined and contrasted for the differing groups under study. It was noted that the problems may be most severe when the earnings of part-time females constitute the comparison. Furthermore, the figures refer to manual workers whilst the economy has become increasingly white-collar and, in addition, do not cover all industries.

Increases in all of the youth-to-adult earnings relatives can be detected at some point in the period 1950-1976, but these were often not sustained and there is some evidence of decline beyond the latter date. Furthermore, the NES, with its more comprehensive coverage, does not appear to convey the same message. In all, interpretation of the movements which have occurred has often been a highly subjective affair. Of the most popular influences cited by commentators as being responsible for increases in the relative earnings of youths in the 1970's, four were considered in some detail. Firstly, there is the age-wage effect of ROSLA, but if age

is positively related to productivity it is hard to see why this influence should have been harmful to youth. Secondly, there is the supposed differential compressing effect of pay policies. This line of reasoning appears problematic, however. Thus, if participants in the labour market exhibit rational expectations, incomes policy should not distort equilibrium relationships. Indeed, even without adopting this fairly extreme posture, one might expect ex-post slippage in, for example, non-pecuniary benefits in the case of nominally binding policies. Thus, whilst one might predict some impact on monetary differentials, this need not imply that young people will thereby become "over-priced". Thirdly, the possible influence of the Equal Pay and Equal Opportunities legislation was examined. To the extent that any nominal impacts were mirrored in real magnitudes then these enactments should have augered well for young workers, especially males. Finally, arguments regarding the impact of trade unions and wage councils on earnings relatives were considered, with the conclusion being not that it is impossible that they were the cause of disequilibrating movements, but rather that the case seems somewhat implausible.

From this discussion of possible special influences on relative earnings movements in the 1970's, the work proceeded to a more general analysis of their behaviour over the period 1950-1972. Whilst it proved possible, particularly for young males, to achieve statistical results that were good overall in the simplest formulations involving just basic supply and demand influences, or their unemployment outcome, individual parameter estimates were not altogether convincing. This led therefore to an examination of a

rather more embellished framework which attempted to control for labour heterogeneity.

One of the strongest results to emerge from this analysis was that, as one might expect, the relative earnings of young people are positively related to their average age. Fairly convincing support was also found for the hypothesised pro-cyclical nature of the relatives and for their positive association with relative hours of work. The notion that they should be negatively related to the proportion of youths entering apprenticeships was soundly refuted by the data; reflecting, perhaps, the inappropriateness of the maintained hypothesis that average apprentice earnings are less than those of other youths. Equally, the supposed negative influence of supply on earnings was consistently refuted. Finally, the Industrial Training Act would appear to have had a negative effect on relative youth earnings; although the dummy variables used to capture the impact of this legislation might have been picking up other influences, such as the Equal Pay Act. Having managed to account for a good deal of the movement in relative youth earnings, however, the question remains whether the influences identified are equilibrium in nature or amount to institutional rigidities, as might be argued in the case of the age and apprenticeship variables for instance. The study therefore proceeded to examine the time-series employment fortunes of young people directly.

Looking at the age breakdown of employment provided by the four post-war decennial censuses of population, it would appear that the seeds of the problem faced by young people in the labour market of the 1970's and 1980's were actually sown in the 1960's. Thus, over

the decade 1961-1971 the job losses of youths aged less than 20 amounted to over 20 per cent of the total at its outset, and were larger than those recorded in the ensuing ten year period. Indeed, older females were the only group whose employment grew over this whole twenty year epoch. The principal focus of the work, however, was on the industrial distribution of the labour force by age-sex group and how this has evolved through time.

Changes in industrial definitions make strict temporal comparisons hazardous, but certain enduring aspects of the employment distribution are discernible. Looking first at the concentration of the workforce, most conventional indicators of this yield a fairly stable hierarchy over the thirty year period studied. Running from the least to the most concentrated group this is adult males, young males, young females and adult females. Also the similarities by sex are greater than those by age-group. Furthermore, this correspondence extends beyond index values to the identity of the industries which are important employers of the age-sex groups. However, measures of concentration depend critically on how industries are defined and consequently how many of them there are. Thus under the 1980 SIC revision, which made the average size of base industries smaller, the concentration of male and female youths has moved closer together and, in 1981, five SIC Classes accounted for about 45 per cent of both groups in work.

In terms of specific areas of economic activity, young people are located most heavily in the non-manufacturing sector; as indeed is the workforce in general. Certain important differences do exist however. In particular, as one would expect, the very large

population of boys found in construction is not mirrored in the girls employment distribution. Perhaps rather more surprising, however, is the fact that retail distribution is immensely significant to both; as is public administration, although to a lesser extent.

