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THE BRITISH LABOUR MARKET 1855 - 1939:

A QUANTITATIVE APPROACH

by

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Thesis submitted for the degree of Ph.D.

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December 1982.

ABSTRACT

This thesis examines the pattern and level of unemployment in the British Economy from 1855 to 1913. The structure of and variations in supply and demand for labour and unemployment are examined using data mostly from published sources. Various models are discussed and tested on the data using the standard techniques of regression analysis.

It is found that the pre first world war labour market can be described as free of major institutional and structural distortions, adjusting via a series of short run equilibria to a long run equilibrium. It is argued that the interwar labour market should be depicted as failing to adjust and suffering continuous excess supply of labour. In this context, the supply side role for the effect of unemployment benefits is limited and the maldistribution of unemployment across industries and regions is a consequence, rather than a cause of unemployment. It is argued that, under such conditions, there would have been scope for demand management policies and these would have involved both public spending and exchange rate policies.

CONTENTS

1. INTRODUCTION

2. A SURVEY OF THE LABOUR MARKET IN BRITAIN 1855-1913.

2.1. The Structure and Dynamics of the British Economy, 1855-1913.

2.2. The Record of Unemployment.

2.3. Wages and Wage Changes

2.4. Trades Unionism and Industrial Disputes.

2.5. The Development of Collective Bargaining.

2.6. Work and Welfare.

2.7. Equilibrium in the Labour Market.

3. THE LABOUR MARKET AND UNEMPLOYMENT, 1855 - 1913: AN EQUILIBRIUM APPROACH.

3.1. Equilibrium Unemployment and the Phillips Curve.

3.2. Natural Rate Models of Labour Supply.

3.3. Estimating Natural Rate Models.

3.4. Unemployment, Wage Change and Unemployment Benefits.

3.5. Estimating Unemployment Functions for Industrial Unions.

3.6. A Simultaneous Model of Labour Supply and Demand.

3.7. Rational Expectations and Causality.

4. ECONOMIC AND INSTITUTIONAL CHANGE IN THE AGE OF MASS UNEMPLOYMENT.

4.1. Growth, Structural Change and Economic Fluctuations.

4.2. The Genesis and Impact of Employment Exchanges and Unemployment Insurance.

4.3. The Dimensions of Unemployment.

4.4. Trades Unionism, Industrial Disputes and Collective Bargaining.

4.5. Wages, Prices and Living Standards between the Wars.

5. UNEMPLOYMENT, UNEMPLOYMENT BENEFITS AND THE MACROECONOMICS OF THE INTERWAR LABOUR MARKET.

5.1. The Debate over the Role of Unemployment Benefits.

5.2. Interwar Unemployment and Labour Market Disequilibrium.

5.3. A Model of Labour Market Disequilibrium for the Interwar Period.

5.4. Estimates for the Interwar Years.

5.5. Interwar Unemployment and the Keynesian Solution.

5. UNEMPLOYMENT, UNEMPLOYMENT BENEFITS AND THE MACROECONOMICS OF THE INTERWAR LABOUR MARKET (continued).

5.6. Exchange Rate Policy and Unemployment.

APPENDIX 5.1. A Note on Benjamin and Kochin's Counterfactual Calculations for Benefit Induced Unemployment.

APPENDIX 5.2. Economic Activity, the Trade Balance and the Marshall-Lerner Condition.

6. EMPLOYMENT, UNEMPLOYMENT AND BENEFITS: SOME FURTHER TESTS.

6.1. Employment Functions and the Interwar Period.

6.2. Output Constrained Employment Functions.

6.3. Unconstrained Functions for Output and Employment.

6.4. Labour Market Flows and Unemployment.

6.5. Quarterly Variations in Employment and the Insured Labour Force 1924-1939.

6.6. Quarterly Variations in Unemployment 1924-1939.

APPENDIX 6.1. Sources and Methods of Calculation of Price Series, 1920-1938.

7. STRUCTURAL ASPECTS OF UNEMPLOYMENT BETWEEN THE WARS.

7.1. Unemployment by Industry and Region.

7.2. Employment Growth by Industry and Region.

7.3. Time Series Variations in Industrial and Regional Unemployment Rates.

7.4. The Structure of Unemployment and Excess Supply of Labour.

7.5. The Structure of Unemployment and Economic Policy.

APPENDIX 7.1. Industrial Unemployment Equations 1923-38.

8. CONCLUSIONS.

BIBLIOGRAPHY.

ACKNOWLEDGEMENTS

I would like to thank colleagues at the University of Essex, particularly Raja Junankar, Mono Chatterji, Simon Price and Roy Bailey for helpful comments and advice on parts of this thesis which have, at various times, been the subject of discussions and seminars. I would also like to thank my supervisors, Alec Ford and Ken Wallis for their kindness and forbearance. I am grateful to Simon Price for assistance in some of the computing for Chapter 7. Finally, I owe a great debt to Sheila Ogden for her literary and typing skills in producing the finished draft.

CHAPTER 1

INTRODUCTION

The following chapters of this thesis study various aspects of the aggregate labour market in Britain from 1855 to 1939. They represent an effort to examine topics which are, or should be, important to economic historians using the tools of the applied economist. Despite the considerable advances made in quantitative economic history in the last few decades, this is an area which is in need of considerably more research. It is also an area in which the gap between historians and economists is still embarrassingly wide.

One of the points often put forward by leading "cliometricians" is that the old style economic history used theory and assumptions covertly and tested hypotheses only by implication. By contrast, their efforts have been devoted to framing historical questions in the context of explicit models devised from basic theory and testing formally using a variety of quantitative methods. (Fogel, 1967, McCloskey, 1978). As this approach has developed, it has not only provided new answers to old questions but also raised fresh questions which emerge as the result of empirical enquiry.

This approach has been increasingly applied in the context of British Economic history and some of the results of this enterprise have recently been brought together in two volumes by Floud and McCloskey (1981). It is notable, however, that recent surveys of the British labour market before 1914 find very little work of this nature to draw upon (Pollard, 1978, Baines, 1981, Hunt, 1981). There are two possible reasons for this. The first is that the new economic history has been based largely on neoclassical models, which are used as maintained hypotheses. This approach has lacked appeal to those interested in the labour market who have therefore been reluctant to apply them.

The second is that the existing historical literature has largely been aimed at answering questions which are, on the whole, different from those which would be asked by the applied economist. Labour history has emerged very largely as a branch of social history rather than of economic history. Its concerns have been with the development of particular institutional structures, the growth of ideas and the interpretation of various aspects of the labour movement in this context. Thus the growth of trades unionism, industrial conflict, the development of collective bargaining and the evolution of various aspects of social policy are all major topics of study. Though some outstanding work has been done in these areas, it has often stopped short of using economic analyses to tie the threads together.

There is, however, a considerable amount of quantitative work aimed at modelling features of the labour market but this has often been done by economists with a view to testing the robustness of models over long periods of time rather than modelling the distinctive characteristics of particular historical periods. This has, in consequence, remained largely outside the mainstream of historical literature. Furthermore there is beginning to emerge work on the labour market which is both historical and quantitative in nature and it seems likely that this trend will gather pace in the next few years.

The object of this thesis is to make a few tentative steps along this path and to perform some preliminary and exploratory work which it is intended will be continued in the future. Ideally work of this nature should display of an appreciation of primary and secondary material, an understanding of its wider historical implications together with the appropriate use of theory and quantitative methods. The exact blend depends on the type of question being addressed (as well as on the competence

or lack of it, of the researcher). The analysis presented here is partial and incomplete and falls short of the standards aspired to but it attempts to provide a general interpretation within which certain specific questions can be answered.

One important aspect is to survey and interpret the existing literature in an effort to bring some of the results of different kinds of historical work together and provide a back-ground to the empirical work. The period covered is a long span of more than 80 years and divides naturally into two parts: the period before 1914 and the inter-war years. It is traditional to view these periods separately and probably for good reason: the type and quality of information available is quite different between the two eras and so are the types of questions addressed in the literature. More fundamentally, there were important changes in the economic structure relating to the labour market which mark these periods out as distinct. The evaluation of the characteristics and nature of the periods under study is therefore important from the point of view of choosing the appropriate model or paradigm with which to work.

The major focus of the thesis is on explaining variations both in aggregate unemployment over time and across various groups at a point in time. This is one of the central questions of macroeconomic analysis and a wide range of theories and empirical models have been produced to explain various aspects of the issue. Many are variations on a particular theme but two major paradigms can be identified. The first is often termed the equilibrium approach and can be said to derive from the development of the microeconomic foundations of macroeconomics represented in the seminal volume of Phelps (ed.)(1970). The other is the disequilibrium or non-market clearing approach originating from Keynes General Theory and pioneered in its modern form by Barro and Grossman (1976).

Though these are often seen as competing theories, one is likely to be more appropriate than the other in different historical periods when economic structures and institutions would have been different. Furthermore, when used for prescriptive purposes or for evaluating policy counterfactuals, the models will often lead to different conclusions. This is illustrated in the case of the possible impact of unemployment benefits on the rate of unemployment. This issue, raised recently for the interwar period by Benjamin and Kochin (1979) is taken up at various points and it is argued that such effects differ, depending on whether an equilibrium or disequilibrium approach is taken. Similarly for other aspects of economic policy concerned with public spending or exchange rates, the outcome depends on the model used which must, therefore, be appropriate to the case.

In Chapter 2 a wide range of literature on the labour market from 1855 to 1913 is reviewed. In this there are three motives. First, to bring together a variety of material and to provide a picture of the main features of the labour market before 1913. Second, to interpret it and evaluate the economic implications of this literature as a guide to modelling fluctuations in unemployment and wage rates. Third, to closely scrutinize the available data which is subsequently used in estimation. Chapter 3 sets up a basic and relatively simple model of unemployment based on the neoclassical approach. This is subjected to a number of tests and various supplementary hypotheses are examined.

In Chapter 4 we turn the attention to the changes and developments in the economy and institutions relevant to the labour market occurring between the prewar decade and the 1920s. Some of the difference between the prewar and interwar periods were profound but were not always attributable solely to the effect of the war. Many of the changes, especially in

the expansion of the role of the state in such areas as social insurance and collective bargaining could be traced back to before the war. The war did, however, alter fundamental economic relationships, imposing a pressing need for adjustment and structural change. Yet, in many respects, economic institutions were ill adapted to meeting this challenge and, despite the expanded role of the state, policies of economic management were slow to emerge.

Thus things had changed but the implication of this did not become immediately clear and the interwar period saw the desperate search for theories within which new policies could be framed and was marked most notably by the appearance of the General Theory in 1936. In Chapter 5, it is argued that a Keynesian approach is the appropriate paradigm for the interwar period and several important policy issues are re-examined in this context. This includes an examination of the possible causal links between unemployment benefit provisions and unemployment in a Keynesian framework as well as the more traditional policy issues: public spending and the exchange rate.

Chapter 6 is devoted to further examining the underlying structure and determinants of employment and unemployment. The issue of the relationship between output, employment and real wages originally highlighted in the debate between Keynes (1939) and Dunlop (1938) is re-examined at the industry level. In order to achieve further insight into the operation of the labour market, the rates of flow of workers between employment and unemployment and into and out of the labour force are examined. Further time series models are tested, using quarterly data not previously used in empirical work. In all this, the potential impact of unemployment benefits is kept firmly in the picture

as is the issue of what appropriate policies for lowering unemployment might have been.

One of the most striking features of interwar unemployment was the diversity in the experience among different industries and regions. To many observers, this is a central feature in the diagnosis of the causes of unemployment which carries important policy implications. Fundamental to this is the relationship between the regional and industrial composition of both unemployment and the growth of employment. Whether regional and industrial maldistribution leads to structural unemployment depends both on the overall level of activity and the degree of labour mobility. Chapter 7 examines these issues afresh and attempts to relate them back to some of the questions raised in earlier chapters.

Finally, some of the conclusions which emerge in the course of the analysis are drawn together in Chapter 8. Though many questions remain unanswered and the answers to others remain in doubt, it is argued that some insights can be drawn at this stage. In many areas, however, further enquiry and more detailed analysis is still required before the various features of the labour market can be fully understood and placed in a consistent framework.

CHAPTER 2

A SURVEY OF THE LABOUR MARKET IN BRITAIN 1850 - 1913

2.1 The Structure and Dynamics of the British Economy 1855 - 1913

By the middle of the nineteenth century Britain had become the world's first truly industrialised economy and, in the 60 years after 1850, the economy developed along a path which had been largely established by the profound changes of the previous 60 years. This development had far-reaching effects on the labour market and, in particular, for the institution of wage labour upon which growth and prosperity was largely based. The rise of factory industry, the growth of urbanisation , specialisation of skills and occupations produced an increased dependency of workers and firms upon each other which focused on the relationship between them. In the 1851 census the urban population for the first time exceeded the rural population and 43% of the occupied population found their employment in industry, compared with 22% in agriculture. From this time the numbers in agriculture fell not only relatively but absolutely. Proportional expansion was concentrated in extractive and service industries such that, although the agricultural proportion fell to 8.3% by 1911, the manufacturing proportion remained about a third while industry as a whole rose to 46.4% (Deane and Cole, 1962, p. 142).

This distribution reflects the pattern of domestic demand in an economy with historically high income levels and the pattern of international specialisation which resulted from becoming the "workshop of the world". This also finds expression in the fact that trade and transport category occupied some 20% of the working population. While domestic consumption averaged about 85% of GNP from 1870 onwards,

exports and domestic capital formation accounted for approximately a third. The latter consisted of a high proportion of industrial output and gave rise to the dominance of the staple industries which are an important characteristic of the period.

The three broad sectors of mining and quarrying, textiles and clothing and engineering and metal manufactures are estimated to have accounted for more than 22% of national income in 1907. Within these groups some 70% of textiles, 30% of iron and steel and 30% of coal output was exported. The specialisation which this implies was reflected regionally as well as industrially. Cotton textiles focused on Lancashire, coal on South Wales and Northumberland and Durham, shipbuilding on the Tyne and Clyde, iron and steel in Cleveland and Lincolnshire. Other industries which were based more on the home market were more evenly distributed - the best example being the building industry which, although reflecting the pattern of economic activity in different regions, was widely dispersed and the food processing and service industries of which the location reflected more the conditions of demand than of supply.

This distinctive structure which characterises the economy conditioned the pattern of economic fluctuations. According to Rostow, it was about the middle of the century when the minor cycles generated by agricultural fluctuations and an inventory cycle in textiles gave way to the deeper rhythm of cycles dominated by long term investment either at home or abroad. (Rostow, 1948, p. 39-50). There has been considerable interest in long waves in prices and activity of some 50 years in duration and, more recently, a substantial literature has

grown up on long swings, with a periodicity of some 20 years[1]. But the most prominent systematic pattern seen in the raw time series is the 7 - 10 year fluctuations sometimes known as the Juglar cycle. Table 2.1 lists the cyclical peaks and troughs in real GNP distinguished by Aldcroft and Fearon.

Table 2.1

The Trade Cycle 1850 - 1913

Peak	Trough
1856	1858
1859	1862
1865	1869
1874	1879
1883	1886
1890	1894
1901	1904
1907	1909
1913	

Source: Aldcroft and Fearon (1972, p. 9)

There is a wide measure of agreement about the dating of peaks and troughs which reflects both the distinctiveness of the cycle and the strong synchronisation of the various time series used as indicators. Comparing the pattern of peaks and troughs in Table 1.1 with the pattern of industrial production, for example, gives the same

[1] The twenty year swings have been examined most prominently by Brinley Thomas (1954, 1973) in the context of the "Atlantic Economy" hypothesis. The effects on economic activity come largely through the alternation of home and overseas investment which gave rise to offsetting swings in domestic investment & exports. The implication of this for shorter cycles in activity has been widely discussed (Rostow, 1948, Cairncross 1952, Matthews, 1959, Ford, 1965, 1969, 1971)

number of cycles only differing in turning points by one year at the most. (Beveridge, 1944, p. 28, Rostow, 1948, p. 33, Aldcroft and Fearon, 1972, p. 12).

While each cycle has its distinctive features, leading indicators tend to follow similar patterns over the course of each cycle, leaving a strong impression that similar forces operating through a stable mechanism were responsible for each. Most of the postwar literature is Keynesian in flavour and concentrates on the most volatile components of expenditure as the proximate source of fluctuations. Ford has concluded that "the immediate cause of fluctuations in British money incomes was fluctuations in export values aided or impeded by fluctuations in home investment"(1965, p. 94-5). As regards timing, both exports and domestic investment appear to have led or coincided with GNP at peaks and troughs in most cycles but exports were more closely associated with GNP than investment. If these were the proximate causes, then the true causes depend on the determinants of exports and investment, though these are often designated "autonomous expenditures".

If exports were sensitive to relative prices, then they might, in part, be determined endogenously but a more important contention is that they were largely determined by fluctuations in British foreign lending which displays cyclical fluctuations leading exports at peaks by one to two years (Ford, 1963, 1965, 1969). This suggests that exports were, in part, determined at home, though the lack of correspondence between exports and lending when disaggregated, suggests that both may have been jointly determined by domestic and external forces. Similarly, home investment has often been regarded as depending

largely on realised profits, sometimes construed as an indicator of expected profits (Tinbergen, 1951, Saul, 1969, p. 41, Church, 1975, p.40). Like many other variables, profits are strongly procyclical and the share of profits in total income shows a strong tendency to move in the same direction as total income. However, the level or share of profits has no more claim to be a truly exogenous variable than any other.

An alternative view put forward is that cycles were essentially monetary in origin. Like the other variables, the money stock moves with the cycle and a number of attempts have been made to distinguish between the money hypothesis and the spending hypothesis by the econometric estimation of reduced form multipliers[1] (Barret and Walters, 1966, Walters, 1969, Sheppard, 1971). In levels, both autonomous spending and the money stock contribute to the explanation of income and consumption over the period 1881 - 1914. Autonomous spending generally explains more of the variance than the money stock, though there is a high correlation between them as well as with income. But when first differences are used to abstract from the common trends, autonomous spending appears to be considerably more powerful (Sheppard, 1971, Tables 5.2 - 5.4, pp. 76 - 83).

It is likely that the money stock is even more of an endogenous variable than autonomous expenditure and the evidence from tests for the direction of causality is as yet inconclusive (Mills and Wood, 1978, Huffman and Lothian, 1980). There are good reasons to doubt the independence of the money supply since there is a great deal of evidence

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[1] This technique of running a "horse race" between the autonomous spending and monetary hypotheses derives from Friedman and Meiselman (1963).

that the monetary authorities essentially followed the advice of Bagehot in adopting an accommodating role which may account, in part, for the diminution of monetary crises, particularly after 1870 (Hicks, 1974) A more contentious argument recently put forward is that the theory of the monetary approach to the balance of payments is appropriate, in this period, so that even if the authorities had been willing to pursue an independent policy, excess demand or supply of money balances would have been brought into equilibrium by international gold flows. (McCloskey and Zecher, 1976).

Even if endogeneity is ignored, monetary based macro models, which admittedly include more recent periods in the data set, fit rather badly for the thirty years before 1914 and exhibit implausibly long adjustment speeds (Jonson, 1976, Smith, 1977). The most complete macro model estimated for the prewar economy remains that of Tinbergen (1951). It is too complex to describe in detail[1] but the most important characteristic of the model was that, in both goods and money markets, "demand is almost everywhere [price] inelastic" (1951, p. 94). This suggests that expenditure decisions will generally be a more important source of fluctuations than supply factors , including money supply. On the income side, a key feature of the model is the distinction between the wage bill and non-labour income. Spending out of the former is devoted almost wholly to consumption while the latter is divided between consumption and investment. An interesting feature is that Tinbergen eventually closed the model to make all variables dependant on other endogenous variables, current or lagged. This gave rise to a second order difference equation in non-labour income which was capable of generating endogenously cycles similar in duration to those actually observed.

[1] A useful survey of the model is given by Nerlove (1965).

These macro models have inevitably paid scant attention to the labour market inspite of the emphasis placed on it in theoretical models of macroeconomic adjustment. Thus in Smith's model, the aggregate wage bill was related directly to the money supply and in Johnson's model, employment and wages were not considered directly at all. While hypotheses about the labour market may underlie the equations for the adjustment of prices and output, these are not made explicit. Though these models shed light on the proximate causes of fluctuations in employment, this is not the main focus of attention and the labour market mechanism is subsumed or specified in an ad hoc manner.

The major exception to this is in the model of Tinbergen who experimented with a variety of equations. Employment was simply demand determined but a variety of different variables were tried in the equation determining the wage level. Among these were the cost of living index, the relative price of consumption and investment goods, cumulative past employment and the level of union membership. All these were rejected, however, in favour of the price of coal as the sole explanatory variable. In some respects Tinbergen's work foreshadows that of the later investigations of Phillips (1958), Lipsey (1960) and subsequent writers. This relationship is regarded as fundamental to the adjustment of the macro economy and the task of Chapter 3 is therefore to develop and reinterpret this relation.

2.2 The Record of Unemployment

Unemployment is a feature of the labour market which normally appears under capitalism and is associated with the establishment of factory industries and the development of urbanisation. Though the distinction between this and the under employment of pre-industrial economies is rather arbitrary, it is the former, reflecting the cyclical fluctuations of the industrial sector which is of primary concern here. Unemployment only became a topic of major concern to contemporaries in the 1880s and the term itself did not come into widespread use until the 1890s[1]. This interest was rather different from that which might be taken today since it focused on the conditions of poverty and was spurred on by discontent among certain sections of the workforce. It concentrated therefore largely on the problem of casual labour particularly in London's dockland which might be regarded as a rather underdeveloped sector of the economy (Tomlinson, (1981) Ch. 1). These aspects are discussed in more detail in section 2.6.

Before the figures generated by the National Insurance Act of 1911 and subsequent Acts became available, the only source of continuous information is that compiled by the Board of Trade from the returns of Trade Unions who paid out of work benefits to their members. Though the enumeration of the unemployed in these returns is consistent with that

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[1] Thus an enquiry set up in the early 1890s was designated the "Committee on Distress from Want of Employment". However it has been noted that the word "unemployment" first appeared in the Oxford English Dictionary in 1888 and the word "unemployed" in 1882 (Creedy, 1981, p.2).

used in later official statistics, it has been described as a "pitifully small" sample (Feinstein, 1972, p. 225). Not only is it small relative to the aggregate labour force, less than 1% in 1870 reaching 3½% by 1910, its composition reflects the trade union membership from which it was drawn. Thus the original index was simply obtained by weighting the unemployment percentage for each union by the proportion of its membership in the total of reporting unions. Some idea of the composition can be obtained from the following table

Table 2.2

Percentage Weights of Reporting Trade Union Membership by Industrial Groups

	1894	1908	1913
Building	21	9.4	8.3
Woodworking & Furnishing		5.4	5.1
Coal Mining	19	19.5	18.5
Engineering	46	25.2	32.2
Shipbuilding		9.0	
Other Metal Trades		4.9	7.1
Printing and Bookbinding	10	8.7	7.1
Paper	-	-	
Textiles	3	14.5	14.1
Clothing	-	-	6.2
Miscellaneous	1	3.4	1.4

Source: Beveridge (1930), Table IV, p. 20 and 425.