In addition to absolute concentration, the work also examined industrial factor intensities, where the factors were defined as the four age-sex groups. This revealed some quite startling statistics. Thus, in some industries, girls were more than three times as heavily represented as in the economy as a whole, with slightly less extreme, although still heavy, over-representations being found for young males. Furthermore, the specialising industries were markedly different, with certain traditional industries, such as construction, timber and fishing, "specialising" in boys whilst girls were most heavily favoured in "light" service industries. Two of the important corollaries of this are, firstly, that some industries employ virtually no young people (perhaps for legal reasons) and, secondly, that adults utterly dominate some (e.g. 96% of workers in the chemical industry are adult males and 86% in domestic services are adult females). The natural extension of separate exercises looking at snapshot data on labour concentration and intensity by industry is to combine them and examine what influence they have had on the employment fortunes of young people through time, and this was achieved in the last part of Chapter 4 by the means of shift-share analysis.

It was not possible in this latter exercise to utilise a comprehensive breakdown of the industrial structure owing to the various definitional changes in the SIC which have occurred through time; but, interesting features did emerge from the broad-brush

analysis undertaken. Thus, only in the first of the three decades examined did young males benefit in the aggregate from changes in their share of the employment in the individual sectors identified. Additionally, in all periods, they suffered from simply "being in the wrong place", as represented by the structural change effect. For young females the picture was somewhat different. They lost out in all periods from declining shares but, on the other hand, this was always countermanded to some extent by their heavy absolute presence in growing sectors. The only group to consistently benefit from both share and structural effects were adult females and from this one might be tempted to infer that their employment expansion has been at the expense of young workers. However, shift-share is really little more than an ex-post accounting device which has many fervent detractors and, whilst some of the criticism is probably misplaced, the work proceeded from this spring-board to examine the behaviour of youth unemployment directly.

The time series behaviour of youth unemployment was its first aspect to attract attention in Great Britain, due largely to something like a ten fold increase in its absolute magnitude in the late 1970's, and this was the issue examined in Chapters 5 and 6. Prior to model specification and analysis came the task of specifying which dimensions of the phenomenon were to form the object of study and the decision was made to model the percentage rate of youth unemployment and its absolute magnitude relative to that of adults of the same sex, with particular reference in both cases to young people aged under 18. Because school-leavers are often felt to create special problems for the analysis of youth unemployment, it has been a standard practice to attempt estimation both including and

excluding them. Strictly speaking, however, exclusion is not possible when the rate of youth unemployment is considered and the distinction was in general only pursued in the case of relative unemployment. Having observed the behaviour of the chosen objects of study through time, with the rate of youth unemployment being noticeably trended whilst the relatives moved much more erratically, the possible determinants of youth unemployment in the aggregate were discussed in some detail.

Hypothesis number one was that both percentage and relative youth unemployment should be negatively related to the cycle. This in itself is a standard presumption, although too little attention appears to have been devoted to how economic activity should be measured. Use of adult unemployment rates is likely to suffer from an endogeneity problem which can most straightforwardly be overcome by the use of an output measure direct. But, nevertheless, the relationship between youth and adult unemployment rates does attract ongoing attention and preliminary estimates revealed the usual positive coefficient well in excess of unity. The more comprehensive work which followed, however, turned to GDP as the appropriate cyclical indicator. In addition, arguments were also put forward for expecting youth unemployment to be negatively related to the rate of change of output.

The potential influence of pay on the unemployment of young people was the second issue to be considered and the distinction between real and relative measures of the variable recognised. When own real earnings are used in the vector of regressors in an unemployment rate equation the standard theoretical expectation is

for the coefficient to be positive. For relative earnings, however, the case is less clear-cut, as it is possible for factors to be either substitutes or complements. In principle, this gives several available relatives to be explored, although various considerations impinged to restrict attention simply to the four involving the youth group under study. It was further decided to examine only the impact of the relative earnings of the two groups in question when relative youth unemployment was under consideration.

Most theoretical approaches lead to the conclusion that if firms are output constrained, then unemployment will respond positively to changes in labour supply and this was the next working hypothesis to be adopted. Unfortunately, however, the supply of labour is not only a slippery empirical concept, it may also be endogeneous to models examining unemployment. It was therefore decided to proxy this influence using absolute youth population in the unemployment rate equations and the relevant population ratio in those examining relative youth unemployment. As there is no available population data which corresponds exactly to the unemployment statistics used, two alternative measures were selected for experimentation in the empirical analysis undertaken.

The approach adopted to the study of human behaviour by economics makes it very difficult for its practitioners to deny that the payment of unemployment benefit will have some positive effect on the level of unemployment. However, there remains considerable scope for disagreement over how unemployment benefits should be measured empirically in unemployment studies and, consequently, how large is their real effect and also the economic significance of any

unemployment so generated. The measurement problem in the case of young people is perhaps not so severe as when adults are being considered and, in the unemployment rate models, serious objection can probably not be taken to the use of the youth supplementary benefit level through time, whether in real or replacement ratio terms. However, in the case of the relative unemployment models a decision had to be taken on how to measure the benefits receivable by adult males to enable a relative variable to be constructed and the case was made for this to be approximated by the supplementary benefits payable to a married man with two children. As for adult females, the problems raised in considering the return to their unemployment were felt to be so thorny as to render it impossible for any control to be effected in equations which included them as the comparator. Measurement problems aside, however, it is clear that simple studies, such as the one undertaken, can say nothing about the economic significance (e.g. in terms of the efficient allocation of labour) of any benefit-induced unemployment that is identified.