The dominance in the returns of engineering, shipbuilding and metals was even greater in the earlier years comprising about threequarters in the 1860s and not falling below half until the 1890s. Given that the average unemployment percentage for this group is nearly double that for the rest, the Board of Trade reweighted the index giving them a weight of a half throughout and the series given by Feinstein which is used subsequently,adopts this index until 1880 and the crude index thereafter.

The extent to which the index reflects the true unemployment rate in those industries to which it applies is not clear. The average rate for the index as a whole from 1861 to 1913 is 4.45 per cent and it shows no long run trend. Over this period the average rates across the main industrial groups classified by the Board of Trade is shown in Table 2.3

Table 2.3

Average Unemployment Percentage for Main Industrial Groups 1861 - 1913

Engineering, Shipbuilding and Metals	6.0
Building	3.8
Woodworking and Furnishing	3.3*
Printing and Bookbinding	3.7
Other Trades	1.9*

* 1867 - 1913
Source: Board of Trade, British and Foreign Trade & Industrial Conditions, 1904.

Though the level of unemployment of the metal using trades is exceptionally high and that of other trades exceptionally low, this is largely accounted for by the differences in the range of variation. This range might be too small for all groups if unemployed unionists tended

to let their membership lapse at times of high unemployment and the evidence of procyclical movements in membership might be used to support this.

Though there is little evidence of it, if unionists were able to command wage rates higher than non-unionists, their unemployment rates might have been higher though, if restrictions to entry were imposed, this would operate in the opposite direction. One possibility to be investigated in greater detail is whether the existence of out-of-work benefit schemes, a characteristic of all reporting unions, directly induced higher unemployment rates among them. There is also a problem of inferring unemployment for an industry as a whole from unemployment among unionists since these would be largely craft or skilled workers. Even if unionism itself did not induce distortions, it might be expected that unemployment would be higher in less skilled groups, if only because of greater variability of employment since employers might be more reluctant to lay off skilled workers in the face of temporary variations in demand.

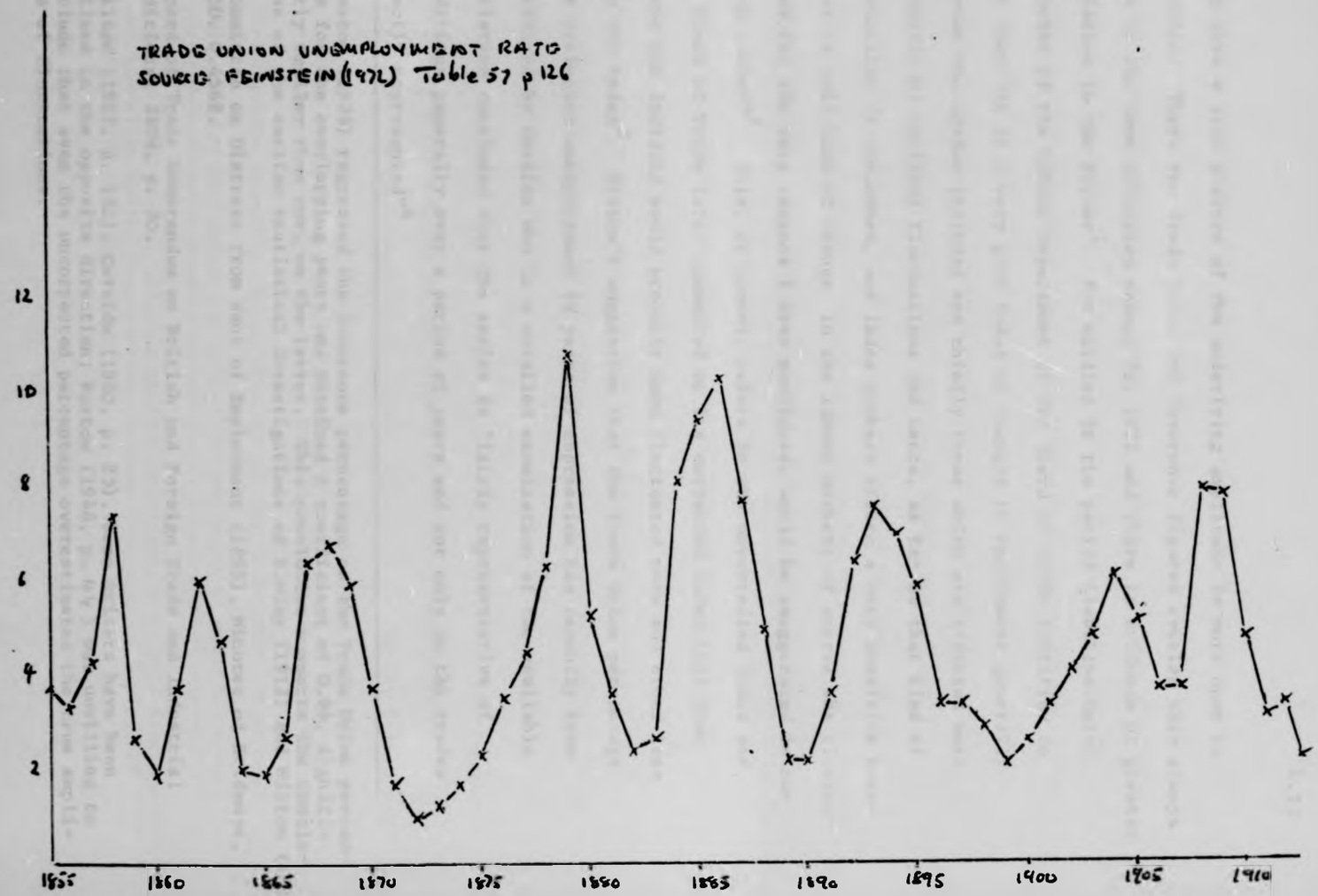
Even if the indices were taken as adequate for the industries to which they relate the problems of weighting are formidable. A number of industries are not represented at all, the weights of the included industries are arbitrary and change arbitrarily over time and the geographical distribution is misrepresented. An attempt to reweight the index for 1893 according to the industrial classification in the census reduced the percentage from 7.0% to 4.2% (Committee on Distress from Want of Employment Third Report (1895, p. 51) and this led some observers to the conclusion that, on average, the figure was too high. Beveridge thought that "It is best to give up all attempts to use the Trade Union returns as an index of the actual volume of employment in the whole of industry" (1930, p. 21).

Evidence from the figures produced by the National Insurance system from 1912 onwards, however, shows that where the two series overlap, from 1912 to 1926, they are not seriously out of line interms of overall levels. Excluding the year 1919, the average over thirteen years is 6.4% for the Trade Union figures compared with 7.1% for the Insurance series (Booth and Glynn, 1975, Appendix 1) and Beveridge later concluded that, in this light, the Trade union average of 4.8% between 1883 and 1913 should be raised to about 6% (1944, p. 72). However, this comparison may be affected to some extent by the peculiarites imposed by the structure of interwar unemployment and the National Insurance scheme itself and this is discussed in more detail in Chapter 4.

It is possible to conclude that, given the importance in the pre-war labour market , of casual and unskilled groups with irregular employment and high turnover rates, that average unemployment was very much higher than the figures indicate. Thus many observers have concluded with Hobsbawm (1964, p. 129) that "At the very least we must assume a much greater volume of constant, if concealed, unemployment than the indices show". But even if no accurate impression of overall levels can be gained, it is unlikely as far as the industrial sector is concerned, that the figures conceal a secular trend in unemployment though such an intensification of the problem in the 1880s is sometimes claimed (Burgess, 1980, p. 49)

While there remain doubts about the overall level of unemployment, the year to year fluctuations can be approached with more confidence. Figure 2.1 plots the unemployment percentage showing the distinctive pattern ofeight full cycles with unemployment ranging between extreme values of over 10% and less that 1%. These fluctuations conform closely in timing with other evidence on the labour market although the extent to which

Fig 2·1


TRADE UNION UNEMPLOYMENT RATE
SOURCE FEINSTEIN (1972) Table 57 p 126
12
10
8
6
4
2
1855
1860
1865
1870
1875
1880
1885
1890
1895
1900
1905
1910

they give a true picture of the underlying amplitude is more open to question. Where the Trade Union and Insurance figures overlap they always move in the same direction except for 1922 and there is evidence of greater variation in the former[1]. For earlier in the period Llewellyn-Smith, Director of the Labour Department of the Board of Trade testified in 1895 that "it is a very good index of changes in employment generally because the trades included are chiefly those which are affected most violently by cyclical fluctuations and hence, as far as that kind of fluctuation is concerned, our index numbers afford a very sensitive barometer of this kind of change in the labour market; of course the fluctuations for the very reasons I have mentioned, would be exaggerated in our index number"[2] This, of course, refers to the uncorrected index and the Board of Trade later commented on its corrected index that some groups not included would probably have fluctuated more and other less than the index[3]. Hilton's suggestion that the Trade Union percentage over estimated unemployment in years of depression has recently been criticised by Garside who in a detailed examination of the available statistics concluded that the series is "fairly representative of conditions generally over a period of years and not only in the trades directly represented"[4]

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[1] Easton (1978) regressed the Insurance percentage on the Trade Union percentage for the overlapping years and obtained a coefficient of 0.89, significantly smaller than one, on the latter. This conclusion supports the conclusions of the earlier statistical investigations of Bowley (1912) and Hilton (1922).

[2] Committee on Distress from Want of Employment (1895), Minutes of Evidence, p. 50. Q.4562.

[3] Board of Trade Memorandum on British and Foreign Trade and Industrial Conditions, 1904, p. 90.

[4] Hilton (1922, p. 182), Garside (1980, p. 23). Some writers have been inclined in the opposite direction; Rostow (1948, p. 44) was unwilling to conclude that even the uncorrected percentage overestimated the true amplitude of fluctuations.

The reason for divergence of opinion is the differences in amplitude of fluctuations between broad groups of industries and, as before, the metals group stands out. This has led some observers to argue for making a distinction between the "fluctuating" and the relatively stable industries[1]. The unemployment rates in four broad industrial groups are plotted in Figure 2.2 and that of the metals group is clearly more volatile than the rest although this feature largely disappears after 1895. But while each group has its distinctive pattern, the broad cyclical pattern is common to all. The cycles of 1873-1882, 1882-1891 and 1906-1913 all reveal a hierarchy of amplitudes rather than a dichotomy with the widest fluctuations in the metals group followed by building, furniture and furnishing and lastly, printing. Moreover, the pattern and timing of unemployment in these cycles is closely similar between groups, all peaks falling in the same year. In the remaining cycles patterns diverge somewhat but there is still a strong correspondence between the three less fluctuating series.

This pattern can be readily explained with reference to fluctuations in broad sectors of the economy which are reflected quite accurately in the unemployment series. The metal industries have often been taken as indicative of victims of the trade cycle because of their concentration in exports and their characteristic as largely "instrumental trades". Hence this sector can be regarded as an indicator for the industries which bore the brunt of cyclical expan-

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1 Beveridge (1944) p. 293. For an earlier reference to this distinction, see Llewellyn Smith, Committee on Distress from Want of Employment (1895, p. 47. Q. 4535-7).

Fig 2.2

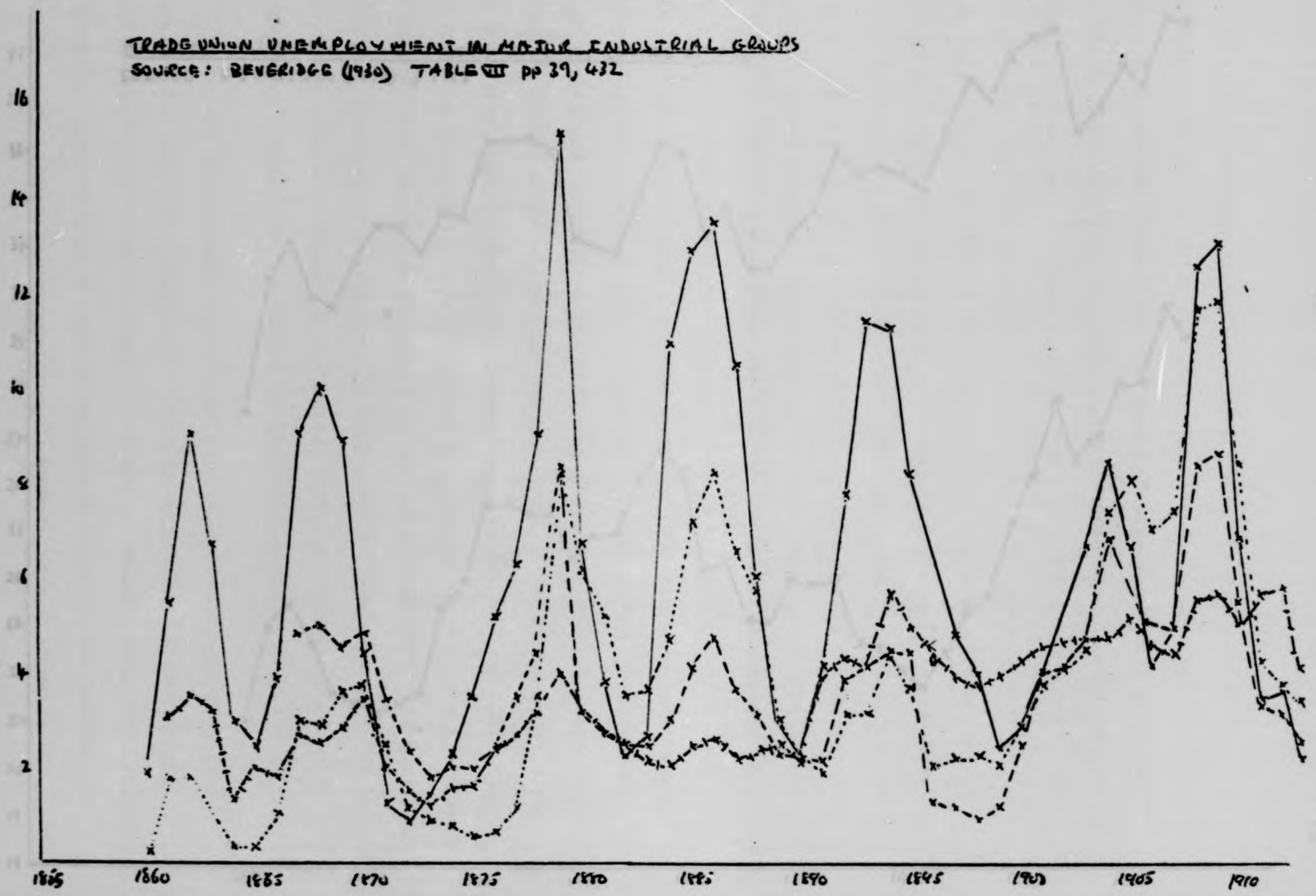
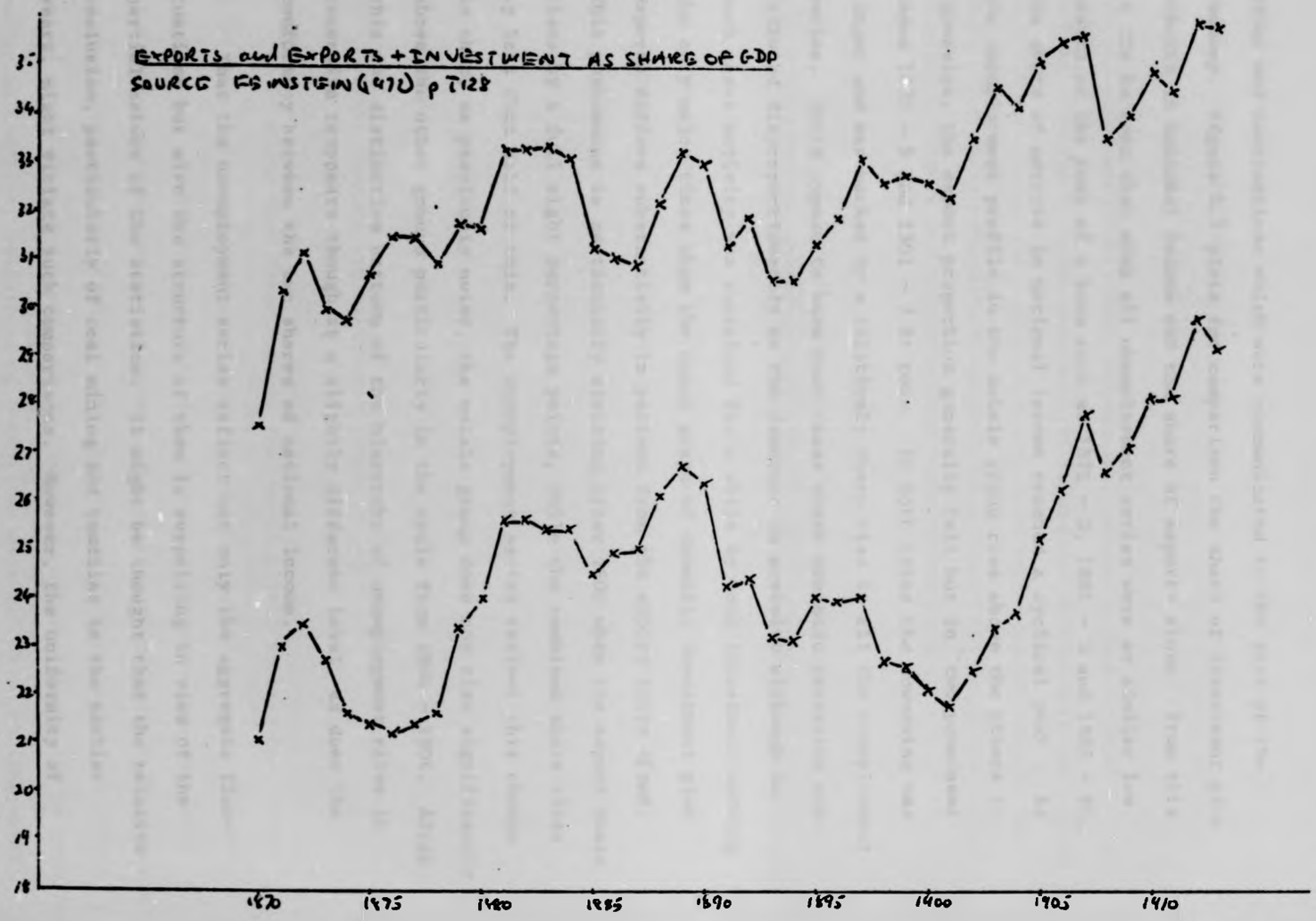

TRADE UNION UNEMPLOYMENT IN MAJOR INDUSTRIAL GROUPS
SOURCE: BEVERIDGE (1930) TABLE III pp 39, 432
16
14
12
10
8
6
4
2
1855
1860
1865
1870
1875
1880
1885
1890
1895
1900
1905
1910

Fig 2.3


EXPORTS and EXPORTS + INVESTMENT AS SHARES OF GDP
SOURCE FS INSTEIN (1972) p T128
35
34
33
32
31
30
29
28
27
26
25
24
23
22
21
20
19
18
1870
1875
1880
1885
1890
1895
1900
1905
1910

sions and contractions which were communicated to the rest of the economy. Figure 2.3 plots for comparison the share of investment plus exports in national income and the share of exports alone. From this it can be seen that when all unemployment series were at similar low levels at the peak of a boom such as 1871 - 3, 1881 - 3 and 1888 - 90, the share of exports in national income reached a cyclical peak . As the unemployment profile in the metals group rose above the others in recession, the export proportion generally fell but in two prominent cases 1875 - 9 and 1901 - 7 it rose. In both cases the downswing was longer and was marked by a relatively sharp rise in all the unemployment series. These appear to have been cases where domestic recession contributed disproportionately to the downturn in activity although in both cases activity was sustained for a while by home investment marking the only major times when the upper graph of domestic investment plus exports differs substantially in pattern from the export share alone. This phenomenon is particularly striking after 1900 when the export share rises by a full eight percentage points, while the combined share rises by less than half of this. The unemployment series reflect this change in that, as previously noted, the metals group does not rise significantly above the other groups particularly in the cycle from 1904 - 1906. After this the distinctive pattern of the hierarchy of unemployment rates in recession reappears though at a slightly different level, as does the conformity between the two shares of national income.

That the unemployment series reflect not only the aggregate fluctuations but also the structure of them is surprising in view of the partial nature of the statistics. It might be thought that the relative exclusion, particularly of coal mining and textiles in the earlier years, might vitiate such comparisons. However, the uniformity of

cyclical movements, particularly of different classes of exports is much closer in the years before 1900 and, hence, the omission of key sectors is not too misleading.

In their enquiry of 1909, Chapman and Hallsworth investigated how far a change in total man-hours of labour was divided between changes in hours per worker and number of workers employed from one year to the next. From their data the change in hours as a percentage of the change in total man hours was calculated for certain industries:

Table .4

Percentage of change in total Manhours met by change in hours per worker

Trade	Nov 1906 - Nov 1907	Nov 1907 - Nov 1908
Iron and Steel	32	29
Cotton	36	65
Woollen	43	71
Worsted	59	68
Hosiery	44	7
Boots and Shoes	79	-
Glass	6	8

Source: Chapman and Hallsworth (1909) p. 49-50.

It is clear from these figures that particularly in textiles, short term variations in activity were met largely by changes in hours. Chapman & Hallsworth suggested from this data that a shrinkage of the wage bill of 8.2% would be met by the dismissal of 4.4% of workers and a 3.8% increase in short time working (1909, p. 53). Rowe found that variations in shifts worked per week at the mines were equivalent to between 2% and 17% of unemployment. In textiles, variations equivalent to 5-10% of unemployment were absorbed by short time working

while, in railways, shipbuilding and engineering, the combination of short time and overtime was used (Rowe, 1928, pp. 60-63).

There is also evidence that the incidence of unemployment fell disproportionately among a small proportion of workers even amongst union members. From Union records Beveridge found that among shipwrights, over the period 1894-1903, between 20% and 40% of the membership became unemployed in any year and similarly for members of the Associated Society of Engineers. It should be remembered that these were among the most fluctuating trades but even in these, most unemployment tended to be concentrated among a small minority (1930, p. 70, 73). Of 2268 members of the London Society of Compositors who drew out of work benefit from the union in 1904, 74% claimed again in 1905, 62% in 1906 and 44% in 1907 and 8.6% of the membership in all four years[1].

There is little evidence on individual durations of unemployment though the results of enquiries in Manchester in 1904 and 1906 suggest about half of the unemployed had durations of less than three months (Chapman, 1908, p. 332.) It seems likely that those experiencing repeated spells would tend to have longer durations per spell of unemployment. These would often be the less efficient or older workers and, among A.S.E. members in 1895, average days lost increased sharply above age 45 to double that of younger age groups (Chapman and Hallsworth, 1909, p. 77). Some additional evidence of the distribution of unemployment across age groups can be obtained from the age distribution of applicants to local distress committees in London for relief under the Unemployed Workman Act of 1905. The number of applicants is expressed

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[1] A similar pattern was found among members of the Consolidated Society of Journeyman Bookbinders: of 572 signing on for out of work pay in 1903, 66% also signed in 1904, 49% in 1905 and 52% in 1906 with 12% of members signing in each year.

as a ratio of the relevant total population but, since this would give only a small fraction, the rate for each age group is expressed as a percentage of the 35-44 group.

Table 1.5

Age Distribution of Applicants to Distress Committees

(1)	(2)	(3)	(4)	(5)
Age Group	London	London	Manchester	Manchester
	1906/7	1910/11	1907/8	(Census) 1909
15-19	12.4	23.5	119.5	71.1*
20-24	54.8	51.0		
25-34	83.0	78.8	108.7	81.5
35-44	100.0	100.0	100.0	100.0
45-54	91.9	90.3	86.8	85.3
55-54	64.4	59.8	-	97.8

Sources: Cols. (2), (3) Beveridge (1930) Table XIX, p. 119 and 440; cols. (4), (5) Chapman and Hallsworth (1909) p. 74, 75. The final column is for the Manchester census of unemployment of 1909. The asterisk indicates that the age group in the census was 14-24.

This evidence gives rather conflicting results. For London there is a sharply rising profile of unemployment up to age 35-44 which is absent in Manchester. It is likely that the London figures underestimate and the Manchester figures overestimate the unemployment amongst those under 25 relative to the group aged 35-44 and that the incidence of unemployment was smaller among the younger age groups[1]. The distress

[1] The two sets of figures probably reflect the extremely different labour market structures and the national average would probably fall in between. Furthermore the Manchester figures may be biased by the use of Lancashire's population as the denominator.

committee applicants, however, reflect a very small portion of the industrial population and mainly those who were chronically unemployed. Most would have had repeated spells of unemployment and employment[1].

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[1] In Manchester and Salford in 1908, 40% of applicants had held their previous employment for less than a year (Chapman and Hallsworth (1909, p. 81).

2.3 Wages and Wage Changes

Several indices of average money wages are available for the second half of the nineteenth century, most of which are based on the pioneering work of Bowley and Wood (1898-1906). Two indices given by Feinstein are given in Figure 2.4. One is an index of average weekly wage rates which is Wood's index for "workmen of unchanged grade" working a full week and is an unweighted index of constituent standard wage rates (Wood, 1909, p. 102-3). This "does not reflect changes in earnings due to such factors as changes in the composition of the labour force ..., changes in unemployment or changes in the earnings of piece workers and others paid by result which are due to changes in output"(Feinstein, 1972 , T.140-1). The alternative earnings series is essentially that compiled by Bowley (1937, p. 30) which is a weighted index taking into account compositional changes and variations in hours and employment. While these series are, in some respects, incomplete, they have acquired considerable authority.

The wage rate series indicates an overall rise in the average wage from about 23 shillings per week in 1855, to 37 shillings in 1913 and the earnings series gives a rather more rapid rise due largely to the increasing weight of high wage industries. The pattern displayed by these series is of weak cyclical movements superimposed on rapid advance to a major peak in the early 1870s, decline and recovery to the mid 1890s and then fluctuations about a slowly rising trend. When this profile is compared with that of selected price indices given in Figure 2.5., it is clear that times of rising nominal wages were not always times of rising real wages. Indeed the period during which nominal wages rose relatively slowly, from the mid 1870s to the mid 1890s was the time when real wages rose most rapidly. Though the precise magnitudes depend on the price index used,

Fig 2.4

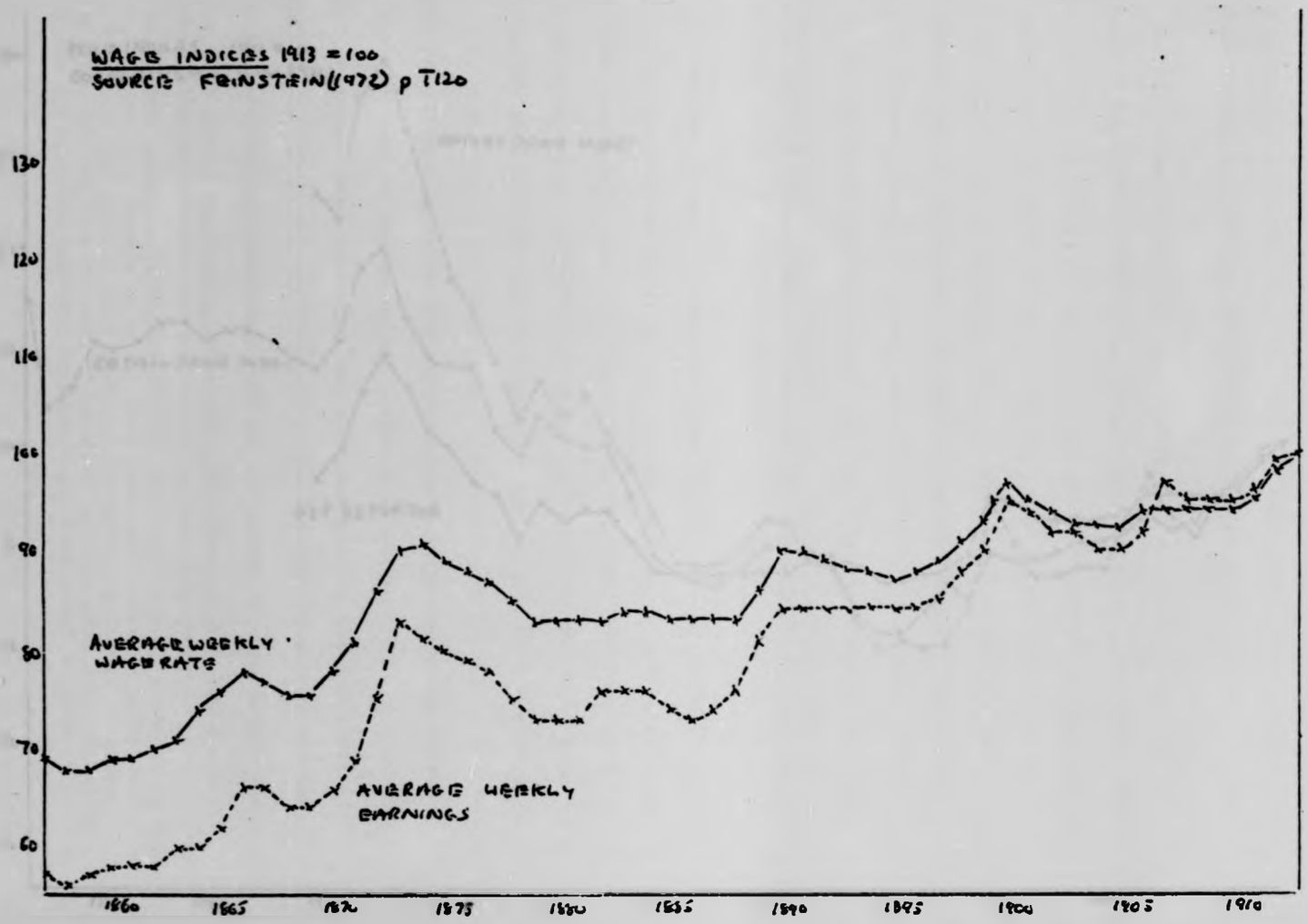
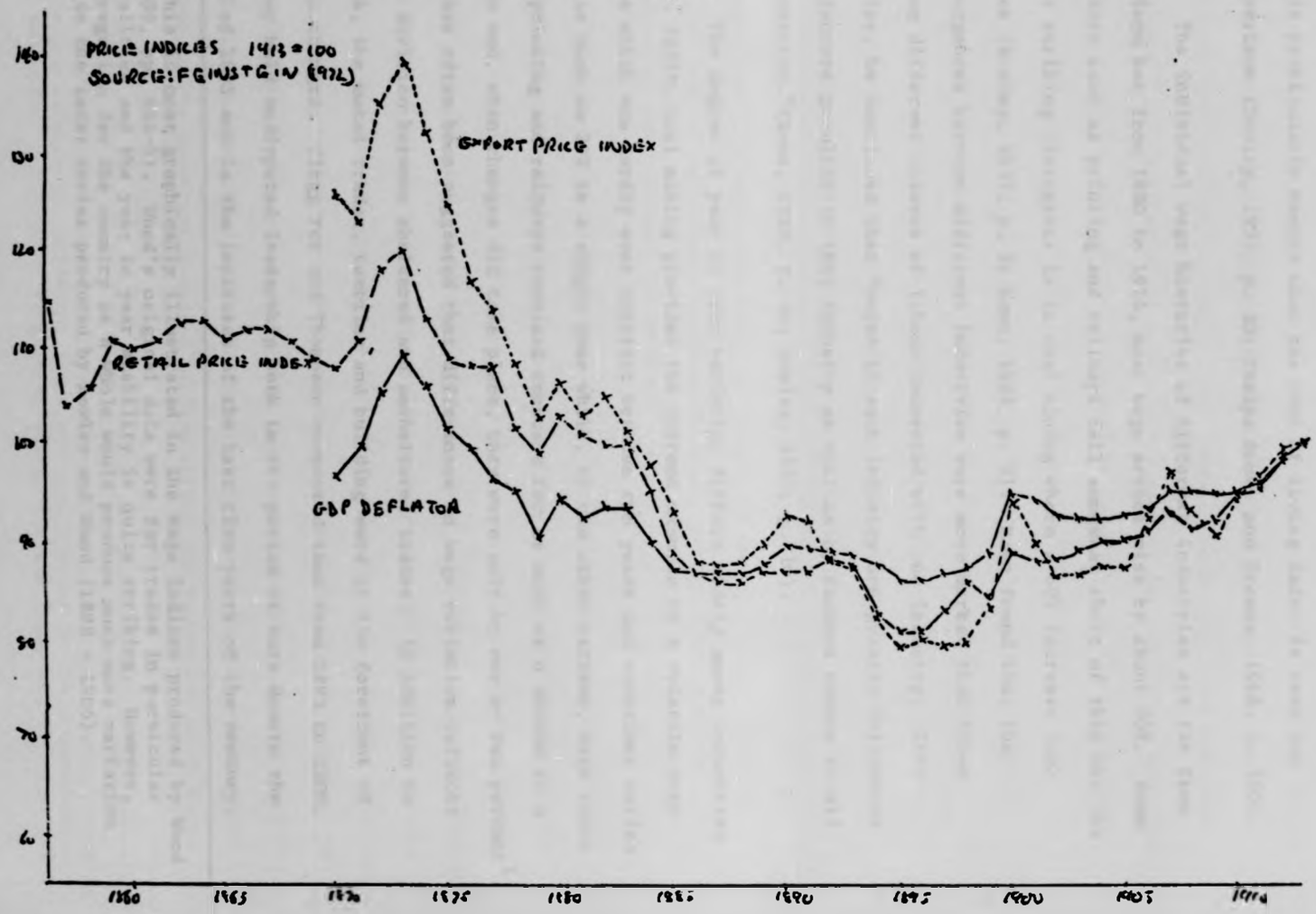

WAGE INDICES 1913 = 100
SOURCE FEINSTEIN (1972) p T120
130
120
110
100
90
80
70
60
AVERAGE WEEKLY WAGE RATE
AVERAGE WEEKLY EARNINGS
1860
1865
1870
1875
1880
1885
1890
1895
1900
1905
1910

Fig 2.5


PRICE INDICES 1913 = 100
SOURCE: F GINSTGIN (1972)
EXPORT PRICE INDEX
RETAIL PRICE INDEX
GDP DEFLATOR
140
130
120
110
100
90
80
70
60
1860
1865
1870
1875
1880
1885
1890
1895
1900
1905
1910

it is particularly marked when the cost of living index is used for comparison (Bowley, 1937, p. 30; Phelps Brown and Browne, 1968, p. 160).

The individual wage histories of different industries are far from uniform but from 1880 to 1914, most wage series rise by about 20%. Some sectors such as printing and railways fell somewhat short of this but the most striking divergence is in coal mining where a 60% increase took place (Bowley, 1937, p. 8; Rowe, 1928, p. 9). Rowe found that the divergences between different industries were more marked than those among different classes of labour connected with one industry. Like Bowley, he concluded that "wages in each industry are greatly influenced by factors peculiar to that industry as well as by factors common to all industries."(Rowe, 1928, p. 44; Bowley, 1937, p. 10).

The degree of year to year variation differs widely among industries and, again, coal mining provides the extreme example of a volatile wage rate which was hardly ever constant between two years and sometimes varied by as much as 20% in a single year while, at the other extreme, wage rates in printing and railways remained constant for as much as a decade at a time and, when changes did take place, they were only by one or two percent[1]. It has often been suggested that differences in wage variation reflects the division between sheltered and unsheltered trades. In addition to coal, the metal trades, textiles and building were at the forefront of wage changes. Clegg Fox and Thompson commented that from 1893 to 1900, "they held undisputed leadership both in the period of cuts downto the end of 1895 and in the increases of the last five years of the century,

[1] This is most graphically illustrated in the wage indices produced by Wood (1899, pp. 664-5). Wood's original data were for trades in particular localities and the year to year stability is quite striking. However, aggregation for the country as a whole would produce much more variation as in the later series produced by Bowley and Wood (1898 - 1906).

accounting for over nine tenths of the workers affected ... Mining again led with 60% of total, metals had 19% and building and textiles took 8%. The rest were nowhere." (1964, p. 122). Hence, contrary to the view that relative wage rigidity would give rise to greater instability of employment, those industries most severely affected by fluctuations in activity were also those which experienced the most frequent wage changes.

The proportions quoted refer to the number of workers whose wages changed in a particular year. From 1893 to 1900 the total varied as a proportion of the industrial population from 14.9% in 1899 to 5.6% in 1896. (Board of Trade, Report on Changes in Wages and Hours of Labour, 1901). This figure is likely to be biased downwards due to under reporting especially amongst small firms and, of course, excluded non-industrial occupations like agriculture but, at least, it conveys some impression of the lack of pervasiveness across different groups which would be implied by small changes in the wage index.

It appears that the industries most subject to wage change were not necessarily only unsheltered industries facing the vicissitudes of foreign competition but those which, for one reason or another, faced the greatest variation in demand. This includes those such as building which experienced variations as great as many export industries. On the whole it was industries connected with exports and investment, the two most volatile components of aggregate demand, which exhibited the greatest variations in wages. In trades based on domestic consumption, wage rates tended to be less volatile. This is also reflected within industries, for example in coal mining, where wages in the exporting areas of Northumberland and Durham and South Wales varied more than those of the Midland coalfields[1].

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[1] This also had profound effects on the organisation of the industry, causing friction between the different areas and contributing to the fragmentation of national collective bargaining (Clegg Fox and Thompson, 1964, p. 102).

The most general explanations put forward for variations in wage rates are those which followed Phillips' (1958) famous paper, and which relate aggregate wage changes to the unemployment rate and sometimes other variables. This econometric literature is discussed in more detail in Chapter 3 where further work along these lines is attempted. Though some sceptics have argued that such a simple relationship would not be likely to hold at the level of the individual industry (Routh, 1959; Knowles and Winston, 1959), the finding that the amplitudes in activity and the frequency of wage changes tend to be associated, is some support for this approach as a broad generalisation. However, a variety of other variables affecting wage rates have been put forward in the historical literature and are often thought to have had different force in different industries. Rowe argued that the movement of the piece lists governing wages in the cotton textile industry were determined by the level of activity and by profit margins[1]. (1928, pp. 116-7). In coal mining, the strong correlation between miners' wages and the price of coal has often been noted . Like the iron and steel industry, for at least some of the period under review, there were institutionalised links between product prices and wage rates, either through sliding scale agreements or less mechanistic methods of wage settlement. It is not clear how far these methods of wage setting supplanted or altered the competitive mechanism and how far they merely transmitted competitive pressures into wage changes in an institutional and orderly framework. These arrangements often broke down and some further consideration is given to the probable impact of the growth of collective bargaining in section 2.6.

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[1] This relationship was formalised after 1893 in the Brooklands agreement (Hutt, 1975, p. 42).

In general, wage historians have emphasised that, although there was short run inertia in the adjustment of wage rates, they were constantly conditioned by the inexorable forces of competition. For example, Phelps Brown and Browne argued that there was constant pressure by workers to raise wages in booms and to resist wage cuts in depressions, and the degree to which they were successful depended on both economic and institutional factors (1968, p. 23-9). They went on to distinguish between sheltered and unsheltered trades and suggested that especially in the latter, "an international trend of unit wage costs was set up that, at any given time, acted as an externally imposed constraint on any wage negotiation, such that, so long as profit margins remained unchanged, money wage earnings could rise above the international level of unit costs only to the extent that productivity rose." (1968, p. 131)[1]. As has been noted, the unsheltered industries were also among those in which activity varied most and it is difficult to distinguish in some cases whether the proximate cause of wage changes was price changes or changes in activity. That these features tended to go together can be illustrated even within an industry. For instance, in coal mining, referred to earlier, prices, wages and activity tended to vary more in the exporting areas of the North-East and South Wales than in the inland areas.

Though regional wage differentials varied from time to time, over the long term, they remained remarkably stable. Within regions wage rates were often set by reference to a "leading bargain", one of the best known examples of which was the Oldham spinning list. In the building industry wage rates were often set with reference to those in the nearest important town. In his study of regional wage variations, Hunt found that in 1850

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[1] Cairncross also took this view, arguing that nominal wages were largely determined by export prices and hence, insofar as the cost of living was determined by import prices, the real wage for workers varied with the terms of trade (1953, p. 207.)

London and the Northern counties of England as far south as Birmingham. were the major high wage areas. In 1914 the same broad structure existed though South Wales and central Scotland were also in this group. (1973, p. 57). These were the most rapidly growing areas and though relative wage rates acted as a signal to migration, this did little to erode differentials. Taking into account differences in the cost of living and family income as a whole contributes little to explaining the persistence of these inequalities. These might indirectly be accounted for by differences in industrial structure but it appears most closely connected with the degree of urbanisation. In a contemporary study, Lawrence found that, in different occupations, wages were higher the larger the town and he concluded that "where higher wages are paid they are merely a higher price for a better article" (1899, p.54). This gains support from Hunt's finding that higher wages reflected higher productivity. (1973, pp. 204-214).

This argument may, perhaps, be more convincingly applied to occupational differentials. The existence and stability of these differentials has been a prominently noted feature of the wage structure and, in some industries such as building, they remained constant for decades or even centuries at a time (Phelps Brown and Hopkins, 1952). In general, unskilled wages in a trade were usually between 50 and 70 percent of the wage of skilled workers and, in semi skilled occupations, between 70 and 90 percent, depending on the industry concerned. (Rowe, 1928, p. 49; Knowles and Robertson, 1951, p. 111).

In a detailed examination of grades of engineering labour, Rowe found that differentials remained relatively constant 1886-1906 despite changes in relative skill content. Thus wage differentials could not

be explained by the demand and supply of skills and the educational quality of workers but by the "far reaching effect of sheer custom". (1928, p. 11). This view has been supported in a number of studies which suggest that differentials were unresponsive to variations in economic conditions except when there was major upheaval, for example during war and its aftermath (Knowles and Robertson, 1951; Routh, 1980). It is often cited along with evidence of regional differentials, as evidence that wage rates, as a whole, were and continue to be governed by forces largely outside those of supply and demand .

In recent papers, Williamson (1980, 1982) has re-opened the issue by examining a larger set of data which includes non industrial occupations in services and agriculture. According to Williamson, the results "offer little support for the premise of rigid wage structure or that pay patterns by skill are determined by non-market forces" (1982, p. 2). However, the evidence adduced indicates a gradual decline in the average skill differential at census dates but not that individual differentials varied from year to year or that the long term changes in the differential can be explained by variations in supply and demand for different skills.

The evidence for fixed differentials prevailing for decades or centuries at a time is greatest when differentials within an industry in a particular locality are examined. It also appears that where an industry was unionised, these relativities would be more rigidly adhered to. Comparisons with similar grades of labour in other industries would be less important than comparison with different grades within the industry as criteria for craft unions. This raises the general question of the possible importance of the growth of trade unions and in the process of wage setting.

2.4 Trades Unionism and Industrial Disputes

The development and growth of trade unionism is essentially a nineteenth and twentieth century phenomenon. By 1850 unionists probably numbered only a quarter of a million but, by 1888, when more precise information is available, they were three times as numerous and accounted for nearly ten percent of the adult male workforce. By the end of the period, membership had become much more widespread and amounted to nearly a third of adult manual male workers and more than two and a half million individuals (Clegg Fox and Thompson, 1964, p. 468).

As was pointed out with reference to the trade union returns on unemployment, membership was not evenly distributed either geographically or industrially, English trade unionists were largely concentrated in the most prosperous and heavily industrialised northern counties, while the majority of Scottish trades unionists were to be found in the Glasgow area. They were also concentrated in particular industries and dominant amoung these were metals engineering and shipbuilding, mining and quarrying, textiles, building and transport (Hunt, 1981, p. 251). The heavy industries were not quite as dominant among unionists as a whole as they were amongst those in the unemployment returns. However, they still consist overwhelmingly of workers from the craft or artizan class, sometimes referred to as the aristocrats of labour (Hobsbawm, 1964, Ch. 15). Nevertheless, despite this concentration, union density even in the most heavily unionised of major industries remained, with the exception of mining, below 25%. (Clegg, Fox and Thompson, 1964, p. 486).

The growth of unionism over time does not rise smoothly but in sharp bursts followed by stagnation or decline. Thus most of the growth of the whole period from 1850 to 1914 is concentrated in the periods 1871-3, 1889-91 and 1911-13, each of which saw a doubling of membership. (Hobsbawm, 1964, p. 127). To almost all students of labour history, they delineate phases in the development of unionism which are marked by qualitative as well as quantitative change. The mid-Victorian era of the '50s and '60s, was the heyday of the "new model union" both craft conscious and exclusive and epitomised by the Associated Society of Engineers which was born in the turmoil of the early 1850s. (Burgess, 1975, pp. 17-22).[1] The turning point of the early 1870s, accompanied as it was by an intense boom in the economy and permissive trade union legislation, is less often seen as fundamental than other expansions though it saw the extension of unionism to such areas as agriculture. The period that followed this was viewed by the Webbs (1920, pp. 343-350) as utter defeat for unionism of both the established kind and of incipient new areas of organisation. However, this has been subjected to criticism which suggests that, while members fell, organisation was maintained and unionism remained an independent force. (Lovell, 1975, pp. 10-13).