Of the other influences considered for inclusion in the vector of regressors, four received special attention. Firstly, it was argued that, *cet. par.*, ROSLA should have had only a once-over effect in the year in which it became effective. This was to be explored by means of a simple dummy variable. Secondly, it was recognised that the limited vector of regressors may omit certain important determinants of youth unemployment. Without specifying precisely what these might be, the decision was made to incorporate a linear time trend in the hope of accounting for at least some of these.

Whilst the remaining two influences may undeniably be potentially important in the determination of youth unemployment, it was not felt possible to make any specific allowance for them in an aggregate British time-series study. These were the fortunes of relatively highly youth intensive industries and the level of adult female participation in the labour force. In the case of the former this was because the absolute size of industries is important as well as their youth intensity, thereby leading to ambiguity in any readily derivable index. The principal problems surrounding female participation in the present context also revolve around its measurement, as it is known that older women represent a group with a relatively low propensity to register their labour market attachment. However, although the omission of this influence appears potentially serious, at an empirical level it is likely that the linear time trend will capture much of its movement through time. The bias introduced on this score should not, therefore, be unduly serious.

Having specified the general form of the model to be investigated, the statistical analysis of its performance was undertaken. In the first place this involved the estimation of a reduced form over the whole data period. Even this, however, was not entirely straightforward; for whilst the unemployment data series runs through to 1982 before being the subject of major revision, the definitions used in the earnings series were changed from 1980 onwards. To guard against the errors in variables that this might create, the model was therefore estimated with terminal dates of both 1979 and 1982. In qualitative terms the choice made little difference, although the quantitative magnitude of the individual

coefficients were sensitive to the estimation period. The principal findings from this initial exercise were that youth unemployment, whether measured in percentage or relative terms, appears to be strongly counter-cyclical except, perhaps, in the case of youth to older females. However, something of a puzzle emerged in the unemployment rate regressions, as the results suggested that it varied inversely with the rate of change of national output. The simplest possible rationalisation of this appears to be that periods of rapid growth are associated with labour-saving technical progress.

Whilst the weight of the evidence did suggest a significant relationship between youth earnings and unemployment, support for the argument was not universal. Thus, when own real earnings were the measure utilised, they only achieved significance in the equations modelling the rate of female youth unemployment. When relative earnings were used the picture was slightly more clear-cut, with the evidence from the unemployment rate equations being that both youth groups were substitutes for adult males and complements for part-time adult females. However, the results from estimating the boys' unemployment relative to adult male equations did not wholly support the former conclusion. This may of course simply be a reflection of the weaknesses in the earnings data used but, as the same series forms the basis of the stronger conclusions reached by various other commentators, it should be the signal for caution.

The preliminary results obtained for the labour supply measures were also decidedly mixed. In the case of the unemployment rate equations they were always incorrectly, negatively signed, although not significant, and, whilst usually correctly signed, they were also

insignificant in the relative unemployment models. This might be taken as support for the notion that the youth labour market is one where excess supply prevails. However, this would be hard to rationalise for the full thirty year period studied.

In the unemployment rate equations, those incorporating the real level of benefits out-performed those using the replacement ratio. However, whilst most of the simple evidence pointed in the direction of some positive impact on joblessness, the statistical support was not strong. Furthermore, support for the hypothesis from the relative unemployment regressions was weaker still; thus leading to the impression that, within the range of values historically taken by unemployment support, its impact has not been great on the stock of jobless youth.

Of the two remaining influences, the ROSLA dummy variable was consistently perversely (positively) signed indicating that, if the legislation did have any once-over effect on youth unemployment this was swamped by the impact of other countervailing occurrences - of which the first oil-crisis would appear to be the leading contender. Secondly, the time trend conveyed differing information depending on the unemployment configuration under study. Thus, the rate of youth unemployment has been upward trended for reasons not incorporated in the models analysed. Relative youth unemployment, however, has not suffered the same fate and, when school-leavers are excluded from the measure, there is some evidence to suggest that its secular movement has been downwards.