The next upsurge which is probably the most well known came with the rise of "new unionism" in 1889. This has been interpreted as an abrupt rise of unions whose characteristics were sharply different from

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[1] This image of unionism as exemplified by Hutt (1975, p. 25) has recently been criticised as grossly oversimplified because the 1850s and 1860s also saw the extension of unionism to non craft occupations such as mining (Hunt, 1981, p. 260-1). Hunt also argues that the compliance and quiescence of new model unions depicted by Hobsbawm and others should be viewed differently and that they were "opportunists and shrewd practitioners of the art of public relations" (1981, p. 262).

the existing ones[1]. They organised the unskilled or semi-skilled, were general in the sense of being open to different occupational groups, were fostered and led by new radicals or socialists, were administered and structured less as friendly societies and were therefore more militant and more coercive in their tactics. Clegg Fox and Thompson, who described the episode as "colourful and baffling", have criticised this simple typology on all counts, arguing that these were differences of degree rather than kind and, in many cases, new unions were only superficially distinct from older forms of unionism. (1964, pp. 55, 84-89). Others have suggested that even the differences in characteristics which did exist were narrowed as new unions either succumbed to, or retrenched against, deteriorating labour market conditions and the counter attack of employers which culminated in the Taff Vale judgement of 1901. (Webbs, 1921, p.77; Hobsbawm, 1964, p. 190-1). On the other hand, as a movement, its effects were probably as great and longer lasting on the old unions who, nevertheless, made up the bulk of the increase in total union membership between 1888 and 1890. (Hunt, 1981, p. 299).

The final upsurge of membership in the three years before the first World War saw the re-emergence of unionism similar to that of 1889. While this growth had similar characteristics, in so far as ideas were important, it was inspired by industrial unionism or syndicalism. Unions became more consolidated into large units and centralised in administration and new groups such as white collar workers emerged (Bain, 1970). It was also accompanied by increasing solidarity between unions and

[1] It has been argued that the appearance of new unions was not as sudden as is sometimes thought and the movement can be traced back at least to the mid 1880s. (Duffy, 1961.)

mutual support found its ultimate expression in the formation of the Triple Alliance of Miners, Railwaymen and Transport Workers. According to some writers, the impact of these developments was profound: "Everything pointed to a first class political and social crisis in the latter half of 1914" (Hutt, 1975, p. 65; see also Dangerfield, 1935, p. 400).

Each of these major surges in the growth of unionism was accompanied by a rash of strikes and labour unrest which change in nature over time and are symptomatic of the underlying phases of development . In the peak years of activity, more than a thousand strikes were recorded annually and the average number of workers involved doubled between the era of new unionism and the labour unrest of 1910-13. These discontinuities have been variously described as great leaps or explosions (Cronin, 1979, Ch. 5; Hobsbawm, 1964, p. 124) but there is little agreement about their causes. The Webbs, in their classic work on trade unionism, saw these movements as spontaneous developments essentially non economic in origin. Others, such as Hobsbawm, argue for the primacy of the cumulative effect of the increased intensity of work subject to the delaying mechanism of raising the consciousness of "raw" labour (1964, p. 145.) Another underlying force which appears at various levels impinging both directly and indirectly, is the discontinuity of technical and organisational change (Burgess, 1975, Ch. 1'.). In view of the fact that the evidence from productivity growth suggests a slowdown in the later part of the period, such hypotheses must remain in doubt[1]. (Cronin, 1979, pp. 96-7).

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[1] Cronin found that higher strike incidence was associated with slower productivity growth (1979, p. 85). It is interesting to note that Hobsbawm cited the demands for shorter hours as indicative of the increased intensity of work. He suggested that, in the case of the gas workers, the achievement of the eight hour day in 1889 actually led to technical change in the gas industry (1964, p. 137).

The timing of these major movements as well as the intervening fluctuations is more easily associated with economic variables. Hobsbawm argued that they triggered in the upswing of the trade cycle when prices were increasing more rapidly than wages while unemployment was declining (1964, p. 135). This is largely supported in quantitative studies which, owing to lack of data, generally link up the years from the early 1890s with later periods. Bain and Elshiek (1976, Ch. 5) found that the rate of change of union memebership could be adequately explained as a positive function of the rates of change of both wages and prices, thus the effect of the real wage is weak owing to the offsetting effects of wages and prices. It was also found to be a negative function of the rate of change of unemployment which suggests, at least, that membership is a strongly procyclical variable.

For strike activity, the estimated relationships are less satisfactory but the results are broadly consistent with those for membership growth. Bean and Peel (1976, p. 209) found strike frequency to be positively correlated with the rate of change of output but unaffected by the real wage and Sapsford (1975, p.245), using price change as an indicator of monthly variations in activity found evidence of a positive correlation. The most important variable, when it is included, is the rate of change of unionisation. As has been pointed out (Cronin, 1979, p. 105) the association between strike activity and membership growth is clear but the underlying relationship between the two is less so. In some cases, particularly at the time of new unionism and when strikes over union recognition were successful, they gave a powerful stimulus to unionism, while in other circumstances, substantial growth in membership must have been the precondition for a strike.

These studies imply, but do not test, the hypothesis that the direction of causality is from economic variables to unionism and labour unrest but not the reverse. Since it is hard to conceive of unions systematically causing cyclical fluctuations, this seems a reasonable presumption but it might not be accepted in the case of wage or, possibly, price change. Hines put forward the view that union density as a proxy for workers' militancy reflected the upward push to wages, independently of market forces. He found, however, that for 1893 to 1912, this did not give a satisfactory explanation and that, unique to this period, unionisation could be largely explained by unemployment (1964, p. 234).

Although the growth of unionism and the development of collective bargaining have been extensively studied by historians, Hunt has noted in his recent survey of labour history that "Perhaps the most remarkable aspect of union influence upon workers' welfare is how little it has been seriously considered. Too many union histories are merely descriptive and, in many others, the analysis stops short of this central question." (1981, p. 287). It was clearly an objective of trade unions to influence conditions of employment, hours of work and rates of pay in workers' favour and, sometimes, to bring about more fundamental changes in the organisation of industry[1].

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[1] In its Final Report, the Royal Commission on Trades Unions of 1867-9, defined the objectives of unions as follows:"With respect to the trade purposes of the unions, one of the most constant objectives is to obtain for the members the best rate of wages which they can command and to reduce the number of hours in which wages are earned. A further object is to bring about a more equal division of work amongst the members of the trade and its distribution among a greater number of workmen than would prevail under the influence of unrestrained competition; and this object is sought by attempting to establish a uniform minimum rate of wages"(1869, p. XIV). A range of different objectives in the constitutions of different unions are quoted by the Webbs (1898, p. 145-8).

Trades unionism was certainly a corollary, if not a pre-condition for the development of collective bargaining, through which the aspirations of unionists were expressed if rarely achieved. According to Hobsbawm, at least amongst groups of skilled workers, the period after 1850 marked a change in these aspirations as workers gradually shook off the standards of custom and tradition as guides to wage setting and began to learn the "rules of the capitalist's game" and, from the 1890s, they "began to charge what the traffic would bear and, where they ha any choice, to measure effort by payment" (1964, p. 345)[1]. Prior to this "employers almost certainly got their skilled labour in the nineteenth century at less than market cost" (1964, p. 348)[2] and the growth of unionism in skilled trades was both the expression of this change in attitude and the means through which it was made effective (Pollard, 1965, p. 111). Williamson's evidence for the decline in the economy-wide differential cast doubt on the quantitative importance of these changes (1982, p. 16) though it might be argued that after 1870 with more widespread access to education and technical change, this movement should be regarded as attempting to defend craft distinctions and wage hierarchies which were increasingly under pressure.

Given that there is virtually no long term trend in the share of wage payments in national income, it is difficult to discern any gains which trade union policies may have secured in aggregate though it is

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[1] Clegg et al. describe the inference that workers systematically restricted productivity as "unbelievable" (1964, p. 474).

[2] It might be supposed that, if this were the case, there would be chonic excess demand for labour but Hobsbawm's argument is more subtle. He suggests that the cheapness of labour caused employers to use it inefficiently and that when, in the later decades of the century, competition forced them towards more intensive utilisation, workers resisted such changes unless compensating wage increases were made.

possible that with absence of unions labour's share would have fallen (Pollard, 1965, p. 112). But this does not mean that important gains were not made; the wage rises such as those achieved by agricultural workers in 1872-4, the dockers and miners in 1889-90 and the successes of the nine hours and eight hours movements may not be reflected in aggregate data (Hunt, 1981, pp.289-98). Clegg et al. (1964, p. 337) suggested that unions' strength did prevent wage reductions after the turn of the century but concluded that in periods of boom "it would seem likely that economic conditions created the opportunity for the wage increase which, in turn, gave trade union organisation its chance" (1964, p. 483).

It is possible that the impact of unionism was to change the wage distribution without necessarily affecting total labour income. However, as has been noted, differentials between different grades of labour within industries were notoriously stable and even in the era of new unionism, when this might have been expected to narrow, the changes were only marginal and temporary (Pollard, 1965, p. 103). But this may not be an an appropriate test since unionism was strengthened in all groups and, at least among different grades of skilled labour, it is possible that differentials which might have changed in the absence of unions were maintained in the interests of union solidarity (Rowe, 1928, p. 110).

Summing up his survey of the available material, Pollard suggested that such gains in wages which might be achieved by an independent thrust would only have been transient unless they were broadly consistent with that which in the longer term the market might dictate[1]. "Unions of longer

[1] Some wage gains were held, such as those made by agricultural workers in the early 1870s but Hunt argued that "By 1879 wage levels were probably not much different than they would have been without the N.A.L.U." (1981, p. 257).

standing among skilled workers, especially where these occupied approximately their place within the scale of skill and wages, were least able to take any initiative other than to follow, more or less faithfully the state of the market. The widespread popularity of sliding scales reflects this basic aim faithfully ... where the market itself changed rapidly or violently, the 'market component' of the wage determinant was much greater than any possible 'organisational component' and the unions themselves frequently appear as little more than playthings of the market situation." (1965, p. 111).

Thus where these issues have been raised by labour historians, there is a strong impression that unions did not have power enough to raise wages progressively away from equilibrium levels. But, within those limits, the actual size and timing of wage adjustments owed a great deal more to the initiatives of trade unions and to the operation of the mechanisms of collective bargaining. It is to the latter we now turn.

2.5 The Development and Impact of Collective Bargaining

The term "collective bargaining" has been subject to a wide range of different interpretations. Some writers have viewed it relatively narrowly as describing formalised or institutional procedures for the agreement of wages and conditions (Webbs, 1898 , Ch. 11) and sometimes only where such agreements extended beyond the local district (Rowe, 1928, p. 137). This is likely to lead to a restricted impression of the diffusion of collective bargaining which, before 1914, was conducted at a variety of different levels and different degrees of formality. The key feature is that agreement or disagreement was by workers' representatives, bargaining on behalf of a larger group with employers or their representatives.

This is usually thought to have begun on a significant scale in the late 1860s and early 1870s with the rise in popularity of formal procedures of conciliation and arbitration. The first attempts at such agreements among silk weavers, shipwrights and printers date back to the 1850s (Hicks, 1930, p. 26-7). The Bolton spinning list of 1853 is said to have been the first jointly negotiated agreement and this was followed by other relatively formal agreements. But one should not overestimate the number, durability or uniformity of these in setting wage rates (Chapman, 1899, p. 594). At least among the craft industries where unionism was well established, such as building, engineering, shipbuilding and printing, such agreements, whether implicit or explicit were widely recognised and were not without influence in adjoining and less developed areas.

The growth in number and influence of these agreements is the major feature in the development of industrial relations before 1914[1]. In the early years, agreements were few and this led to periodic disturbances in some trades, particularly hosiery. According to Hicks, "the main difficulty seems to have been that, as a largely exporting industry, demand for its products was very variable. Wages formed a large proportion of costs and, in consequence, the temptation to make wages bear the burden of fluctuations was irresistable" (1930, p. 28). The lead taken in this industry in forming a local Board of Conciliation and Arbitration was followed by others such as the building trades, potteries and iron industry.

The success or failure of these boards depends upon the criteria upon which they are judged. The life of each board was, on average, very short and disputes often followed the repudiation by one side or the other of the agreement (Porter, 1970, p. 467). But the essential process of negotiation and collective bargaining, once established, often continued even in the absence of formal arrangements (Sharpe 1950, p. 5). Wage setting was only one of the issues dealt with by the boards though it was often the most important and the criterion most frequently referred to in negotiations was the current state of the trade. (Porter, 1970, p.463) In those industries with relatively homogenous products, the best available

[1] By the first decade of the century, according to the Webbs, "whole sections of the wage earning class, not included in any Trade Union, habitually have their rate of wages and often other conditions of their employment settled by Collective Bargaining". They expressed the view that, as a result of this, as many as 90% of skilled factory workers had their wages or their hours of work determined by a collective bargain. (Webbs, 1898, p. 177-8). The influence of these bargains often extended to other grades of labour so that, although unskilled workers were not directly covered, their wage rates would ususally be adjusted to maintain the skill differential. (Rowe, 1928, p. 154).

index of prosperity, as a whole, was the price of key products. "It was a short step from this to save argument by agreeing to a scale by which wages should change with prices" (Hicks, 1930, p. 37). As previously noted, the industries in which there was most urgent need for a means of adjusting wages relatively frequently were those which were most subject to severe cyclical fluctuations. Thus sliding scale arrangements were predominantly found in the iron and steel industry, mining and the building trades (Sharpe, pp. 16-17, 58-59; Porter, 1971)[1] In iron and coal the regions in which sliding scales had long if chequered careers were the areas most heavily engaged in exporting (Clegg et al. 1964, p.102) In industries such as engineering and textiles, sliding scales were not used largely because no single price could adequately represent the fortunes of the industry. Yet in many cases the alternative machinery produced rather similar results. In engineering, for example, "cyclical fluctuations provided the context for numerous local struggles, yet these were played out according to mutually acceptable ground rules like the 'state of trade' and 'what the industry could afford'" (Burgess, 1975, p. 4) Where the awards of arbitration were followed, these also showed a close correspondence with the index of industrial activity (Porter, 1970, p. 465).

Though these arrangements are often interpreted as implying passiveness of unions on wage negotiation, they were important for other reasons. The establishment of formal boards were often the first step

[1]Sliding scales typically indexed wages to prices such that wages were inelastic with respect to prices. Thus, for example, under the sliding scale for blastfurnacemen in the Cleveland district in 1910 at the standard wage the wage rate was related to the price of No. 3 Cleveland pig iron with an elasticity of 0.51. (Calculated from Board of Trade Report on Collective Agreements, 1910, p. 84).

in gaining union recognition by employers. According to the Webbs, formalised agreements allowed the enforcement of a standard rate over the area which both sides found to their benefit. For employers it reduced the risk of being undercut by low wage competitors while, for workers, it reduced the risk of being undersold by others in the same labour market. (Webbs, 1898, p.286-7) Despite the fact that unionists were often a minority of workers in the area covered by an agreement, it would typically apply to unionists and non unionists alike. In addition, although it was usually second in importance to selling prices, the comparison between one area or district and another frequently played an important part in wage setting (Porter, 1970, pp. 462, 464)

These agreements continued as the most prominent mode of collective bargaining arrangement throughout the 1870s and 1880s despite the fact that this was an era when prices fell almost continuously. Some writers have argued that this reflected the weakness of unionism and stemmed its expansion but, as Lovell has observed, in the absence of such agreements, union membership might have declined even more than it did (Lovell, 1977, p. 14). In addition the gearing of the sliding scale, giving smaller proportionate changes in wages than in prices or, as in the case of the South Wales miners, the minimum set, may have given workers a temporary advantage (Morris and Williams, 1960, p. 173). This was enhanced by the tendency of foodstuffs to fall in price faster than manufactures.

In the 1890s in the wake of new unionism, sliding scales were increasingly repudiated especially in the mines where the notion of a fixed minimum wage became influential (Sharpe, 1950, pp. 16-20). But the framework of conciliation remained important and was often substituted for sliding scales. (Sharpe, 1950, p. 20). The Royal Commission on

Labour, reporting in 1894, gave strong support to collective bargaining and suggested that it was most effective when both workers and employers were highly organised. Though the conciliation act which following in 1896 had little direct effect, it reflected the extent to which conciliation was regarded as the means of avoiding disputes. (Pelling, 1976, p.122).

In the following decades, commensurate with the growth of both unionism and employers'associations, formal collective bargaining was extended into industries and areas hitherto little affected. The number of conciliation boards expanded from 64 in 1894 to 162 in 1905 and 325 by 1913 (Pelling, 1976, p. 143). The scope of the issues within their compass increased while, at the same time, the coverage of individual agreements grew in size as bargaining units expanded in size and cohesiveness. "Whereas in 1890 few joint negotiating boards covered employment beyond a city and its environs, by 1914, numerous trades negotiated on a county or regional basis and some boards covered an entire industry" (Hunt, 1981, p. 327). A Board of Trade Report of 1910 detailed all the known collective agreements in existence at that time which amounted to 1696 covering an estimated 2.4 million workers[1].

But even by 1914, the national agreements in existence were largely procedural in nature and set out the framework for bargaining at district or country level, providing a centralised appeals procedure. In this

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[1] Only 30 of these were sliding scales, 563 were piece lists and 1103 working agreements of various kinds. In the introduction, it was noted that "there are a large number of workpeople whose wages, hours of labour and other industrial conditions are, in effect, governed by the Collective Agreements in force for the time being in the trades concerned. For this reason the total number of work people either directly or indirectly affected by the 1696 agreements referred to is very materially in excess of 2,400,000 ." (Board of Trade, Report on Collective Agreements. 1910, p. iii)

respect the Brooklands agreement in cotton spinning provides an important landmark and, by 1910, such agreements covered textiles, engineering, shipbuilding, printing, iron and steel and footwear, traditionally the industries at the forefront of collective bargaining. In some cases they also embraced substantive issues such as conditions of work but rarely wages and in cases where this was achieved, such as in mining, a national agreement was reached which was subject to substantial variation at district level (Clegg et al. 466-475). As part of this trend the comparative principle in wage setting grew in importance. According to Hunt, compared with earlier years where regional wage differentials were more passively accepted, these tended to be eroded after 1890 (1973, pp. 334, 347).

It is difficult to judge the impact of these developments on the short run wage flexibility and adjustment of the economy as a whole. The very fact of the effort invested in developing collective bargaining and the importance with which it was held suggests that, under such arrangements, the outcome would be somewhat different from that which would have obtained in their absence. It was clearly an objective of unions to reduce wage variation though it is not obvious that this was achieved to any great extent (Sharpe, 1950, p. 59). It is not clear that this would raise the average of wages over time and it seems highly unlikely that this was the case and to the extent that wages were less flexible, it is possible that employment varied more than otherwise. Even so, there are several reasons why this might have been preferred. The potential costs of regular re-negotiation of agreements could be large especially if, due to uncertainty on both sides, there might be a range of possible solutions to any negotiation. The use of sliding scales and the reliance of arbitration also supports this view. Failure

to reach an acceptable settlement often undermined union solidarity especially where unions only had a partial hold. According to the Webbs, the functions developed by unions can be seen precisely in this context. Friendly society benefits for sickness and unemployment prevented unemployed members from undercutting their colleagues and gave workers greater motive for loyality to the union. In turn this allowed the unions greater power to defend the standard rate. (1898, Part II, Ch. 10). This, however, does not go far towards answering Hunt's question about the impact of unions on the welfare of workers and we turn to discussing this issue in a wider context.

2.6 Work and Welfare

The growth in real income reflected in the rise in real wages between 1855 and 1913 represents a substantial advance in welfare derived from work. The expansion of higher wage occupations relative to others was an important part of this improvement and underlines the fact that, while most generations experienced a rise in living standards, this would not necessarily apply to each individual or each group. There are also a variety of non wage factors affecting welfare, such as changes in the arduousness of work which, according to some writers, was intensified especially in the 1880s. Though the continued spread of mechanisation lightened the physical burden of many jobs, it would not necessarily increase individual welfare where machines controlled the pace of work previously done by hand and especially where existing skills were made obsolete and employment prospects threatened. Even though the incidence of death or injury from industrial accidents cannot be interpreted as a measure of the intensity of work effort as Hobsbawm (1964, p. 138) was willing to do for railways, it still reflects one aspect of the disbenefits from work. Between 1888 and 1904, the number of fatal accidents enumerated in factories and workshops doubled while non fatal accidents quadrupled. But this probably reflects increasing mechanisation and increasing enumeration since, among miners and railwaymen, the fatality rate fell.

The growth of collective action and waves of strikes which might be regarded as reflecting increasing disaffection are more likely to represent increases in the willingness and ability to express grievances rather than increases in the number of grievances or the intensity with which they were held. Though the effect on wages is not clear, unrest

was often accompanied by gains in the form of reductions in working hours. These changes were also closely associated with phases in the development of Trade unionism and industrial relations. But they were also partly a result of government intervention in the extension of factory legislation which limited the working hours of juveniles and, in the case of railwaymen and miners, of adults (Hunt, 1981, p. 79). However, changes by voluntary agreement took place in many organised sectors and were soon extended to other industries and areas. These were largely a result of the widespread desire of workers for shorter hours (Beinefeld. 1973, pp. 82-3, 224). The shortening of normal hours worked and, in some industries, the establishment of a standard week between 1850 and 1890 encouraged the spread of hourly rates of payment and the establishment of overtime premia and, in consequence, actual hours worked fell by less than normal hours[1]. However, in engineering, there is evidence that the average number of overtime hours worked was not large enough to compensate for hours lost due to unemployment and sickness (Board of Trade, 1904, p. 100).

That workers' demand for leisure increased can be seen from the growth of participation in sporting activities directly connected with the Saturday half day, the rise of various entertainments such as music halls and the growth of coastal resorts which could be reached by rail even though holidays with pay were exceptional. Although working class expenditure became more diverse, the average proportion spent on the necessities of life remained high. A survey of 1944 workmen's budgets

[1] Given that movements for shorter hours were often associated with efforts on the part of trade unions to restrict labour supply and force wage increases, they cannot be viewed entirely as the expression of an income effect of higher wages or , alternatively, as a substitution effect of increasing disutility from work.

conducted by the Board of Trade in the early 1900s, showed that, out of an average family income of 36s.10d., expenditure on food accounted for 22s. 6d. (61%) and the bulk of the remainder went to fuel, rent and clothing. At the highest end of the scale, those with a weekly income of more than 40s., spent 57% on food while, at the other end, those with less than 25s., spent 67.5% of income on food. (Board of Trade, 1904, p. 9). The average income level in this lowest group was below the 21s. 8d determined by Rowntree as the minimum necessary with judicious purchases for a family of five to maintain physical efficiency (Rowntree, 1902, Ch. 5)[1]. The studies of Booth and Rowntree revealed that approximately 30% of the populations of London and York were either in "primary poverty" with income below this minimum line or spent their incomes in a way which put them below the poverty line.

Booth and Rowntree also drew attention to the causes of poverty. Individuals often moved into and out of poverty as family circumstances changed and young children, sickness, widowhood and old age either increased need or diminished earning power. The causes directly connected with the labour market were low wages and irregular employment and Rowntree found that 55% of poverty in York was due to the former. As the earlier discussion of wage differentials showed, these would typically have been the families of the unskilled and labourers, rather than the higher paid skilled and semi-skilled workers. Frequently a family could only remain out of poverty by supplementing the earnings of the main breadwinner and Bowley found that in 1911 some 60% of working

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[1] In the sample from the 1911 census analysed by Bowley, the average working class family consisted of 1.9 persons occupied and 2.3 persons dependent (1921, p. 103).

class household incomes were made up in this way (1921, p. 106). In London, where wages were higher, about half of those in poverty were there because of unstable or irregular employment which was commonly associated with the casual labour market where unskilled and undifferentiated workers were hired by the day or for even shorter periods. The most notorious example was in the London docks which was studied in detail both by Booth and Beveridge but the essential features of casualisation extended to a range of occupations especially in building and transport (Stedman Jones, 1971).

This is not to say that workers in more regular and better paid occupations were not at risk. Booth found that "while many men in almost every trade, work with practically no loss of earnings and some do even in the most irregular and uncertain employments, others are habitual half-timers". (Booth, 1902, vol. V, p. 280). This observation was supported both by Beveridge and, in their survey of the unemployed in York for 1910, by Rowntree and Laskar, who found that about half the genuinely unemployed were not handicapped for employment by physical, mental or moral defects. But, like Booth, they added that this "does not imply that they were on the same level with the best sections of employed workers, for when demand for labour shrinks, the less efficient men are generally the first to be dismissed, ... But our figures show very clearly that it is quite a mistake to regard the unemployment problem as primarily one of the character and efficiency of workers." (1911, pp. 304-5).

Some workers who found themselves continually on the margin of a trade would drop down to lower occupations - from skilled or semi-skilled to labourers or from regular to casual employment. Booth viewed this

process with alarm and sought means of avoiding the inevitable deterioration that this brought with it. Like him, Rowntree and Laskar found that once having become casuals "almost of the men in this class are undergoing a more or less rapid process of deterioration" (1911, p. 135) and Beveridge referring to conditions on the Docks, concluded that"casuals by necessity are always on the way to become casuals by inclination" (1930, p.142). A substantial proportion of those working on the West India Docks in the 1880s had previously been in occupations like artisans and mechanics, soldiers, sailors and ordinary labourers. At times of general recession, unemployment would appear in most trades but in urban areas such as London, workers unseated in their normal occupation, would seek a casual or labouring job, throwing the burden of unemployment on the less efficient in the lower groups (Stedman Jones, 1971, pp. 74-5). Analysing workers who had once been in regular employment among their sample from York, Rowntree and Laskar concluded that many had become casuals "simply because when dismissed they had no financial reserve to enable them to hold out until a fresh post was found" (1911, p. 28).

The ultimate resource for those forced out of even the most low paid and irregular employment was the Poor Law. But, despite the large numbers living in poverty, only a small proportion appeared at any one time among those being given relief. This stood at 4.8% of the population of England and Wales in 1855 and by 1914 had declined to only 2%. A largerproportion than this would, at some time, have sought relief from the Boards of Guardians but a larger proportion than the 30% of Booth and Rowntree would have faced poverty at various times in their lives (Rose, 1972, p. 14). This largely reflects the stringent conditions under which poor relief was dispensed and the principle of less eligi-

bility which reinforced the stigma attached to applicants for relief. This and the discouragement to outdoor relief for the able bodied poor, ensured that a preponderance of those involved were relieved on account of age, infirmity or widowhood. The deep dread of the Poor Law compelled those who were not too incapacitated, even vagrants, to shun it even though they may have faced worse conditions outside the workhouse (Rose, 1972, pp. 19, 17).

Nevertheless there is evidence that the numbers on relief fluctuated with economic conditions as revealed in the comparison of the average proportion of population on relief with the trade union unemployment series in Figure 2.6 . The series of indoor relief in England and Wales is used because indoor relief was more prevalent in industrial and urban areas because the workhouse, rather than outdoor relief, was usually applied to the unemployed as opposed to those among the sick, elderly or incapacitated, who could maintain a degree of independence. The relationship exhibited by the two series is quite close except during the 1880s and during the time of the Royal Commission in the Poor Laws. From 1870 onwards, there is also some evidence of a lag of the poor relief series behind the unemployment series of one to two years[1].

This relationship, however, should not be taken as a measure of the direct effects of unionists being driven into the workhouse but, rather, as some confirmation that the trade union series largely reflects conditions in all sections of the labour market. For the

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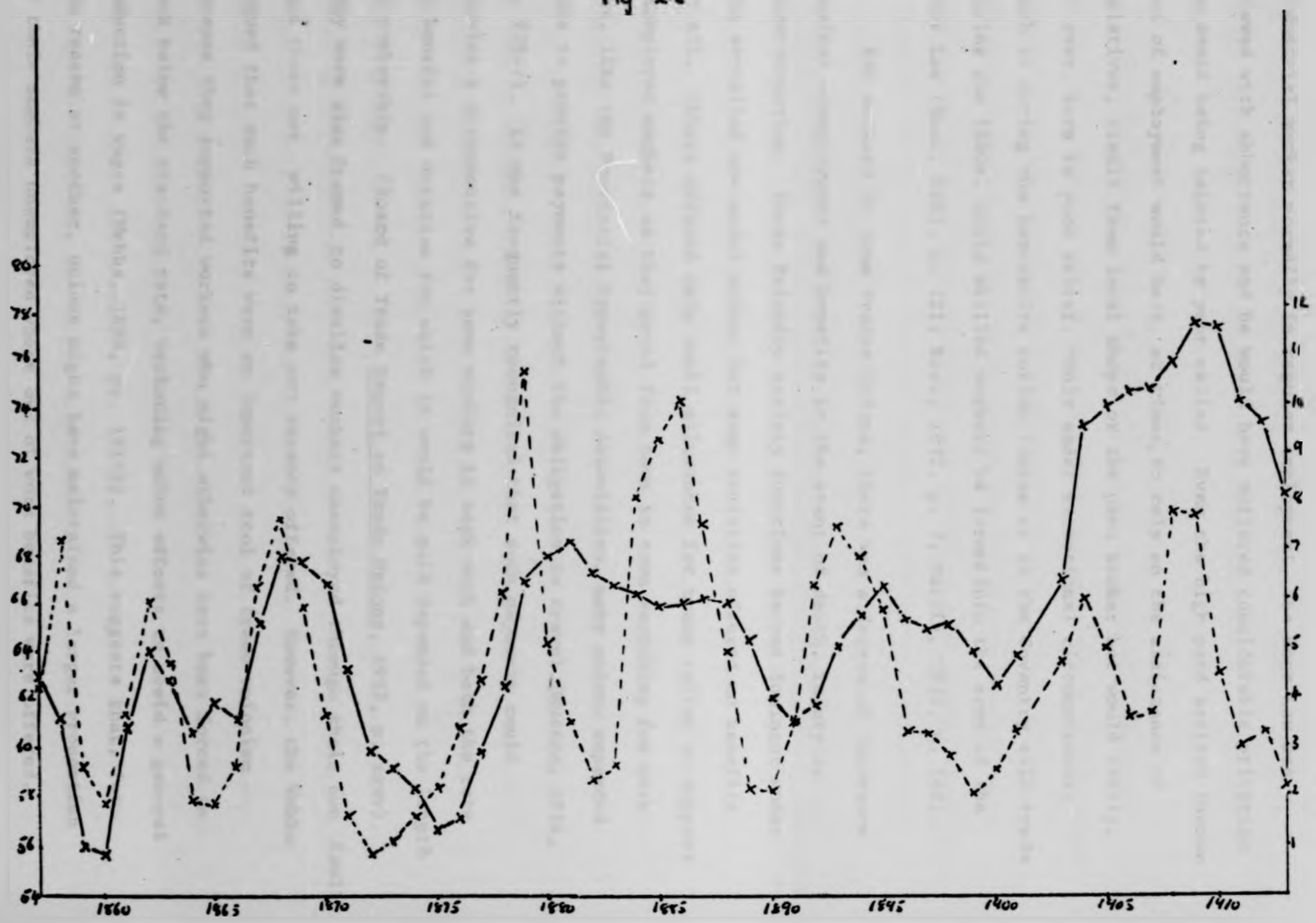
[1] Easton estimated equations with the number on indoor relief per thousand of the population as a function of a string of variables including the unemployment rate. Unemployment was highly significant though it did not account for a very large proportion of the total variation in numbers relieved (1978, p. 46).

Fig 2.6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industrial worker normally in regular employment, the Poor Law was viewed with abhorrence and he would have suffered considerable privation to avoid being tainted by poor relief. Even the high paid artisan thrown out of employment would have, at times, to rely on the assistance of relatives, credit from local shops or the pawn broker but would rarely, if ever, turn to poor relief. Only under exceptional circumstances, such as during the Lancashire cotton famine or in the Coventry silk trade during the 1860s, would skilled workers be forced into the arms of the Poor Law (Hunt, 1981, p. 121; Rose, 1972, p. 7; Harris, 1972, p. 148).

For workers in some trades unions, there was a degree of insurance against unemployment and benefits in the event of death, injury or superannuation. These friendly society functions became dominant under the so-called new model unions but some societies offered no benefits at all. Others offered only small allowances for tramp relief to support unemployed members as they moved from town to town searching for work but, like the Provincial Typographic Association, many unions expanded this to provide payments without the obligation to travel (Musson, 1954, p. 275-7). It was frequently recognised that such payments could provide a disincentive for some members to seek work and both the rate of benefit and duration for which it would be paid depended on the length of membership. (Board of Trade Report on Trade Unions, 1912, p. xxxv). They were also framed to disallow workers unemployed through their own fault and those not willing to take any vacancy offered. However, the Webbs argued that such benefits were an important tool of trade unionism because they supported workers who might otherwise have been forced to work below the standard rate, weakening union efforts to avoid a general reduction in wages (Webbs, 1898, pp. 161-2). This suggests that, for one reason or another, unions might have maintained a larger proportion of their members unemployed where out of work benefits were offered.

The potential effects of such benefit provisions are examined in more detail in Chapter 3 where attempts to measure such effects directly are made.

The provision of friendly society benefits cannot be seen purely as part of a narrow trade union strategy but as part of a more widespread movement. Unions often provided schemes for sickness and accident and superannuation benefits which, in an average year accounted for as much as half of total expenditure . The growth of such schemes in trade unions is parallel with the much wider phenomenon of the development of self help institutions. Societies such as the Oddfellows and Forresters which emerged in mid-century, provided a variety of benefits though they were predomimantly for sickness, accident, death and superannuation. These overlapped with trade unions to some extent, and sometimes offered benefits such as tramping allowances, though out of work benefits were rare. Their membership was drawn disproportionately from among skilled workers and artisans (Gosden, 1973, pp. 60, 46) but it extended much further than that of trade unions. By 1872 it exceeded 1.8 million and the Royal Commission on Friendly Societies estimated that 8 million persons had interests in them as beneficiaries (Gosden, 1973, p. 74). There were also parallels in the development of the co-operative movement from the 1840s and in building societies from the 1830s (Pollard, 1960, p. 109). It has been argued that this development was strongly influenced by the desire among the artisans of the labour aristocracy for respectability as a measure of status which was derived from the independence of credit and charity which was afforded (Grossick, 1976, p. 307). While this may explain the exclusiveness and ceremonial nature of many societies, it does not account for the wider movement. Many societies were not self managed

by the members and merely collected subscriptions to provide insurance against particular contingencies (Gosden, 1973, p. 120).

While skilled workers were generally better protected, this largely reflects their higher incomes which made subscriptions more easily affordable. Among all workers in the hierarchy of wages and skills, however, the growth of these institutions reflects the desire to provide security against industrial and personal contingencies and protect their status in the social hierarchy. Nowhere is this more evident than in the growth of small savings where many accounts were held by groups such as common labourers, agricultural labourers and women and children who did not have access to friendly societies (Gosden, 1973, pp. 228-30)[1] These were people for whom regular payments might be difficult but who were anxious to protect themselves against the vagaries and uncertainties of life and desired to avoid the stigma associated with becoming charges on organised charity or the poor law.

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[1] By the early 1890s the post office savings bank alone had nearly six million deposits with average balances of nearly £15 in addition to which there were a range of Trustees savings banks and those specialising in small deposits such as the Yorkshire Penny Bank.

2.7 Equilibrium in the Labour Market

In the next chapter we examine a model of equilibrium unemployment and apply it to the series for trade union unemployment before 1913. Before proceeding with this, some justification of the approach is required. It is worth while, therefore, briefly summarising some of the main features of the labour market which have emerged in this chapter and which suggest that the equilibrium approach is appropriate for the pre 1914 period.

The period is characterised by regular cycles in trade union unemployment and in activity as a whole which can be associated with various forces at work in the macroeconomy, both monetary and non-monetary but, above all,with variations in exports imposed by the openness of the British economy. However, periods of very high and very low unemployment were brief, lasting a few years at the most, and the economy fluctuated about a roughly constant average level of some 4.5% with no long run trend. This constancy over a long period suggests that there were strong equilibrating forces at work in the labour market.

In examining variations in average wage rates, it was found that there were regular fluctions, both upwards and downwards, following broadly the cyclical pattern on a gradually rising trend. Though wage differentials between grades of labour in an industry often remain fixed or atable, wage differences between industries varied over the cycle. Those industries which accounted for most of the wage variations were also those in which the level of activity and, hence, unemployment varied most. Hence unemployment variations were associated with wage flexibility rather than with wage rigidity. In some industries most exposed to variations in demand, wage flexibility was built in to the collective bargaining arrangements which developed during the period.

Though the period saw the growth of trade unionism, from narrow craft origins to organising an increasingly large and significant section of the workforce, there is little evidence that unions exerted a systematic independent influence on the wage bargain. Union policies were constrained by strong economic forces beyond their control and unions themselves were in the grip of the cycle which determined the ebb and flow of both membership and militant activity. Though militancy sometimes brought rewards, the most important function of unions in protecting the welfare of workers was in providing sickness and out-of-work benefits to help their members avoid the demoralisation of the poor law. There is also evidence that where such benefits were not provided or in addition to those that were, workers and their families sought protection through other clubs and societies and, despite their poverty, through accumulating small savings.

CHAPTER 3

THE LABOUR MARKET AND UNEMPLOYMENT 1855-1913: AN EQUILIBRIUM APPROACH

3.1 Equilibrium Unemployment and the Phillips Curve

In the light of the findings in the previous chapter, it seems appropriate to use a model to describe fluctuations in trade union unemployment which assumes that, at least to a first approximation, labour market clearing prevails at each point of observation. Unexpected variations in demand cause changes in prices and wages which are not immediately perceived.or absorbed into expectations of the future. This causes the supply curve of labour to shift around its long run level which yields the "natural" rate of unemployment. The insights upon which this approach is based arise essentially from reconsidering the analysis first put forward by Phillips (1958). But in the traditional approach, wage and price changes are viewed as determinants of variations in the unemployment rate rather than the other way round. The literature concerning this relation for the British economy before 1913 is discussed further below.

In a more general context, the original Phillips curve approach and the developments from it are reviewed at length by Santomero and Seater (1978) who critically distinguish between various versions. The modern analysis starts with a reconsideration of the microeconomic foundations of labour supply decisions when information is incomplete or costly to acquire. The reinterpretation derives from the seminal volume edited by Phelps (1970) in which a number of alternative models were presented, some of which were more "Keynesian" than others but which all produced a long run equilibrium level of unemployment. The essence of two of the more neoclassical models which have passed into general use can be discussed in turn.

The first was originated by Lucas and Rapping (1969) and is based on intertemporal variations in individual labour supply. The individual is assumed to attempt to maximise his multi-period utility such that, in any period, labour supply depends on current and future expected values of the real wage and real assets. Thus there are both intertemporal substitution and income effects and, if the former dominates, then the effect of a current real wage which is lower than that which is expected to prevail in the future, is to lower current relative to future labour supply. Thus, although labour supply may be inelastic with respect to the "permanent" real wage, it is more elastic with respect to transitory variations in the real wage. Only the future is unknown and perfect information about the present is consistent with the labour market being regarded as in short run equilibrium at each point in time.

This can be illustrated in Figure 3.1 for variations in the wage, W. The supply schedule is drawn as an upward sloping function of the deviation of the wage from its permanent or expected value $W - W^e$. If W is equal to W^e, then employment is at E_1 and, assuming for convenience that the labour force is fixed at L, unemployment is at its natural level U^*. If the wage is higher than anticipated as at $(W - W^e)_2$ demand has apparently risen from D_1 to D_2 which yields the new employment level E_2 and unemployment $L - E_2$ which is below the natural level.

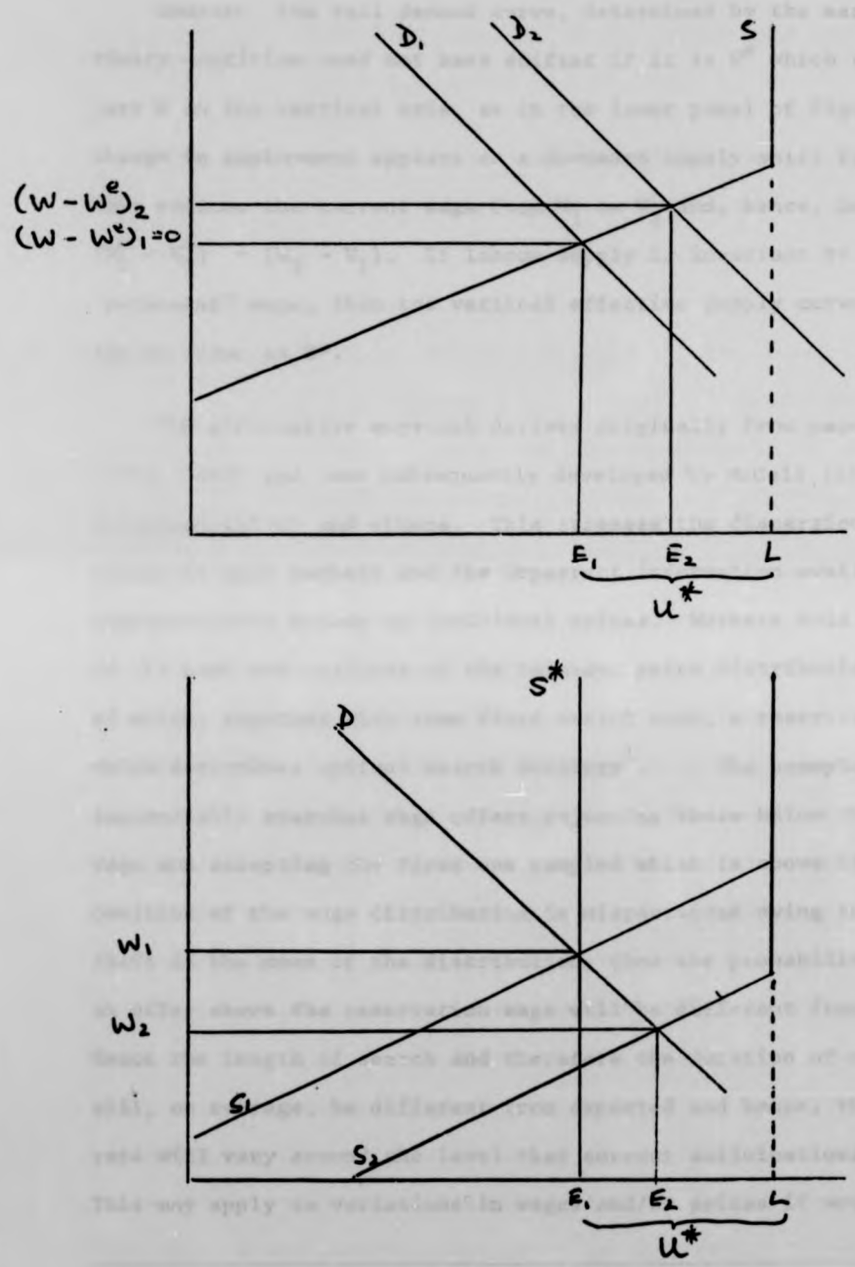

Figure 3.1

However, the real demand curve, determined by the marginal productivity condition need not have shifted if it is W^e which changes. With just W on the vertical axis, as in the lower panel of Figure 3.1., the change in employment appears as a downward supply shift from S_1 to S_2. This reduces the current wage from W_1 to W_2 and, hence, implicitly $(W_2^e - W_1^e) = (W_2 - W_1)$. If labour supply is invariant to change in the "permanent" wage, then the vertical effective supply curve of labour can be drawn as S*.

The alternative approach derives originally from papers by Stigler (1961, 1962) and was subsequently developed by McCall (1970), Mortenson (1970) and others. This stresses the dispersion of wages or prices in spot markets and the imperfect information available to the representative worker on individual prices. Workers hold expectations on the mean and variance of the relevant price distribution on the basis of which, together with some fixed search cost, a reservation wage is formed which determines optimal search strategy[1]. The unemployed worker sequentially searches wage offers rejecting those below the reservation wage and accepting the first one sampled which is above it. If the position of the wage distribution is misperceived owing to an unexpected shift in the mean of the distribution, then the probability of receiving an offer above the reservation wage will be different from that anticipated. Hence the length of search and therefore the duration of unemployment will, on average, be different from expected and hence, the unemployment rate will vary around the level that correct anticipations would yield. This may apply to variations in wages and/or prices if workers are

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[1] The reservation wage is set at the level which equates the marginal expected gain and the marginal cost of search . It is obtained as the solution to the following equation

$C = \int_A^\infty (W-A) fW dW$ where C is the cost of search, W is the wage, fW the wage distribution and A the reservation wage

concerned with their real wage and to the extent that the time distributions are not learned of immediately.