As stated, the qualitative impressions created by the models estimated either to 1979 or 1982 were not unduly different, although there was considerable instability in the magnitudes of the estimated

coefficients. Confirmation that these differences were non-trivial was obtained when the models estimated to 1979 were used to forecast the final three observations, when substantial errors were generated. This was true even for the unemployment rate equations, which displayed reasonably good overall statistical fits - a criterion which is usually regarded as one measure for judging whether an estimated equation can be used for forecasting purposes, irrespective of how well determined its individual coefficients may be. The tendency in this case was for increasing under-prediction, which would tend to suggest that the early youth orientated intervention by government in the labour market did not meet with a great deal of success. However, when forecasts were derived from the estimated relative unemployment regressions there emerged a definite tendency for over-prediction. Thus, whilst there appears to have been an unexplained upward shift in the level of youth unemployment in the 1980's, it does not appear to have been as great as that which occurred in the unemployment of adults. To that extent, the job creation measures may in fact be viewed as having had some effect; although it has never clearly been stated that redistribution of the unemployment burden is the policy objective.

Having shown that there appears to have been a breakdown in the late 1970's in pre-existing unemployment relationships, it was prudent to enquire whether it is reasonable to assume that one single particular model should have held true over the three decades prior to 1980. In particular, attention was focused upon the labour "shake-out" of the mid 1960's to see if this appeared to have been responsible for any structural change in four of the worst fitting

youth unemployment equations. In order to undertake this exercise, the ROSLA dummy variable had to be dropped from the vector of regressors and although this then meant that mild support was provided for all prior hypotheses, except that regarding the speed of change of GDP, it did serve to increase disquiet regarding the sensitivity of the models to precise specification when estimated over the full data period. It is probably unsurprising, therefore, that significant statistical support was found for the existence of structural breaks in all the models examined.

Looking at the sub-periods taken individually, it was immediately apparent that the overall performance of the estimating equations was much improved. Also important, however, was the sign and size instability of the coefficients both between sub-periods and between these and the full sample estimates. Furthermore, the pattern of coefficients which did emerge for each sub-period were not altogether consistent with the frequently voiced assertion that there occurred a regime switch from an excess demand era to one of excess supply. In the light of such unsatisfactory results, the study therefore proceeded to examine whether there was any evidence that simultaneous equation bias, due to the possible endogeneity of the earnings variables, was in some way to blame.

To undertake the simultaneous equation analysis certain modifications to the previous single equation models had to be made, in view of both data and statistical considerations. One of the more major was that attention switched to the relative unemployment of males below the age of 20, although the delimiter used for females remained 18. For expositional purposes, interest focused on the comparison with adult males. To allow estimation to be undertaken

using all observations to 1979 a simple earnings function was required, whose principal arguments were relative unemployment and a control for the effect of ROSLA on the average age of the youth labour force. In preliminary, single equation estimation the model did not perform well, with the cyclical indicator being perversely signed in all cases. Furthermore, single equation results for the unemployment models using the new age definitions produced some noticeable changes from the results derived earlier, thereby suggesting dissimilar unemployment experiences for youths of differing ages. This latter is clearly disturbing if a simple rationalisation of "the" aggregate youth unemployment problem is being sought.

When attention was turned to the joint estimation of the unemployment and earnings equations it was found, perhaps disappointingly, that simple simultaneity problems were not the root cause of the rather poor results earlier achieved. At the end of the day, the strongest conclusion that can be drawn from the time-series exercises is that the relative unemployment of young people is strongly counter-cyclical. However, reasonably convincing evidence re-emerged that it was adversely affected by the rate at which output changes. As for relative youth earnings, all the evidence pointed to their being positively related to relative unemployment, which strongly suggests that employment composition effects are at work through the cycle. In addition, relative youth earnings appear to have significantly increased beyond 1973 which, it was tentatively suggested, might reflect the age composition effect of ROSLA.

The overall message from the time-series analysis was that the instability observed in the face of, frequently minor, specification changes should serve to temper the enthusiasm with which individual well fitting and well behaved regression results are greeted. It seems likely that the aggregate nature of the data and the limited degrees of freedom it affords may serve to bedevil any utterly satisfactory explanation of the phenomenon of post-war British youth unemployment. Rather more progress might be possible with data on individuals and this therefore constituted the final issue to be addressed in the body of the present work.

However successful the modelling of aggregate time-series youth unemployment turns out to be, it will give no real indication as to how any given amount of joblessness will be spread amongst the members of the young labour force. Chapter 7 therefore aimed to provide a more complete picture by examining this latter issue directly. In particular, an attempt was made to specify those personal and environmental characteristics which theoretical considerations suggest should be important determinants of the probability that a young person be unemployed, rather than in work, at a given moment of time (and therefore level of aggregate labour market pressure).