Both these approaches are augmented with expectations generating mechanisms such that workers revise their estimates of expected current and/or future wage rates in the light of past experience. Thus, once any trend becomes fully anticipated, unemployment reverts to the natural rate even though prices and wages may continue to rise or fall - only when they are accelerating or decelerating does unemployment diverge from the natural rate. This yields the result that, in the long run, there is no trade off between unemployment and inflation.

Both approaches may have relevance to the ninteenth century labour market. Market clearing may be an appropriate approximation to the operation of the labour market when institutional rigidities were relatively weak. Lucas and Rappings model would, perhaps, be more appropriate to casual and unskilled labour markets in which there were frequently large seasonal and cyclical variations in participation. The search model seems a rather more attractive characterisation of skilled labour markets and therefore of unemployment amongst unionists. Hobsbawm has described how workers in craft societies frequently tramped from town to town in search of work, subsisting on the hospitality of local branches or on tramp allowances. In the 1860s and 70s especially in depression years, tramp cards issued amounted to as much as 30% of membership for some societies but the practice underwent steady decline as unions turned increasingly to out-of-work benefits for the static unemployed (1964, pp. 43 - 51). Since search unemployment is essentially frictional, it is often thought to imply relatively short average unemployment durations. On the basis of a wide range of evidence, Beveridge in his early work on unemploy-

ment stressed the importance of labour market frictions, arguing that "There are specific imperfections of adjustment which are the economic causes of unemployment"(1930, p. 5). It was this which led him to become, in the years before 1914, one of the foremost exponents of the institution of labour exchanges which would increase the flow of information and reduce unproductive job search. (Harris, 1972, p. 285). Under unchanged conditions this might have been expected to lower the natural rate of unemployment, increase aggregate welfare and reduce poverty. (The case is argued in Beveridge, 1930, Ch. 9).

As has been indicated, theories of search or intertemporal substitution lead to a relationship which, in the short run, is closely analogous to the famous Phillips curve. As is well known, Phillips (1958) estimated this relation on data for the U.K. over the period 1861-1957. What is not so frequently remembered is that Phillips only fitted his curve to the observations from 1861 to 1913 and then simply imposed it on the remaining observations. The relation between unemployment and wage change is, however, much weaker in subsequent periods and, as will be shown in the discussion of the following chapter, it virtually disappears in the interwar period alone. In the first paragraph of his paper, Phillips argued that the relationship was that wage adjustments were caused by disequilibrium in the labour market as reflected by the level of unemployment (1958, p. 283). This approach was maintained in much of the subsequent work on the Phillips curve and has been followed in all the subsequent work on the pre 1914 period.

In his original function, Phillips found that the relationship was highly non linear and that, for wage rates to be stable, the unemployment rate would have to remain at about 5.5% but, with productivity growing at 2 per cent, a rate of unemployment of just over 2 per cent would be consistent with price stability (1958, p. 299). He noticed that the observations fell in anti-clockwise loops around the curve and that these appeared to narrow over time, The loops themselves were attributed to vigorous bidding up of wages by employers when unemployment was falling and the reverse in the recession as future labour market conditions were anticipated. He suggested that the narrowing of the loops was due, in part, to the declining weight of the sliding scale industries in the unemployment index and the growth of arbitration and conciliation which introduced a lag in the response of wages to unemployment.

The narrowing loops hypothesis was subsequently rejected by Routh (1959) on the grounds that the metal using industries did not have a declining weight in the unemployment index and also by Lipsey (1960, p. 7) on the grounds that, as measured by the coefficient on the rate of change of unemployment which took a negative sign when entered in the equation, the loops did not narrow significantly. Routh's main concern was that the wage and unemployment indices had different and rather arbitrary weights but reducing the weight of the engineering, shipbuilding and metals industries in the unemployment index affected the results remarkably little though it tended to shift the curve downwards and reduce the size of the loops. Both Routh and later, Gilbert redefined the independent variables to avoid the possible spurious autocorrelation introduced by Phillips' use of first central differences but the rate of change of unemployment which accounts for the loops remains significant, though serial corelation is reduced (Routh, 1959, pp. 308-9, Gilbert, 1976, p. 54).

Lipsey developed the hypothesis that, if the relationship was non-linear in individual labour markets, the greater the dispersion of unemployment among these markets, the further the curve would be shifted outwards to the right. Hence, if dispersion was negatively correlated with the rate of change ofunemployment, this would give the appearance of anticlockwise loops in the aggregate relation and account for the negative coefficient on the rate of change variable in the equation. (1960, pp. 17-19). This hypothesis was rejected by Smythe who calculated a dispersion variable from the component series of the unemployment index and found these to be positively but not significantly correlated with the rate of change of aggregate unemployment (1979, p. 231). Thus the mystery of the loops remains although Desai (1975) has argued that the rate of change of unemployment is not an independent variable but is determined as part of a dynamic system by the level of unemployment and the rate of wage change[1].

Phillips did not include a price term in his equation though he suggested that if import prices rose unusually sharply, this might be reflected in wage bargaining or the cost of living (1958, p. 284). Lipsey included the rate of change of the cost of living index directly in the equation but this added little explanatory power to the equation, giving a coefficient of 0.21 (1960, p. 10). Other putative determinants

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[1] Desai suggested that Phillips' procedure in estimating the equation implies that he saw the relation as part of a system of differential equations. Grouping the observations by level of unemployment so that, on average, the rate of change of unemployment would be approximately zero, was, therefore, a means of abstracting from short run dynamics. Gilbert (1976) has argued that Phillips' method was just a relatively simple way of fitting a non linear function before it was possible to do this by computer.

of money wage change for 1861 - 1913 have received little support from the data. Kaldor suggested that Phillips' results arose from a spurious correlation between unemployment and profits and that causality ran from high profit levels to high wage increases since high profit levels both increased the bargaining strength of labour and weakened it for employers (1959, p. 292). This was subsequently rejected by Lipsey and Steuer (1961) who could find no evidence of an independent effect for profits. As noted earlier, Hines (1964) found only weak support for trade union militancy as a determinant of wage change before 1914, as compared with later periods.

Though this enquiry is thought to have begun with the work of Phillips in 1958, attention has been drawn to the fact that it was raised as early as 1926 by Irving Fisher who found that for monthly U.S. data the volume of trade was highly correlated with a distributed lag of wholesale price changes from 1903 to 1925 and with a lower correlation on quarterly data from 1877 to 1899. Discussing the nature of the relationship, Fisher stated that "it seems reasonable to conclude that what the charts show is largely, if not mostly, a genuine causal relationship; that the ups and downs of employment are the effects, in large measure, of the rises and falls of prices, due in turn to inflation and deflation of money and credit" (1926, p. 792)[1]. In his book published a year later, Pigou examined the relationship put forward by Fisher for year to year changes in the Sauerbeck price index and the Trade Union unemployment series from 1870 to 1913. Pigou did not find the lags adduced by Fisher but a more or less contemporaneous negative relationship between unemployment and the percentage increase in price over the previous year. He accepted this as "persuasive" evidence but denied that the relationship was truly a causal

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[1] Full details of the relationship, including the novel technique of using distributed lags, was given in an earlier paper (Fisher, 1925).

one (1929, p. 217)[1]. Fisher's explanation for the relationship was that costs of production tended to rise and fall less rapidly than output prices leading to increased profits at times of inflation (1926, p. 498). Pigou's analysis, nevertheless followed along similar lines but he emphasised that the effect of actual price changes was to cause changes in expectations but this depended "on the circumstance that prices are not merely imperfectly but also unequally foreseen" (1929, p. 178). There is a striking resemblance, at least superficially, between the relations discussed by Fisher and Pigou and new classicial macroeconomic models in which unexpected price changes deriving from changes in the rate of monetary expansion, give rise to fluctuations in the level of economic activity (Sargent, 1976; Barro, 1976)

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[1] In characteristic style Pigou argued that "It is necessary, however, to bear in mind the distinction between causes and channels along which causes act. In modern mountaineering, there is an almost perfect correlation between the possession of an ice axe and the ascent of snow mountains; but this does not prove that, if the purchase of ice axes were prohibited by law, snow mountains would no longer be ascended. It does not prove that the existence of ice axes substantially increases the numbers of ascents that are made" (1929, p. 217).

3.2 "Natural Rate" Models of Labour Supply

In Lucas and Rapping's framework, the household is assumed to maximise utility V according to the utility function

$$V = V(\bar{C}, \bar{C}^*, \bar{N}, \bar{N}^*), \; V_1, V_2 > 0, \; V_3, V_4 < 0 \tag{3.1}$$

where $\bar{C}$ and $\bar{N}$ are current values of consumption and labour supply and $\bar{C}^*$ and $\bar{N}^*$ are expected future or normal values of these respectively. This is maximised subject to the budget constraint

$$P\bar{C} + \frac{P^*}{(1+r)}\bar{C}^* \leq \bar{A} + W\bar{N} + \frac{W^*}{(1+r)}\bar{N}^* \tag{3.2}$$

where P and W are the price and wage level, A is initial assets and r the interest rate representing the rate at which current and future income can be exchanged. The normal or expected price and wage levels are conditioned on information up to and including time t such that e.g. $W_t^* = E_t(W_{t+1}/I_t)$ where I_t is the information set available at t which includes W_t. Assuming homogeneity of degree zero in each of the arguments, this leads to a supply function for current labour of the form

$$\bar{N} = F\left(\frac{W}{P}, \frac{W^*}{P(1+r)}, 1, \frac{P^*}{P(1+r)}, \frac{A}{P}\right) \tag{3.3}$$

Taking a logarithmic approximation normalised by the number of households or individuals, M gives

$$\ln\frac{N_t}{M_t} = \beta_o + \beta_1 \ln\left(\frac{W_t}{P_t}\right) - \beta_2 \ln\left(\frac{W_t^*}{P_t^*}\right) + \beta_3\left[r_t - \ln\left(\frac{P_t^*}{P_t}\right)\right] - \beta_4 \ln\left(\frac{A_t}{P_t M_t}\right) \tag{3.4}$$

where β_1, β_2, β_3 and β_4 are expected to be positive.

Normal labour supply follows the same form but is only a function of normal or permanent variables. If actual values of changes in wages and prices were those anticipated for the future in the previous period such that $W_t = W^*_{t-1}$, then actual supply is at its normal level and 3.4 becomes

$$\ln \frac{N^*_t}{M_t} = \beta_o + \beta_1 \ln(\frac{W^*_{t-1}}{P^*_{t-1}}) - \beta_2 \ln(\frac{W^*_t}{P^*_t}) + \beta_3 \left[r_t - \ln(\frac{P^*_t}{P_{t-1}}) \right] - \beta_4 \ln(\frac{A_t}{P^*_{t-1} M_t}) \tag{3.5}$$

subtracting 3.5 from 3.4 gives an expression for the log of the ratio of actual to normal labour supply

$$\ln(\frac{N_t}{N^*_t}) = \beta_1 \left[\ln(\frac{W_t}{P_t}) - \ln(\frac{W^*_{t-1}}{P^*_{t-1}}) \right] + (\beta_3 + \beta_4) \ln(\frac{P_t}{P^*_{t-1}}) \tag{3.6}$$

or alternatively

$$\ln(\frac{N_t}{N^*_t}) = \beta_1 \ln(\frac{W_t}{W^*_{t-1}}) + \beta'_2 \ln(\frac{P_t}{P^*_{t-1}}) \tag{3.7}$$

where $\beta'_2 = \beta_3 + \beta_4 - \beta_1$ and thus if asset effects do not outweigh the intertemporal substitution effect in labour supply, β'_2 will be negative.

Normal labour supply may be regarded as some fraction of the labour force which represents the natural rate of employment. Given continuous market clearing, actual labour supply is equal to employment, the equation can be written in terms of the employment rate

$$\ln(\frac{E}{L})_t = \beta'_o + \beta_1 \ln(\frac{W_t}{W^*_{t-1}}) + \beta'_2 \ln(\frac{P_t}{P^*_{t-1}}) \tag{3.8}$$

where β'_o is the log of the natural rate of employment. Alternatively, following Lucas and Rapping, the unemployment rate may be used in a

functional form where

$$\ln U_t = g_o + g_1 \ln(\frac{N_t}{N^*_t}) \tag{3.9}$$

where g_o is the log of the natural rate of unemployment and g_1 is negative[1] giving

$$\ln U_t - g_o + g_1\beta_1 \ln(\frac{W_t}{W^*_{t-1}}) + \beta_2' \ln(\frac{P_t}{P^*_{t-1}}) \tag{3.10}$$

To make the model operational in observed variables, Lucas and Rapping used adaptive expectations to form the generating mechanism for W^*_t and P^*_t

$$\frac{W^*_t}{W^*_{t-1}} = \left(\frac{W_t}{W^*_{t-1}}\right)^{\lambda} \tag{3.11}$$

in logs this gives

$$\ln W^*_t = \lambda \ln W_t + (1-\lambda)\ln W^*_{t-1} \tag{3.12}$$

where λ is the adaptive parameter, $0 > \lambda > 1$, which is assumed to be the same for both prices and wages rates . Substituting this into 3.8 and 3.9 respectively and applying the Koyk transformation gives

$$\ln(\frac{E}{L})_t = \lambda\beta_o + \beta_1 \ln(\frac{W_t}{W_{t-1}}) + \beta_2' \ln(\frac{P_t}{P_{t-1}}) + (1-\lambda) \ln(\frac{E}{L})_{t-1} \tag{3.13}$$

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[1] In Lucas and Rapping's case the ratio of actual to permanent labour supply was inverted and the absolute value of the unemployment rate was used to give the function

$$U_t = g_o + g_1 \ln(\frac{N^*_t}{N_t})$$

where g_1 is now positive.

[2] Lucas and Rapping also included a constant term which was intended to capture any fully anticipated secular change in wage rates and prices. Though this would potentially shift as trends became anticipated, no allowance was made for this in the subsequent analysis.

$$\ln U_t = \lambda g_o + g_1\beta_1 \ln(\frac{W_t}{W_{t-1}}) + g_1\beta_2' \ln(\frac{P_t}{P_{t-1}}) + (1-\lambda) \ln U_{t-1} \qquad (3.14)$$

Since the labour market always clears in this approach the justification given for variations in the unemployment rate as distinct from the absolute value of employment is that initially the worker cannot distinguish between a change in the wage rate specific to him or his local market and that in wage rates in general. He is therefore induced at least temporarily to engage in job search over different markets. This approach was developed more fully into an aggregate supply function by Lucas (1973, 1976) and yields labour supply equations which are, at least, structurally different from 3.13 and 3.14 and which leads to a different interpretation of the coefficients.

This can be set out in a framework similar to that of Lucas and Rapping by writing the equations in terms of wages and labour supply rather than output and prices. The logarithm of the transitory component in labour supply which is analogous to equation 3.6 is written for the individual micro labour market, z, as

$$\ln n_t(z) = \gamma\left[\ln W_t(z) - E(W_t/I_t(z))\right] \qquad (3.15)$$

$\ln W_t(z)$ is the wage in market z at t which is known to the individuals in that market and $E(\ln W_t/I_t(z))$ is the expectation of the mean of the distribution of wage rates over z conditioned on current information at t. This includes $W_t(z)$ and an estimate of its variance τ^2 over individual markets. If z is taken to index markets by percentage deviations, the local wage can be written

$$\ln W_t(z) = \ln W_t + z \qquad (3.16)$$

where $\ln W_t$ is the economy wide (geometric) average wage. An expectation of this, $\ln \bar{W}_t$, is, in turn, formed with variance σ^2 on the basis of past history up to t-1 and based on these two information components, the expected wage in market z is

$$E(\ln W_t / I_t(z)) = E\left[\ln W_t \middle| (\ln W_t(z),\ \ln \bar{W}_t)\right] = (1-\theta)\ln W_t(z) + \theta \ln \bar{W}_t \qquad (3.17)$$

where $\theta = \tau^2/(\sigma^2 + \tau^2)$. Substituting 3.17 into 3.15 gives

$$\ln n_t(z) = \gamma\left[\ln W_t(z) - (1-\theta)\ln W_t(z) + \theta \ln \bar{W}_t\right] \qquad (3.18)$$

$$= \gamma\theta\left[\ln W_t(z) - \ln \bar{W}_t\right]$$

Since in this framework workers are assumed to form expectations based on available information which are unbiased, though generally in inaccurate because of incomplete information, the adaptive expectations mechanism will not, in general, be appropriate for generating $\ln \bar{W}_t$. This will only be the case if the underlying process generating observations on the national wage takes the form of a weighted average of past observations with geometrically declining weights . In a later section the hypothesis of rational expectations is examined directly but, for the present, it will be assumed that the adaptive process is an adequate characterisation for the formation of $\bar{W}_t$.[1] The wage is thought of as being generated by the following:

$$\ln W_t = \sum_{i=o}^{\infty} \lambda(1-\lambda)^i \ln W_{t-i-1} + v_t \qquad (3.19)$$

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[1] Though the model was developed in the context of rational expectations, Lucas included a lagged dependent variable in the supply function to account for "persistence". This was justified by reference to Lucas and Rapping who obtained the lagged dependent variable in their equation as shown above, through using adaptive expectations (Lucas, 1973, p. 329, Note 3).

Thus v_t is the forecast error distributed with mean zero and variance σ^2. Thus

$$\ln \bar{W}_t = \sum_{i=o}^{\infty} \lambda(1-\lambda)^i \ln W_{t-i-1} = \ln W_t - v_t \tag{3.20}$$

substituting into (3.18) and applying the Koyk transformation gives

$$\ln n_t(z) = \gamma\theta\left[\ln W_t(z) - (1-\lambda)\ln W_{t-1}(z) - \lambda \ln W_{t-1}\right] + (1-\lambda) \ln n_{t-1} \tag{3.21}$$

Aggregating over all markets z gives

$$\ln n_t = \gamma\theta\left[\ln W_t - \ln W_{t-1}\right] + (1-\lambda) \ln n_{t-1} \tag{3.22}$$

The employment rate can be assumed to be composed of permanent and transitory components such that

$$\ln\left(\frac{E}{L}\right)_t = \ln M_t + \ln n_t \tag{3.23}$$

where $\ln M_t$ is assumed constant through time and hence substituting into (3.23) gives

$$\ln\left(\frac{E}{L}\right)_t = \lambda \ln M + \lambda\theta\left[\ln W_t - \ln W_{t-1}\right] + (1-\lambda) \ln\left(\frac{E}{L}\right)_{t-1} \tag{3.24}$$

Alternatively if n_t is related to the unemployment rate by

$$\ln U_t = g_o + g_1 \ln n_t \tag{3.25}$$

then on substituting

$$\ln U_t = \lambda g_o + g_1 \gamma\theta\left[\ln W_t - \ln W_{t-1}\right] + (1 - \lambda)\ln U_{t-1} \tag{3.26}$$

In equations (3.24) and (3.26) the slope of the labour supply function depends on both the slope of the underlying supply function γ and the term θ. The latter approaches zero as τ^2 approaches zero and unity as

σ^2 approaches zero. Thus, as the cross sectional variance of wage rates declines, it more closely approximates to the national wage and the expectational error is reduced and the slope of the supply function declines. If, on the other hand, as the time series variance σ^2 becomes small, then the difference between the national and local wage is more accurately predicted. This model may be modified to include a price term giving a real wage variant. In this case workers are assumed also to be searching as consumers across different product markets. In this case, price terms would enter the equation exactly analogous to the wage terms. Thus augmented versions of the model would be

$$\ln\left(\frac{E}{L}\right)_t = \lambda \ln M + \gamma_1\theta_1 \Delta\ln W_t + \gamma_2\theta_2 \Delta\ln P_t + (1-\lambda) \ln\left(\frac{E}{L}\right)_{t-1} \qquad (3.27)$$

$$\ln U_t = \lambda g_o + g_1\gamma_1\theta_1 \Delta\ln W_t + g_1\gamma_2\theta_2 \Delta\ln P_t + (1-\lambda) \ln U_{t-1} \qquad (3.28)$$

If labour supply is invariant to equal and opposite proportionate changes in wages and prices, then $\gamma_2 = -\gamma_1$. The parameter θ_2 representing cross sectional and time series variations in prices will not be the same as θ_1 even though it is implicitly assumed that wages and prices are generated by the same process[1]. If there are unified product markets with no stochastic spatial price differences, then θ_2 goes to zero and the price term drops out.

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[1] This has been assumed in order to obtain a model with the common adjustment parameter λ as with the Lucas and Rapping model.

3.3 Estimating Natural Rate Models

In this section we turn to estimating the models specified in the previous section on annual data for the period 1855 to 1913. Since this is a period of 59 years, in which considerable development of the economic structure and institutions took place, it is possible that the structure of the model will have changed over the period. The economic historiography of the period often divides up into three phases which might be termed "the Mid Victorian Boom", the "Great Depression" and "Edwardian Retardation". These periods are traditionally marked off at 1873 and 1896 and have been widely used over many years as reference points for the discussion of growth and fluctuations (see for instance Rostow (1948), Crouzet, (1981)). As far as the labour market is concerned, Hobsbawm has argued that "the development of the labour movement falls into much the same periods" (1964, p. 318).

Several writers have argued in separate studies of these periods that, although the Great Depression is traditionally marked out as a period of depressed trade compared with the adjacent periods, the periods cannot be clearly dissected either in the pattern of fluctuations or structural change (Saul 1969, Church 1975). Even if they do not mark fundamentally different phases in the development of the economy, they are marked out by different trends in wages and prices which, as was pointed out in Chapter 2, gave rise to different rates of growth of real wages. This suggests that such a division would be useful in testing models for structural breaks. The period is therefore divided into three segments choosing a periodisation which slightly attenuates the Great Depression in order to give periods equal in length. These are 1855 - 1874, 1875 - 1894 and 1895 - 1913. From Figure 2.1, it can be seen that the first contains

three full cycles of unemployment beginning near the peak of a boom and ending mid way through the downswing. The second phase marks out two and a half cycles with three sharp peaks in unemployment and ending in the recovery. The final period covers the milder and more uneven fluctuations leading to the peak of activity in 1913. The average unemployment rates for the three periods are 3.6%, 5.5% and 3.8% respectively indicating a somewhat higher average rate during the Great Depression than in the other two periods.

The data used in estimation is that discussed previously in Chapter 2 and drawn from Feinstein (1972). The Trade union unemployment series, it will be recalled, is the adjusted series to 1880 and the unadjusted series thereafter. The wage rate series was preferred to that for earnings because, although it has fixed weights, it does not depend on an adjustment for activity using the unemployment series. For prices two alternatives, the GDP deflator (P) which is the most general index, and the cost of living (retail price) index (C) are used. The GDP deflator only extends back to 1870 and for observations before this, it was extrapolated backwards, using the coefficients of a regression on four other price series for the period 1870 to 1913[1].