Six personal characteristics were identified as potentially important. The first of these was the educational attainment of the individual, which, on both human capital and signalling grounds, seems likely to impact negatively on the likelihood of unemployment. But

formal education is not an all-or-nothing attribute and various alternative specifications were explored based on level of educational attainment and years of schooling. Secondly, the role of age was considered, in recognition of the fact that the distinction between youth and adulthood is not one that is hard and fast. From both general demand and supply considerations, the presumption was that older youths would be the less likely to be unemployed at a moment of time than their younger contemporaries. Thirdly, it was proposed, for similar reasons to those outlined for age, that the marital status of young people should influence the likelihood that they are in or out of employment. Fourthly, in common with most studies of the labour market performance of individuals, it was hypothesised that race might be an important consideration; the most usual reasoning being along discrimination lines, although it must be borne in mind that this could actually occur in pre-labour market times and only later be manifested in work opportunity. Fifthly, the range of personal characteristics considered included a discussion of the potential influence of health. With the data set in use, comprising only those declaring labour market attachment, it was, however, argued that the a priori direction of impact of this is ambiguous. Finally, when the full sample of data was employed, a distinction was made between those living in the house of a relative and others. The former, it was argued, should be more able to share the income of other family members and hence be able to afford more protracted job search or more unemployment holidays.

In addition to these personal characteristics, three general environmental factors were considered as possible important influences on the probability of unemployment. The first of these was family

background. The fairly popular, but still somewhat vague, presumption is that children from "better" or "less deprived" homes have greater life-chances, and are perhaps better motivated. However, not only is family quality difficult to assess, the data source used centres on households rather than the traditional domestic unit. Nevertheless the argument could not be ignored because of this, although it was appropriate to explore alternative proxies for the ideal measure. Specification number one utilised other family income - defined as total household income net of that of the respondent - whilst specification two employed a truncated SEG classification, essentially distinguishing between those with blue and those with white-collar fathers. Use of these alternative formulations, however, introduces something of an ambiguity. Thus, parental employment status is normally assumed to impact positively on the work prospects of children. However, if income is the family background measure considered it seems more in accord with traditional reasoning to recognise that the greater this is, the more unemployment can be afforded, whilst at the same time stressing family quality influences. In this case, therefore, no prior prediction was offered. But both of these alternatives are fairly blunt, taking no account, for instance, of the amount of other income available per capita. For this reason, an additional control was entered in all cases enumerating the number of persons residing in the interviewee's household.

The two remaining influences considered were rather more straightforward. In recognition of the interest that has recently been shown in the relationship between housing tenure and unemployment, the issue was felt worthy of exploration in the case of the young. The particular hypotheses explored were that those living

in council housing will be the more likely to be unemployed, for financial and motivational reasons, and those with a mortgage less likely to be so than those fulfilling neither criterion. Lastly, because the state of the aggregate labour market at any moment conceals a number of inequalities, some attempt was made to control for the regional aspect of this by entering the unemployment rate within the standard region within which the respondent resided.

Having specified a model such as the above, usual practice has then been to estimate it on a single year's cross-section of data. This is alright as far as it goes, although one is being asked to take a considerable amount on trust if it is argued that the results obtained can be generalised to all time periods. Apart from general structural change, the stage of the economic cycle at which the analysis is undertaken may be an important inherent influence on the results obtained. For this reason, the analysis of Chapter 7 examined two non-consecutive years of data taken from the General Household Surveys of 1974 and 1978; between which dates recession had firmly set in. The decision was then taken to, (1) estimate the model separately by sex and, (2) then to examine each of the data sets generated both in full and restricted to only those individuals residing in the household of a relative. The definition of youth adopted in the analysis was widened to include those up to and including 24 years of age - in line with official European practice - thereby generating comparatively large numbers of observations.

Estimation confirmed that splitting youth by sex for analytical purposes is probably appropriate, for rather fewer influences appear to determine the likelihood of unemployment amongst young females than was the case for their male counterparts. However, two factors were

more or less consistently strong, irrespective of sex or year. These were region of residence and age. The former variable, measuring the localised rate of unemployment was found to positively influence the probability that a young person will be out of work, whilst the latter was shown to be a negative determinant. Both results, therefore, confirmed prior expectations.

As was thought likely, the findings indicated that the cycle has decidedly non-neutral effects across individuals. In the case of both sexes it appears that council house dwellers suffered significantly from the onset of recession. Non-white and the less well-educated young males seemed also to suffer disproportionately. Although the evidence was slightly less strong, it also appears that less formally educated females endured the same fate. The patterns to emerge for the other influences considered were somewhat less clear-cut, although not totally negative. Thus suggestive evidence was found to the effect that those youths living at home may be less prone to unemployment than others, whilst those living in large households may be more afflicted. In the case of males, it further seems that the possession of a mortgage positively increases the likelihood that they will be in work. One interesting anomaly to emerge in the results was that other household income appears to positively increase the chance that a young man will be out of work, whilst decreasing the risk for young females. However, when family background was proxied by fathers socio-economic group the children of manual workers were the more likely to be jobless, irrespective of sex. Finally, no convincing evidence was produced that health or marital status had any effect at all on unemployment probabilities. Attention is now therefore turned to the conclusions which can be drawn from the work in its entirety.