A variety of equations were estimated based on equations (3.13) and (3.14) or alternatively (3.25) and (3.26). Initially the equation was tried with both a wage and a price term and then with wage and price terms separately. The results for the employment rate and the unemployment

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[1] The four series were the cost of living index C already mentioned, indices for import prices (P_M) and Export prices (P_X) given by Imlah (1959) Table 8, pp 94-98 and the Rousseaux index of the prices of Principal Industrial Products P_i given in Mitchell and Deane (1962), p. 471. The equation estimated was logarithmic and included a time trend. This gave the following coefficients which were used as weights in generating the composite price series for 1855 - 1869

$$\ln P = 1.8 + 0.0016TIME - 0.261 \ln P_M + 0.461 \ln P_X + 0.441 \ln C - 0.051 \ln P_i$$

rate are given in Table 3.1 for the whole period. The striking aspect of these equations is how much of the variation in these rates can be explained without reference to quantity variables such as output. In the presence of a lagged dependent variable, the DW statistic is biased and as an alternative, Durbin's h is given below it in the table. This indicates that only when wage change is omitted from the equation, do the equations fail to reject serial correlation. The wage change term always gives the expected sign and is highly significant but the price terms tend to give the wrong sign. The cost of living index was included to be consistent with the Lucas and Rapping model where consumer prices are featured and the significance of this coefficient suggests that the asset effects of expected price changes dominate which sheds some doubt on the model, particularly since it is counter to the coefficient estimated by Lucas and Rapping in their own empirical work. One possibility is that the cost of living index is acting as a proxy for output prices but when the GDP deflator is included in either of the equations, it loses significance particularly in the unemployment rate equation where it is clearly dominated by the wage term. Some idea of this effect is gained from the last two equations of each panel where wage change and price change are entered individually. It is clear from the levels of $\bar{R}^2$ that using the price term involves some loss of explanatory power though not a great deal. This and the fact that when both wage and price terms are included, the coefficient on the wage tends to drop by an amount similar to the coefficient on the price term, suggests that prices may be acting as a proxy for imperfectly measured or incompletely perceived wage change[1].

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[1] This possibility is raised, though discounted by Okun (1981, p. 101).

Table 3.1

Dependent Variable $\ln(E/L)_t$

Eq.No.	Const	$\Delta \ln W_t$	$\Delta \ln P_t$	$\Delta \ln C_t$	$\ln(E/L)_{t-1}$	$\bar{R}^2$	RSS	DW/h
1	2.3696	0.3945		0.2261	0.4800	0.5782	0.0140	1.6917
	(0.4111)	(0.1214)		(0.0804)	(0.0902)			1.6923
2	2.3403	0.3959	0.2046		0.4862	0.5386	0.0153	1.6614
	(0.4310)	(0.1471)	(0.1271)		(0.0946)			1.8586
3	2.3888	0.5460			0.4755	0.5253	0.0171	1.7315
	(0.4361)	(0.1154)			(0.0957)			1.4930
4	2.0433		0.4216		0.5518	0.4863	0.0173	1.5145
	(0.4396)		(0.1037)		(0.0964)			2.7237

Dependent Variable $\ln U_t$

	Const	$\Delta \ln W_t$	$\Delta \ln P_t$	$\Delta \ln C_t$	$\ln U_{t-1}$	$\bar{R}^2$	RSS	DW/h
5	0.7231	-11.9269		-3.4866	0.5004	0.6807	5.4602	1.6525
	(0.1208)	(2.4470)		(1.5922)	(0.0801)			1.6705
6	0.7423	-12.5686	-2.3845		0.4964	0.6582	5.8455	1.6752
	(0.1249)	(2.9141)	(2.4867)		(0.0830)			1.5963
7	0.7566	-14.3287			0.4907	0.6587	5.9450	1.6985
	(0.1239)	(2.2616)			(0.0827)			1.4785
8	0.5365		-9.1404		0.6038	0.5488	7.8592	1.4457
	(0.1326)		(2.2189)		(0.0910)			2.9276

The coefficient on the lagged dependent variable is highly significant and appears to be quite stable with a value close to 0.5. This gives an average lag in the adaptive process of two years which is consistent with the results of Lucas and Rapping and others. Using equation 3 the implied parameter of the labour supply function gives a wage elasticity of 1.04. Similarly the natural rate of unemployment can be deduced from the adaptive parameter and the constant term. For equation 3 the point estimate is 3.95% and from equation 7, it is 4.42%. For the other equation similar values are obtained, the equations using the unemployment rate always giving slightly lower values[1].

Each of the equations was estimated over the three sub-periods and the results given in Table 3.2. indicate considerable stability in the coefficients, the wage term is always significant with the expected sign as is the lagged dependent variable. Only the coefficient on the price term appears to be unstable, changing sign in the last period when included with the wage term. The F test for structural stability indicates that the restriction cannot be rejected for any of the equations in Table 3.1 [2].

The parameters of the theoretical model do not really provide testable restrictions other than that the variables are significant with the correct signs. The only restrictions on the structure are that because terms appear as first differences, the current and lagged levels of wage rates or prices should enter with equal and opposite signs. Estimates of this unrestricted form for the alternative dependent

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[1] For the other equations the point estimates are (in numerical order) 4.71, 4.90, 4.52, 4.25, 4.37, 3.87.

[2] The values of $F_{\bar{6},50}$ are very small compared with the critical values. The computed values of F were for equations (5) and (6), 0.574 and 0.718 compared with the critical 5% value of 2.15 and for equations (7) and (8), $F_{6,52}$ is 0.422 and 0.502 compared with the critical value of 2.29.

Table 3.2

Dependent Variable ln U_t

Eq.No.	Const	$\Delta \ln W_t$	$\Delta \ln P_t$	$\Delta \ln C_t$	$\ln U_{t-1}$	$\bar{R}^2$	RSS	DW/h
				1856 - 1874				
1	0.7804 (0.2001)	-13.6954 (3.8165)		-3.9527 (2.4777)	0.4237 (0.1421)	0.7001	1.8362	1.2208 2.1636
2	0.8320 (0.2128)	-15.0043 (4.3837)	-1.7757 (4.1895)		0.4025 (0.1523)	0.6352	2.1224	1.6352 1.0629
3	0.8286 (0.2072)	-15.9152 (3.7214)			0.4037 (0.1483)	0.6712	2.1478	1.6494 1.0014
4	0.5232 (0.2491)		-8.8062 (4.7182)		0.5580 (0.1878)	0.4213	3.7800	1.3759
				1875 - 1894				
5	0.6150 (0.2183)	-10.6922 (5.0624)		-5.7679 (3.3263)	0.5631 (0.1329)	0.6157	1.8855	1.5206 1.3329
6	0.5048 (0.2432)	-7.2441 (6.2000)	-8.6040 (5.0016)		0.6449 (1.4319)	0.6148	1.8902	1.3148 1.9948
7	0.7122 (0.2231)	-14.4119 (4.8485)			0.5534 (0.1404)	0.5704	2.2398	1.3392 1.8983
8	0.3983 (0.2279)		-12.5313 (3.7433)		0.6991 (0.1369)	0.6065	2.0515	1.4255 1.6247

Table 3.2 (cont.)

Eq. No.	Const	$\Delta \ln W_t$	$\Delta \ln P_t$	$\Delta \ln C_t$	$\ln U_{t-1}$	$\bar{R}^2$	RSS	DW/h
				1895 - 1913				
9	0.7515	-10.8146		1.3462	0.4644	0.4474	1.2620	1.9898
	(0.2987)	(5.4401)		(4.0800)	(0.1959)			0.0427
10	0.6698	-13.5378	5.0825		0.5190	0.4665	1.2184	2.1355
	(0.3135)	(6.4042)	(6.3096)		(0.2051)			-0.6850
11	0.7624	-9.8062			0.4613	0.4782	1.2711	2.0033
	0.2886	(4.3732)			(0.1901)			-0.0128
12	0.6398		-4.5654		0.5246	0.3509	1.5814	1.5235
	(0.3455)		(4.805)		(0.2263)			6.2947

variables are given in Table 3.3. In each case for both wages and prices the coefficients on current and lagged terms are individually significant with the expected signs. Furthermore the coefficients are numerically close and similar to those implied by the restricted form and, in other respects, they are little different. In each case the restriction could not be rejected when tested against equation 3, 4, 7 and 8 in Table 3.1. A further test was conducted for the structural stability of the unrestricted equations across the three sub periods. This could not be rejected against the equations of Table 3.3 or against those with the additional restriction in Table 3.1.[1]

The equations estimated in this section give strong support to the natural rate type interpretation of fluctuations in unemployment before 1914. The model is capable of explaining about two-thirds of the variation in the log of the trade union unemployment rate. Furthermore, the coefficients appear to be fairly stable across sub-periods. This provides a different interpretation of the relationship initially explored

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[1] Taking as restriction 1 the equation of Table 3.3 against the comparable estimates in Table 3.1, restriction 2 as the equations over the three subperiods compared with Table 3.3 and as restriction 3 the same equations compared with Table 3.1, the resulting F statistics were as follows

	Restriction		
Equation No in Table 3.3	$1(F_{1,54})$	$2(F_{6,46})$	$3(F_{7,46})$
1	3.713	2.147	2.418
2	0.9529	1.988	1.850
3	1.8468	0.393	0.377
4	1.7442	0.696	0.776
Critical value of F(5%)	4.02	2.32	2.23

Table 3.3

Eqn.No.	Const	$\ln W_t$	$\ln W_{t-1}$	$\ln P_t$	$\ln P_{t-1}$	$\ln(E/L)_{t-1}$	$\bar{R}^2$	RSS	DW/h
				Dependent Variable $\ln(E/L)_t$					
1	2.4081 (0.4457)	0.5432 (0.1168)	-0.5490 (0.1169)			0.4769 (0.0967)	0.5171	0.0160	1.7352 1.4898
2	2.0543 (0.4304)			0.4502 (0.1069)	-0.4018 (0.1051)	0.5011 (0.1069)	0.4880	0.0170	1.5040 3.2580
				Dependent Variable $\ln U_t$					
	Const	$\ln W_t$	$\ln W_{t-1}$	$\ln P_t$	$\ln P_{t-1}$	$\ln U_{t-1}$	$\bar{R}^2$	RSS	D.W./h
3	-0.2929 (1.8817)	-14.2084 (2.2860)	14.4443 (2.2852)			0.4935 (0.0834)	0.6544	5.9108	1.7094 1.4329
4	5.8641 (4.5758)			-9.9000 (2.3060)	8.7466 (2.2375)	0.5416 (0.1053)	0.5517	7.6666	1.4470 3.5225

by Phillips and Lipsey. One of the unresolved problems in that literature - the loops around the curve now disappear. The dynamics introduced by the adaptive expectations, yields estimates with a highly significant term in the lagged unemployment or employment rate. This would be consistent with anti-clockwise loops around a curve relating $\Delta \ln W_t$ to $\ln U_t$ [1]. However, the price term which, from the positive coefficient in the Phillips curve, might have been expected to take a positive sign in the natural rate model fails to do so.

There are a number of possible defects in the simple single equation model and difficulties in interpretation which are taken up in the remainder of this chapter. First the model can only be interpreted as representing labour market equilibrium if it is set in the context of a simultaneous system of supply and demand. Lucas and Rapping estimated supply and demand curves jointly but in Lucas's model where supply of output was considered, the problems of estimating a demand curve were avoided by assuming a unit elastic demand curve. Secondly, the model may be mis-specified if the adaptive expectations mechanism is a poor representation of the true underlying process and, hence, the alternative of rational expectations should be considered [2].

The single equation model has gained widespread application for a variety of different data sets since it was estimated for different

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[1] Using equation (7) in Table 3.1 and rewriting in terms of wage change gives $\Delta \ln W_t = -0.069 \ln U_t - 0.034 \Delta \ln U_{t-1}$. Thus, if the Phillips curve is viewed as the relation between $\Delta \ln W_t$ and $\ln U_t$, given the cyclical nature of the unemployment series, the negative coefficient on $\Delta \ln U_{t-1}$ gives anticlockwise loops around the curve.

[2] It is interesting to note that for the six countries examined by Holden and Peel (1977), a simple adaptive rule for the formation of expectations was found to outperform a rational expectations approach.

countries by Lucas (1973). It has also been used in attempts to measure the effects of unemployment benefits on search unemployment (Holden and Peel, 1977, Pederson, 1981). In the following sections the single equation model is used on data for individual unions in order to try and capture any effects which might have arisen from unions' out of work benefit systems. Estimating the model for individual unions is also important from the point of view of providing support for the model at the disaggregated level .

3.4 Unemployment, Wage Change and Unemployment Benefits

In a recent doctoral thesis, Easton (1978) investigated the causes and effects of variations in poor law expenditures in nineteenth century Britain. Rates of relief were found to be positively related to numbers relieved both indoors and outdoors and, more surprisingly, to the rate of trade union unemployment. As was pointed out in Chapter 2 and as Easton later admitted (1979, p. 328) very few, if any, Trade union members would have turned to the poor law for to do so would be grossly demoralizing. As Harris pointed out "Genuinely unemployed workmen shunned outdoor relief because the labour test was liable to impair their industrial skill and prevented them from looking for work elsewhere. Moreover, the so called "stigma of pauperism" involved more than the loss of the franchise; and even if the ... proposal for the abolition of disenfranchisement had been accepted, it is unlikely that poor relief would even have been acceptable to the bulk of the unemployed"(1972, p. 148-9).

Furthermore, as was mentioned in Chapter 2, the records of trade union unemployment are almost entirely for unions who paid some form of benefit to their members. Hence, most of those recorded as unemployed would have been receiving at least some benefit from their union and would have had very little chance of receiving poor relief even if they had applied for it. If unionists were induced into more unemployment by unemployment benefits, then the relevant variable determining this would be the unions' out of work pay and not the level of poor relief.

It is sometimes suggested that old or inefficient workers were only regularly employed during times of excess labour demand and at

other times survived on out of work benefits as tacit superannuation[1]. Apart from such exceptions, it is doubtful that unions would have allowed members with a preference for leisure to systematically exploit their out of work funds (Beveridge, 1930, p. 124; Chapman, 1908, p. 333). But as the Minority Report of the Poor Law Commission pointed out "the power to draw Out of Work pay may, by its subtle play upon motive, tend insidiously to slacken effort to get another job as quickly as possible and keep the job until it is completed and thus actually lengthen the interval between jobs and, therefore, the amount of unemployment" (Webbs, 1909, p. 182). As previously mentioned, trade union out of work pay was designed explicitly to finance search - in the earlier days at least - and it was from this root that out of work pay for non-travelling workers grew. An unexpected change in the wage might send workers tramping the country to see if things were better elsewhere and the more easily they were able to finance such travels, the more willing they would be to undertake them. The Webbs saw the development of benefit systems as an integral part of union policy for defending the standard rate of wages. Thus if some workers could be kept off the market at times when there was a threat of wage reduction, the conditions for the wage reduction would not appear and unionists would have defended their rate successfully but at the cost of higher unemployment[2]. Thus given the wage, the unemployment rate would be

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[1] This was discussed at some length by Sir Hubert Llewellyn - Smith in his evidence to the Committee on Distress from Want of Employment (1895, Q. 4741, 4747, 4875).

[2] They quote a representative of the Flint Glass Makers in 1850: "Our wages depend on the supply of labour in the market; our interest is therefore to restrict that supply, reduce the surplus, make our unemployed more comfortable, without fear of the morrow - accomplish this and we have command over the surplus of our labour and we need fear no unjust employer", (Webbs, 1898, p. 163).

higher in the presence of unemployment benefits, or alternatively, given the unemployment level, the wage would be higher than otherwise.

The effects of an upward shift in the provision of unemployment benefits can be illustrated by a modification to the diagram given in the lower panel of Figure 3.1

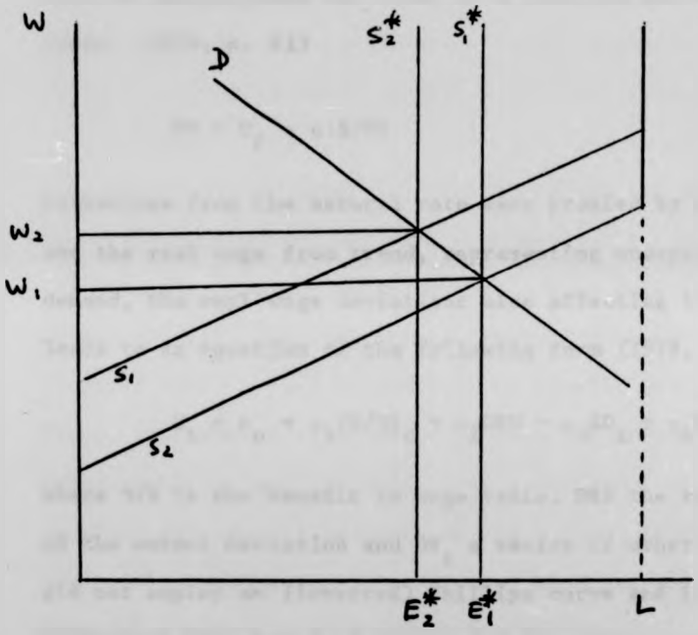

Figure 3.2

Here, unemployment is initially at its equilibrium level determined by the position of the longrun supply curve S_1^*, giving employment E_1^*. The wage is determined by the intersection of the demand, D, curve and the short run supply curve, S_1 which, given that the wage is fully anticipated, is also the intersection with S_1^*. This determines the long run equilibrium and short run wage at $W_1 = W_1^e$. An increase in the benefit rate shifts the long run supply curve to the left and, hence, a new long run equilibrium emerges. The new long run equilibrium

is characterised by an upward shift along the demand curve and a new short run supply curve S_2 which yields the higher equilibrium wage $W_2 = W_2^e$ and lower employment E_2^*. Hence the effect of benefits is to increase the natural rate of unemployment from $L - E_1^*$ to $L - E_2^*$.

In Easton's model which was based on this approach, the natural rate of unemployment was taken as a function of the benefit to wage ratio (1978, p. 91)

$$U^* = U_F + u(B/W) \tag{3.29}$$

Deviations from the natural rate were proxied by deviations of output and the real wage from trend, representing unexpected changes in labour demand, the real wage deviations also affecting labour supply. This leads to an equation of the following form (1978, p. 92)

$$U_t = c_o + c_1(B/W)_t + c_2DRW - c_3AD_t + c_4DV_t \tag{3.30}$$

where B/W is the benefit to wage ratio, DRW the real wage deviation, AD the output deviation and DV_t a vector of other variables. Easton did not employ an (inverted) Phillips curve and it seems likely that deviations from trend of output and the real wage are an arbitrary and perhaps a poor proxy for unexpected deviations. Furthermore, with both output and the real wage as demand variables, the interpretation is not clear. As was pointed out earlier, if firms are in short run equilibrium, both output and employment are simultaneously determined given prevailing wage and price levels. While it might be legitimately suggested that some firms were output constrained or that demand determined output affected the level of labour utilisation, this is not quite in the spirit of the equilibrium model. It would be inter-

preted in the same way as the equations examined in Chapter 2 as disequilibrium[1]. Hence, Easton's model does not adequately capture the spirit of the natural rate model discussed earlier and illustrated in Figure 3.2 for reasons quite apart from the fact that the benefit rates are not appropriate to the case.

Returning to the issue of trade union benefits, the total of such expenditure of reporting unions was recorded in the Board of Trade Reports on Trade Unions together with total membership and the rate of unemployment. Benefits per member for various unions up to 1900 were calculated and presented by Wood (1900) and Hartley (1904). By applying the proportion of the membership unemployed to these figures, a series for benefits per unemployed member can be calculated. It follows from equation (3.29) that the natural rate of unemployment for a union should be positively related to the rate of benefit provided by the union. Though the natural rate cannot be observed directly, it would not be unreasonable to suppose that, over a period of say 20 years, the average observed rate should be close to the natural rate. In the following table, the average weekly payment of benefits and the average unemployment rate are compared for 12 unions for 1871 to 1891.

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[1] Easton argued that there would only be a partial response of the real wage to its new equilibrium value when labour demand or supply shifted, thus admitting disequilibrium into the model. Even in the disequilibrium approach an increase in benefits would tend to affect wages by shifting the S curve of Figure 2.1 to the left, thereby reducing excess demand for a given level of unemployment and shifting up the Phillips curve. This type of effect is considered in more detail with reference to interwar unemployment in Chapter 5. Though Easton admitted partial adjustment of the real wage , he did not provide the wage adjustment equation which would be the counterpart to the natural rate equation in the equilibrium model. His model therefore seems to be a hybrid of equilibrium and disequilibrium.

Table 3.4

Trade Union Benefits and Unemployment 1871-1891

Union	Average % Unemployed	Average Weekly Benefit Payment (shillings)
Amalgamated Society of Engineers	4.02	9.8
Friendly Society of Ironfounders	7.13	7.6
Warehouseman's Philanthropic*	1.63	32.0
London Operative Zinc Workers	2.80	6.2
Associated Blacksmiths	4.45	5.2
London Society of Compositors	2.54	10.4
Amalgamated Carpenters & Joiners	3.49	8.4
Steam Engine Makers	2.63	9.6
Yorkshire Glass Bottle Makers*	5.02	8.4
Bradford Overlookers	0.88	16.6
Amalgamated Tailors	0.39	9.2
Boilermakers and Iron and Steel Shipbuilders**	8.72	3.4

* 1871 - 1890 ** 1873 - 1891

Sources: Calculated from Wood (1899) Table II, p. 641-2,
Wood (1900) Table 3, p. 89-90,
Hartley (1904) Table I, p. 56-9.

These figures do not give any indication of a strong positive relationship between average unemployment and average benefit payment. The two extreme benefit rates, for Warehousemen and Boilermakers appear to suggest an inverse relation but even when these outliers and the Bradford Overlookers with a very low unemployment rate are taken out, there still seems to be no systematic relation between the two sets of figures.

However, this cross sectional comparison is not really an adequate test for two reasons. First, equation 3.29 shows that it is the ratio of benefits to wages which reflects the opportunity cost of unemployment and (though this is doubtful) dividing through by average wage rates paid to different groups might produce different results . A second

problem is that the level of pure frictional unemployment given by the term U_F in equation 3.23 may be different for different trades, reflecting differences in the density of trades and the organisation of the labour market in each. An additional point is that the conditions for benefit varied as between unions. For instance, in some unions, especially in Mining and the Metal Trades, members were eligible (often depending on length of membership) to receive benefits continuously for a year or more while in other cases, eligibility might expire in as few as six weeks (Board of Trade, Report on Trade Unions, 1912, p. xxxv).