III. CONCLUSION

It seems hard to deny the proposition that the modern day youth labour market in Great Britain is exhibiting a persistent failure to operate with classical economic efficiency. Whether in fact it has ever done so is a moot question. Nevertheless, early post-war experiences, in what was rather paradoxically a very Keynesian era, led many to more or less implicitly believe that, barring shocks and frictions, youngsters not in school would have little difficulty in finding work. Even in the face of unprecedented peace-time levels of direct government intervention, few would accept this view of the young persons' labour market of today. However, it is a frequent, and usually necessary, research strategy to look to the past in order to attempt to understand the present and to predict the future. This in essence was the approach adopted here.

The principal aim of the work was to explore various issues of relevance for a better understanding of the phenomenon of youth unemployment. A thorough approach to this required that several independent sets of data be explored; in this case looking at youth employment, earnings and then unemployment directly. Immediately, however, this leads one to realise that there is conceptually no precise definition of youth that is useful for economic purposes and, furthermore, that there is not even an agreed administrative age delimitation which is applied in common to all relevant labour market statistics. Data inconsistencies of one form or another therefore represent a caveat to be borne in mind even when simply interpreting the results of the analysis in a historical context. More than this, however, it seems clear that one should exercise rather more caution

than is usual in applying the specific lessons of history to the contemporary situation.

At one level this again relates to statistical considerations, with the past decade or so having witnessed various changes of definition in the official labour market data. On a more substantive note, however, it has to be noted that the British economy is presently in the throes of a particularly severe recession, with unprecedented levels of direct government labour market intervention directed at ameliorating some of the most disturbing manifestations of this. As such, it is most unlikely that the underlying structure of the market remains unchanged from what it was in previous years. Nevertheless, whilst bearing these problems in mind, the following represents the principal conclusions of the research.

When put into historical perspective, the aggregate rate of youth unemployment at the turn of the present decade was indeed found to be somewhat higher than it was predicted to be on the basis of previous, overall well-fitting, statistical relationships. This is in spite of the fact that the government's job creation measures were at the time being stepped up in intensity. Such a finding immediately, therefore, hardens the aforementioned suspicion that the youth labour market has, in recent years, entered into a new regime and further brings into question the present day relevance of even strong historical findings.

However, returning to the possible effects of government intervention in the market, the models estimated for earlier years to explain the ratio of youth to adult unemployment consistently over predict this measure of joblessness amongst the young in the early

1980's. This suggests that, whilst the level of youth unemployment was higher than one would be led to expect on the basis of historical experience, the job creation measures in force had served to redistribute the overall unemployment burden to the benefit of the young. According credit for the latter to government intervention in the market is, of course, speculative. If the conjecture is correct, however, the important thing to bear in mind is that the outcome is not altogether consistent with any declared policy objective. Thus, whilst statements have been made regarding the desirability of reducing the general extent of unemployment and also of that amongst youths considered in isolation, it has not been explicitly stated that young people should benefit at the expense of others. Furthermore, without more detailed knowledge regarding the relative economic, personal and social costs of joblessness amongst different groups than we have at present, it is hard to see how any such policy goal can rationally be arrived at. Equally, it is also difficult to arrive at a judgement of the observed outcome without this further information.

Bearing in mind the foregoing caveats regarding the likelihood of the modern day labour market having a different structure to that of earlier times, the strongest finding regarding aggregate youth unemployment which emerged is that it is strongly counter-cyclical; whether considered in isolation or relative to that of adults. However, it might be objected that output has recently been increasing at a respectable rate when judged by British historical standards and yet the youth unemployment problem looms as large as ever. The clue to what is going on may lie in the tentative finding

that youth unemployment is positively related to the speed at which GDP changes. Earlier it was argued that output may change most quickly in times of labour-saving technological change or reductions in X-efficiency (Liebenstein (1966)) and some fear that the present IT revolution constitutes one example of the former whilst the current Conservative government is showing a great deal of interest in issues pertaining to the latter. In effect, we may be experiencing a repetition of the mid-1960's labour shake-out, which, according to a certain amount of the evidence unearthed above, apparently worked to the relative detriment of the young.

Much weight has been attached in recent years to the supposedly positive impact that the wage levels of young people have had upon their unemployment. The evidence unearthed above from aggregate data on this issue was, however, decidedly mixed and does not inspire total confidence in the likely success of a policy mix heavily reliant upon forcing down the wages of the young as a means of alleviating the current malaise. Some clues as to why the wages of young people do not clearly emerge as a determinant of their unemployment might be gleaned from the earlier work undertaken on the behaviour of the youth/adult earnings relative. This suggested that the relative is positively related to the age of young people in the labour market. To the extent that age is a reflection of productivity - and this itself may be bound up with the rather abstract notion of maturity as much as tangible skill levels - then "high" youth earnings need not be a reflection of disequilibrium.

This is not to deny that, *cet. par.*, employers would be expected to demand more of a factor whose price has fallen. Rather it is to ignore the possibility that the supply curves of youths with certain

skill characteristics may, just as those of adults, be fairly elastic over the relevant range. That there are other youths without work who would accept employment for less is itself irrelevant if these individuals do not appear to have the requisite abilities. In essence, the youth labour market itself may be segmented. But, furthermore, if the supply curves for all skill levels are ultimately elastic - and standard theoretical arguments regarding the value of leisure and the effect of unemployment compensation suggest this is likely - and the best technologies are not being exploited, then it may be that recession provides the spur to find ways of doing away with certain types of labour. If it is further assumed that the least skilled are the least complementary with advanced technology and that the young amongst them are the most vulnerable, by virtue of not being covered by the provisions of implicit contracts or the protective umbrella of trade union influence, then this could go some way to rationalising the finding, in Chapter 6 above, that relative youth earnings apparently move counter-cyclically.

If there is truth in the foregoing, the implications for possible government corrective actions are not entirely clear-cut. Attempts to upgrade the skills of those who have been displaced will not, of itself, increase the total number of job openings and may simply serve to redistribute a given level of unemployment. However, if the unemployed are those with the highest costs of skill acquisition then they should seek higher, not lower, returns for so doing than their more able contemporaries. Equity considerations would then need to enter into government subsidisation of their training. However, the problem would then be likely to arise of how

to prevent those who previously would have found privately financed training profitable from taking advantage of the subsidy also. It is hard in these circumstances to avoid the suspicion that labour-intensive reflation, perhaps involving a public works element, might be the more appropriate path to take. Whether schemes like the YTS are the correct way to achieve this is then, of course, the central, but as yet unanswered, question.

At this juncture it is prudent, however, to condition the above by reiterating some of the more negative aspects of the aggregate time-series work on earnings and unemployment. Thus, in practice, it is by no means unambiguous just what the movements in earnings - the usual empirical measure of pay - actually represent. Therefore any inferences drawn either from them in isolation or as regards their apparent relationship to unemployment movements need to be hedged with a good deal of caution. It seems extremely unlikely, for instance, that the earnings series which popularly get used in analysis consistently reflect both the true unit cost of labour and the net return to employment for those in work. Shifts in productivity, occupational structures, fringe benefits etc could all go towards rationalising seemingly errant earnings movements (c.f. Gregory et al. (1985)) and it would appear imperative that greater emphasis be placed on ascertaining precisely what the real wages of all labour, not simply youths, actually are. However, it should be noted that the form of wage and earnings exercises that are usually undertaken, at both aggregate and individual level, has recently come under attack for rather more methodological reasons also (Cameron (1985)).

The second problem is probably even more serious and potentially almost totally damning. It relates to the very high degree of instability uncovered in the time-series youth unemployment relationships under even quite minor changes of specification. At best this would reflect multicollinearity between the exogeneous influences considered. If the structure of the market remains unchanged then historically well fitting equations can be used to predict the future, irrespective of the behaviour of the individual coefficient values contained within them. However, the inability to apportion causality for any predicted unemployment to the separate exogeneous influences renders the knowledge of no value for policy purposes. Unfortunately, multicollinearity is a perennial, but almost incurable, affliction suffered by time-series analyses. One possible escape from it lies in the use of factor analysis (see Child (1970)). However, the likely temptation then to conduct regression analysis on the resulting components is problematic, as the ensuing factors would themselves have no economic interpretation and would again, therefore, have no meaning either for historical interpretation or for present policy.

However, as indicated above, all the evidence suggests that the structure of the youth labour market has not remained unchanged in recent years. Furthermore, the degree of coefficient instability earlier observed seems more likely to be the result of genuinely unstable relationships rather than statistical multicollinearity. Indeed, convincing evidence was uncovered to support this suspicion when the unemployment models were examined for evidence of structural breaks and these were confirmed to have occurred. There are two very

important implications of this. The first is that the results of research into post-war aggregate British youth unemployment which rely heavily on results reported from a limited number of simple regression models should probably be heavily discounted. Secondly, the limited number of years for which data is available on a consistent basis for youth unemployment and its potential determinants renders the available degrees of freedom a potential problem for more complex attempts at modelling the youth labour market than that undertaken here. It may in fact be preferable to abandon aggregate time series regression modelling of the first three post-war decades and to concentrate research resources into other aspects of the problems currently confronting young workers.

One thing that appears rather more certain from the more descriptive aspects of the work reported above is that the increase in youth unemployment has been reflected, at least in part, by a decline in the number of young people in paid employment. With scant evidence having been unearthed to suggest that the supply of their labour has been a significant determinant of the behaviour of their unemployment this does provide support, albeit mild, for the notion that the source of their problems lays in the demand side of the market. In fact, the examination of the post-war employment record of young people undertaken above suggests that the present crisis could well have been predicted, rather than the upsurge in their unemployment in the 1970's having taken many commentators by surprise. From the evidence contained in the self-completion, decennial Census of Population it appears that the aggregate

employment of young people began to fall some time in the 1960's. What is more, this source indicates that youths have in aggregate lost out in each post-war decade from reductions in their share of employment in the various sectors of the economy.

The principal, if not sole, beneficiaries of this reduction in youth intensity would appear to have been older females. This finding is of some interest. Thus, the inference must be that young people and mature females are substitutes. However, it is well-known (e.g. Robinson and Wallace (1984)) that more or less all of the increase in female employment has comprised part-timers and yet the aggregate unemployment regressions suggested that youths and older female part-time workers are complements. As neither methodological approach was rigorous enough to allow firm conclusions to be drawn, the findings must remain as interestingly divergent.

Given the undoubted explosion in part-time working, however, what must be noted is the apparent lack of interest shown by young people in this mode of employment. Neither, it must be said, has government seriously explored the possibility of inducting youths into the market via the medium of part-time work. Clearly this is a difficult area involving, amongst other things, the equity issues surrounding the potential substitution of young people for older females; but as it appears to be a working pattern that many employers prefer it does seem to merit greater attention than hitherto. However, the firm conclusions that can be drawn from the aggregate time-series analysis conducted here are actually few in number and one is left to enquire what further insights were provided by the examination of cross-sectional micro data on individuals.

Once again a leading finding is cautionary: snapshot analyses of the employment status of young people are sensitive to, inter alia, the stage of the economic cycle at which they are taken. This is hardly surprising, although many present their findings as though this were not the case. Care must therefore be taken in interpreting the results of such work. One may note in particular that as recession deepens the distribution of the unemployment burden amongst young people becomes markedly less random and it would appear possible to predict the characteristics of those who are the most susceptible as the economy turns down.

Two regularities emerged, however, across the years of study. Firstly, whatever the state of the national economy, regional disparities in performance are evident. Not surprisingly, youths in areas exhibiting the greatest labour market slack are more likely to be unemployed at a point in time than are those from more prosperous regions. As such the finding might be taken as just one more manifestation of the regional problem that is more or less common to all Western economies. Whether the level of resources devoted to its alleviation are sufficient is an ongoing, emotive issue which erupts most vehemently in discussions of pockets of multiple derivation. The data ^Sdi^Agregation available was not, however, detailed enough to paint more than a broad picture of inter-regional disadvantage. Secondly, as youths age they become less prone to unemployment. This need not necessarily, however, be a signal for concern. Thus, if younger workers are more prone to voluntary job-switching during their induction to the market, then, all else equal, the observed result will follow.

What might be the cause of rather more concern is the evidence produced on the differential impact of worsening depression. Thus whether or not the approximate doubling in the aggregate rate of unemployment amongst those aged under 25 between 1974 and 1978 could have been accurately predicted, some fairly firm evidence emerged to the effect that the brunt of it was borne by certain identifiable groups. In particular, those youths with little formal education, those who are non-white and those dwelling in council property were significantly more likely to be unemployed in the later year than others: a finding which was not mirrored in the more buoyant observation period. On the one hand, the results obtained are theoretically predictable - although by various, non-competing strands of reasoning. On the other hand, however, the size and significance of the effects uncovered raise questions of both equity and efficiency; particularly if the findings are the result of the operation of demand side influences.

In terms of equity, one might ask whether these outcomes of the operation of market forces are desirable. Individuals do not choose their colour and it is unlikely in many cases that the level of educational attainment is a choice variable. Admittedly, housing status is somewhat more problematic, although for a significant number of youths this is also likely to be predetermined. Likewise, efficiency may be impaired if government resources devoted to corrective labour market action are consumed by those who would have gained employment anyway. However, it must be said that, in those circumstances, intervention will overtly appear to have been more successful than otherwise - a charge somewhat similar to that laid

against the Job Centres from time to time, when it is argued that they predominantly place the most employable in order to maximise their "output". On both counts, therefore, one might make the case for the targeting of government assistance. Whether YTS currently does this by favouring those with the lowest educational attainment is a moot question, but, whatever the intention, in practice this seems likely to be only an approximate outcome. However, it must be remembered that the observation points used here represent two stages of the downswing of the economy, the situation may have changed again now it has apparently reached, and remained on, the valley floor.

A lot of ground has been covered on developments in the British youth labour market in the three decades from 1950; although clearly not all issues have been addressed. Both employment and unemployment data indicate that the situation has been deteriorating for some time. No theory of labour market behaviour specifically models that of young people and reliance has been placed on standard postulates in attempting to explain observed patterns. It may of course be that no special theory is called for in the case of youth. However, a good deal of instability has been uncovered in analysing their fortunes, ^{only} some of which, as in the case of the cross-sectional work, was ^{It behaves us to ensure} itself predictable, [^] therefore, [^] that any policy advice emanating from applied research represents sound findings reflecting the generality of results and not simply special cases.

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