Though cross sectional comparisons do not control for these differences, a time series approach is more likely to, since the organisation of labour markets would not be expected to change from year to year and eligibility conditions would be more stable even though the rate of benefit would be changing. But it is still necessary to have the appropriate wage rate in order to obtain a measure of variations over time in the benefit to wage ratio. In the next section, natural rate models which include benefits are estimated for a small group of unions for which wage and unemployment data can be reasonably matched.

The model used is a modified version of (3.27) or (3.28)

$$\ln(E/L) = \ln M + \gamma_1\theta_1(\ln W_t - \ln W_{t-1}) - \gamma_2\theta_2(\ln P_t - \ln P_{t-1}) + (1-\lambda)\ln(E/L)_{t-1} + \lambda\gamma_3 \ln(B/W)_t \tag{3.31}$$

$$\ln U_t = \lambda g_o + g_1 \gamma_1\theta_1(\ln W_t - \ln W_{t-1}) - g_1 \gamma_2\theta_2(\ln P_t - \ln P_{t-1}) + (1-\lambda)\ln U_t + g_1\lambda\gamma_3 \ln(B/W)_t \tag{3.32}$$

It should be noted that, given the model is being applied to smaller aggregations of labour markets, the variance of the local wage rate relative to the national would be different from the aggregate. The slopes of the functions would be expected to differ because of different values of θ if for no other reason[1]. The price term included is the national cost of living index to test for the effects found in the aggregate equations. If the perverse sign on this variable were the result of inadequately matched wage and unemployment series, then it would be expected to disappear when the data are more closely matched. If, on the other hand, workers used price variations as a guide to forming expectations about wages in other markets, then the effect should still be observed and possibly enhanced in the equations for individual unions.

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[1] In the comparisons made by Lucas (1973) across countries, it was this parameter which was assumed to account for the differences in the slopes of the functions and the relation between national variances of price change supported this assumption.

3.5 Estimating Unemployment Functions for Individual Unions

Before moving on to estimating equations such as 3.25 and 3.26 for individual trade unions, several important issues need to be considered. First, data for individual unions is limited in certain respects. It is available for a wide range of unions up to 1891 in the Board of Trade's Reports on Trade Unions[1] but after this, it was only given for major unions and various sub aggregates of the rest. Another important point is that some of the rates were computed from applying rates of benefit to total expenditure on benefits. Hence, any errors or inaccuracy in these computations are likely to distort the true relation between unemployment and benefit rates. The sample was therefore restricted to those unions for which unemployment percentages were computed from actual head counts of the unemployed .

This greatly restricts the scope of possibilities and the choice was further narrowed by the desire to focus on unions which faced relatively fluctuating rates of unemployment and wages. On these grounds the printing unions were ruled out since both unemployment and wage rates varied comparatively little and, therefore, contributed little to the aggregate variation.

This narrows the range down to five unions, four from the metal and engineering trades and one from building. These five are the Associated Society of Engineers (A.S.E.), the Friendly Society of Ironfounders (F.S.I.), the Associated Ironmoulders of Scotland (A.I.S), the United Society of Boilermakers and Iron Shipwrights (U.S.B) and the

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[1] From 1888 most of the unemployed covered in the aggregate figure were counted rather than inferred from benefit payments. The two alternative methods were discussed in British and Foreign Trade and Industrial Conditions (1905), pp. 97-8 where an illustrative comparison was made. The data actually used for the individual unions was taken from the statistical tables on pp. 87-90.

Amalgamated Society of Carpenters and Joiners. It may be recalled that the A.S.E. and A.S.C. were the two leading examples of "new Model" unions in which friendly society benefits were important both individually and collectively from mid century onwards. With the exception of the boilermakers, the average weekly benefit payments were typical among unions of skilled workers as shown in Table 3.4. Hence, if the effects of benefit provisions on unemployment among unionist are to be found at all, it is among this group that they should be sought.

The wage rates roughly appropriate to each of these groups were taken from Bowley and Wood's detailed tables and, in general, the coverage is wider than the membership of the unions involved. This is both because only a fraction of workers in each trade were union members and because in some cases the wage series extend somewhat beyond the trade immediately covered by the union concerned[1]. The benefit per member series were taken from Wood (1900, Table III, p. 89-90) and Hartley (1904, Table I, pp. 55-59) in which the maximum period covered is from 1860 to 1900. The equations estimated are restricted to this period for the A.S.E. F.S.I and A.S.C for the ALS, 1860 - 1896 and for the USB where the unemployment series starts later, 1872 - 1900.

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[1] For the four Metal and Engineering unions, the data was taken from Bowley and Wood (1906), Table 1, pp. 158-161. For the ASE the unweighted average for Fitters, Turners, Smiths, Strikers and Dullers was used. For both F.S.I. and A.S.I. the individual series for iron-moulders was used and for U.B.S. Series D for engineering workers in shipyards was taken. For the A.S.C. the aggregate index for wages in the building trades taken from Bowley and Wood (1901), p. 112, was used.

Table 3.5

(Dependent Variable, ln U_t)

Eq. No.	Union	Const.	$\Delta \ln WR_t$	$\ln WR_t$	$\ln WR_{t-1}$	$\ln U_{t-1}$	$\bar{R}^2$	RSS	D.W./h
1	A.S.E.	0.6426 (0.1126)	-14.8246 (7.0816)			0.6002 (0.0767)	0.7681	4.1333	1.4792 1.8834
2	A.S.E.	3.3471 (2.6422)		-15.2433 (2.1200)	14.6837 (2.0847)	0.5871 (0.0777)	0.7684	4.0162	1.5198 1.7438
3	A.C.J.	0.5678 (0.1374)	-17.4356 (5.8261			0.5430 (0.1003)	0.6183	9.8233	1.2393 3.1112
4	A.C.J.	2.2222 (3.4835)		-17.3428 (5.8556)	17.9775 (5.8934)	0.5165 (0.1061)	0.6145	9.6510	1.2276 3.2935
5	F.S.I.	1.2861 (0.2860)	- 9.8259 (4.3549)			0.3193 (0.1449)	0.1842	18.2602	2.0507 -0.4013
6	F.S.I.	1.4182 (8.6035)		-10.8047 (4.3326)	8.0994 (4.4352)	0.2484 (0.1502)	0.2109	17.1865	2.0310 -0.3138
7	A.I.S	0.8245 (0.2985)	0.0107 (0.0524)			0.6577 (0.1228)	0.4327	8.6516	1.2137 3.4889
8	A.I.S	0.9819 (0.6486)		- 0.0050 (0.0078)	-0.0261 (0.0775)	0.6506 (0.1273)	0.4613	8.6313	1.2022 3.7073
9	U.S.B	0.6901 (0.1683)	-16.9025 (2.6536)			0.7007 (0.0829)	0.7927	5.5010	1.7569 0.7315
10	U.S.B	5.7808 (6.8448)		-17.3853 (2.7542)	16.3419 (2.7807)	0.6961 (0.0838)	0.7891	5.3818	1.7888 0.6373

The first step was to estimate the relationship between wage change and unemployment alone to compare with the results for the basic model presented in section 3.3. The two alternative functional forms given by the use of the employment rate and the unemployment rate were estimated but since the differences were slight, only the latter are presented.

The results given in Table 3.5 indicate that for four of the five unions, the equations are in close conformity with those for the aggregates in Tables 3.1 and 3.3. With the exception of the A.I.S., the coefficients on the wage change terms are significant, in some cases at quite high levels, and give negative coefficients which are of the same order of magnitude and not significantly different from the point estimate for the aggregate, similarly the adjustment coefficients obtained on the lagged dependent variable, though that obtained for the F.S.I. is substantially, though not significantly, lower than the aggregate. These must be treated with caution, however, since both for the A.S.E. and A.C.J. the equations exhibit serial correlation on the criterion of Durbin's h statistic.

When current and lagged wage terms are entered separately, they take the expected opposite signs excepting the A.I.S where both are small and insignificant. It is clear from these coefficients and from the small reductions in the residual sum of squares obtained when the restriction is relaxed, that it cannot be rejected and in each case it fails to be rejected on the F test. Thus, in this respect as well, the equations give support to those estimated for the aggregates.

The rather poorer performance of the equations for the ironfounding unions and especially the A.I.S. is perhaps not surprising when one examines the unemployment figures. Though these conform to the general cyclical

pattern, there are some quite sharp differences in year to year movements between them[1]. Given that the same wage series is used for both (Bowley's national average series for iron moulders) it is not surprising that differences emerge or that the A.I.S. based in Scotland produces relatively poor results.

The next step was to include two other variables, the benefit to wage ratio and the rate of change of the cost of living as supply side variables, into the equation. The former presents some problems in estimation. The original expenditure per member series were deflated by the unemployment rate to obtain benefits per unemployed member. This was originally used in ordinary least squares regressions and the result was uniformly negative but insignificant coefficients. This might reflect the fact that, at times of high unemployment, the current resources of the union had to be spread more thinly over the unemployed members. If, as seems likely, this were the case, then benefit induced unemployment would move inversely with the unemployment rate but if such effects existed, the benefit to wage ratio should still take a positive sign. However, there is the additional problem that any errors in measurement in the unemployment series would lead to negatively correlated measurement errors in the benefit to wage rate and hence, give spurious negative coefficients. To overcome this problem, instrumental variables were used[2]. The instruments used for the benefit series were aggregate

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[1] For instance, both unemployment rates stood at 11.5% in 1880 but, by 1882, the A.I.S was still at 11.0% while the F.S.I. was down to 4.7%. Both rates peaked in the same year 1886 but, while the A.I.S. reached 34.2% the F.S.I. rose only to 14.6%

[2] This problem was also recognised by Easton in the context of Poor Law outdoor relief and he approached the problem in a similar way (1978, p.68)

Table 3.6

Eq. No.	Union	Const	$\ln(B/W_t)$	$\Delta \ln W_t$	$\Delta \ln C_t$	$\ln U_{t-1}$	$\bar{R}^2$	RSS	D.W. /h
	A.S.E	1.0145 (0.3471)	0.2973 (0.2484)	-13.6486 (2.4318)	-3.4878 (2.2023)	0.6384 (0.0906)	0.7422	4.3476	1.3195 2.6260
	A.S.E	0.9748 (0.3502)	0.2518 (0.2494)	-15.2183 (2.2484)		0.6421 (0.0916)	0.7376	4.5507	1.4291 2.2143
	A.C.J	1.0507 (1.2662)	0.3875 (0.9439)	-17.6364 (6.3193)	-5.1567 (2.9711)	0.5439 (0.1027)	0.5999	9.7384	1.3529 2.6913
	A.C.J	0.7077 (1.2513)	0.1045 (0.9302)	-17.6703 (6.3147)		0.5431 (0.1026)	0.6006	9.9994	1.2448 3.1388
	F.S.I	2.0206 (4.8839)	0.3599 (2.3944)	-7.2203 (10.2247)	-2.7964 (5.3557)	0.2762 (0.2589)	-0.2170	25.7676	2.0865 -
	F.S.I	2.2573 (5.1162)	0.4773 (2.5081)	-8.1155 (10.5697)		0.2818 (0.2707)	-0.3317	29.0030	2.1369 -0.5149
	A.I.S	1.7005 (0.5564)	0.3814 (0.2711)	-4.0274 (3.4352)	-6.3905 (3.4598)	0.6868 (0.1472)	0.5257	6.7941	1.2741 3.0190
	A.I.S	1.66198 (0.5771)	0.3863 (0.2814)	-6.9021 (3.1787)		0.7398 (0.1499)	0.4891	7.5554	1.2948 4.8370
	U.S.B	3.2967 (1.2938)	1.0600 (0.5192)	-9.7568 (4.6029)	-6.8319 (4.0323)	0.6302 (0.1090)	0.6755	7.9484	1.4745 1.7474
	U.S.B	2.6710 (1.1715)	0.8059 (0.4694)	-13.4283 (3.7836)		0.6798 (0.1006)	0.6991	7.6776	1.4689 1.7069

output and unemployment benefit expenditure per member and a time trend. While this might be expected to reduce spurious negative correlation, it will tend to introduce independent errors into the series which will tend to bias the estimated coefficient towards zero and this should be borne in mind when inspecting the results.

Table 3.6 reports the results of including both the benefit to wage ratio and the rate of change of the cost of living index. In every case the benefit to wage ratio takes the expected positive sign but only for the U.S.B is the coefficient significant at the 5% level. The other coefficients are not changed greatly when this variable is included but, for the F.S.I., the wage change coefficient loses significance and the values of $\bar{R}^2$ turn negative. On the other hand the wage coefficient for the A.I.S. now takes a negative and significant coefficient. The inclusion of the cost of living index again provides results which are consistent with those obtained for the aggregate. In each case, negative signs appear and in four out of five cases the coefficient is significant at the 5% level. The effect of including this term is to weaken the significance of the wage change coefficient and, in any case, these significance levels tend to be biased upwards since, for three out of five unions, there is still evidence of serial correlation in the equations.

The conclusions to be drawn from Tables 3.5 and 3.6 are necessarily qualified both statistically and because they represent a somewhat select group of unions but the overall impression is of support for the aggregate relation at the disaggregated level. The negative coefficient on the cost of living does not seem to be an artifact of aggregation nor does it appear to reflect deficiencies in the wage series. The evidence for a positive effect of union benefits on unemployment is weak. It would

need a more detailed study of a larger number of unions and some rather stronger results before much confidence could be placed in such a relationship. Hence, while Easton's relationships between Poor Law benefits and trade union unemployment must be rejected out of hand, there may have been a relation between union benefits and unemployment but even this is not strongly substantiated for the few unions examined.

3.6 A Simultaneous Model of Labour Supply and Demand

The findings of the previous sections are consistent with the interpretation of the Phillips curve before 1914 as a labour supply function. The model on which such functions are embedded, typically emphasise equilibrium and market clearing for labour. Thus a convincing model of equilibrium should specify both supply and demand curves for labour in which the employment rate and the wage will be jointly determined. Thus one test of the market clearing approach is that it should be possible to explain the wage rate by the variables determining labour supply and demand.

There are a number of approaches to obtaining short run labour demand curves and the most obvious is to take the marginal productivity condition for labour derived under the postulate of short run profit maximisation under competition. The exact representation of the labour demand curve will depend on the production function chosen. In later chapters on the interwar period a simple Cobb-Douglas is used which has the advantage of being linear in logs in both the production function and the first order condition. For the immediate purposes only the first order condition is required and hence, the C.E.S. production function can be used. This was initially used in the equilibrium framework by Lucas and Rapping and was later applied in a model of disequilibrium labour markets by Rosen and Quandt (1978).

The production function is given by the following expression:

$$Q = \alpha_o \left[\alpha_1 E^{-\alpha_2} + (1-\alpha_1) K^{-\alpha_2} \right]^{\frac{-\alpha_3}{\alpha_2}} e^{\alpha_4 t} \qquad (3.33)$$

where Q = output, E = employment, K = capital stock and t the time trend. α_1 is the share of labour in total output and $\frac{1}{1+\alpha_2} = \sigma$, the elasticity

of factor substitution. α_3 gives the degree of returns to scale and α_4 the rate of constant neutral technical progress. To obtain the first order conditions, it is assumed that the typical firm faces competitive product and labour markets (and hence parametric prices) and that the capital stock in any period is predetermined. This leads to the factor demand function

$$E^* = (\alpha_3\alpha_1)^{\frac{1}{1+\alpha_2}} \alpha_0^{\frac{\alpha_2}{\alpha_3(1+\alpha_2)}} \left(\frac{W}{P}\right)^{\frac{-1}{1+\alpha_2}} Q^{*\frac{\alpha_3+\alpha_2}{\alpha_3(1+\alpha_2)}} e^{\frac{\alpha_4}{\alpha_3(1+\alpha_2)}t} \qquad (3.34)$$

It will be noticed that output appears in this expression which is therefore not a true demand curve since, in profit maximising equilibrium employment and output are jointly determined as functions only of the relevant prices. This functional form is obtained by substituting the maximised value of output, Q* back into the production function to obtain a function which would be linear in logarithms[1]. Thus the model is valid provided it is remembered that output is not exogenous. On aggregating over firms, this employment function can be used to represent the whole economy but for firms in aggregate, wages and prices will not now be fixed and, hence, these are also endogenous variables.

One common feature of employment functions is that firms are assumed to adjust employment only sluggishly to current demand. Using the standard proportional first order adjustment function

$$E_t/E_{t-1} = (E_t^*/E_{t-1})^{\mu} \qquad (3.35)$$

where μ is the adjustment parameter. Substituting in the labour demand function gives

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[1] The true first order condition contains the non-linearity of the production function:

$$\frac{W}{P} = \alpha_3\alpha_1\alpha_0 \left[\alpha_1 E^{-\alpha_2} + (1-\alpha_1)K^{-\alpha_2}\right]^{-\left(\frac{\alpha_3}{\alpha_2}+1\right)} e^{\alpha_4 t} E^{-(\alpha_2+1)}$$

If the production function is plugged back into the expression in the square bracket, the expression of equation (3.25) emerges.

$$E_t = (\alpha_3\alpha_1)^{\frac{\mu\alpha_2}{\alpha_3(1+\alpha_2)}} \left(\frac{W}{P}\right)_t^{\frac{\mu}{(1+\alpha_2)}} Q_t^{*\frac{\mu(\alpha_3+\alpha_2)}{\alpha_3(1+\alpha_2)}} e^{\frac{\mu\alpha_4\alpha_2}{\alpha_3(1+\alpha_2)}} E_{t-1}^{(1-\mu)} \tag{3.36}$$

In order to express the demand function as an employment rate as in the labour supply function, a simple growth trend is taken to represent the labour force

$$L = n_o e^{n_1 t}$$

Combining this with the employment function gives the expression for the employment rate as

$$\left(\frac{E}{L}\right)_t = n_o^{-\mu} e^{-(1-\mu)n_1} (\alpha_3\alpha_1)^{\frac{\mu\alpha_2}{\alpha_3(1+\alpha_2)}} \left(\frac{W}{P}\right)^{\frac{-\mu}{(1+\alpha_2)}} Q^{*\frac{\mu(\alpha_3+\alpha_2)}{\alpha_3(1+\alpha_2)}} e^{\left[\frac{\mu\alpha_4\alpha_2}{\alpha_3(1+\alpha_2)} - \mu n_1\right]_t} \left(\frac{E}{L}\right)_{t-1}^{(1-\mu)} \tag{3.37}$$

Taking logs, the labour demand function can now be written as part of the simultaneous supply and demand system

$$\ln(E/L)_t = a_o + a_1 \ln\left(\frac{W}{P}\right)_t + a_2 \ln Q_t^* + a_3 t + a_4 \ln(E/L)_{t-1} \tag{3.38}$$

$$\ln(E/L)_t = b_o + b_1 \Delta\ln W_t + b_2 \Delta\ln C_t + b_3 \ln(E/L)_{t-1} \tag{3.39}$$

where

$$a_1 = \frac{-\mu}{\alpha_3(1+\alpha_2)}, \quad a_2 = \frac{\mu(\alpha_3+\alpha_2)}{\alpha_3(1+\alpha_2)}, \quad a_3 = \frac{\mu\alpha_4\alpha_2}{\alpha_3(1+\alpha_2)} - \mu n_1$$

$a_4 = 1 - \mu$, and from (3.21) $b_1 = \lambda\gamma_1\theta_1$, $b_2 = \lambda\gamma_2\theta_2$,

$b_3 = 1 - \mu$. a_1 is expected to be negative and is interpreted as $\mu\sigma$ and a_2 positive and a_3 is ambiguous, depending on the growth rates of labour supply and technical progress.

In order to estimate these equations, a number of considerations must be made. First, an output series is needed and, for this, Feinstein's index number of GDP at constant factor cost calculated from the output side was used (1972, Table 6, T18). Secondly, simultaneity must be taken into account and the instrumental variables technique was used. In order to ensure that endogeneity was taken fully into account, instruments were used for the current values of all the variables consisting of one and two period lags of each of the variables in the model[1]. The equations were estimated for the full period 1857 - 1913 and for each of the sub-periods but only the former is reported in Table 3.7. In the employment function of equation 1 the lagged dependent variable does not give the expected sign but is not significant at the 5% level and the time trend also gives the wrong sign, this time significantly. On removing the lagged dependent variable, the equation improves markedly with $\bar{R}^2$ rising but the Durbin Watson statistic is now in the indecisive region. The result is highly encouraging in that all the remaining terms are highly significant with the expected signs. The doubts which surround the amplitude of variations in the trade union unemployment rate mean that the coefficients can only be interpreted cautiously as the parameters of the underlying production function.

The coefficient on the real wage which represents the elasticity of factor substitution gives a value of 0.17 which is rather low compared with other estimates. Using this coefficient, the value of the returns to scale parameter is estimated at 0.93 which is below that often found in

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1 The instrumental variables were all taken in levels, not changes, so that they were, for example, $\ln W_{t-1}$, $\ln W_{t-2}$, $\ln P_{t-1}$, $\ln P_{t-2}$ ... etc.

Table 3.7

Instrumental Variables. Dependent Variable ln(E/L)

Eq. No.	Const	$\ln(W/P)_t$	$\ln Q_t$	t	$\ln(E/L)_{t-1}$	$\bar{R}^2$	RSS	DW
1.	0.7247 (0.4475)	-0.1693 (0.0503)	1.4444 (0.2872)	0.0252 (0.0051)	-0.2848 (0.1946)	0.6047	0.0128	1.6640
2.	0.7654 (0.3565)	-0.1333 (0.0350)	1.0668 (0.1005)	-0.0185 (0.0018)		0.7481	0.0083	1.4339
	Const	$\Delta \ln W_t$	$\Delta \ln C_t$	$\ln(E/L)_{t-1}$		$\bar{R}^2$	RSS	DW
3.	2.5451 (0.4638)	0.6507 (0.3088)	0.0561 (0.2996)	0.4410 (0.1019)		0.5323	0.0154	1.7343
4.	2.5613 (0.4650)	0.6989 (0.1739)		0.4734 (0.1021)		0.5128	0.0163	1.7435

studies of employment[1]. Assuming a value of 1% for the average growth rate of the labour force gives the estimated rate of technical progress as 1.7% which appears rather high[2].

Turning to the labour supply equations, the rate of change of the cost of living index now loses significance in the instrumental estimates and as before, the significance of the wage change term rises sharply when it is removed as shown by equation 4. In its absence the elasticity of labour supply rises to 0.7 in the instrumental variables estimate as compared with 0.55 in the equivalent ordinary least squares equation in Table 3.1. Though the changes in the coefficients are only marginal, the equations now yield a natural rate of unemployment of 5.09% and 5.12% from (3) and (4) respectively. Thus the results for the simultaneous equations model yields an estimate slightly higher than in the ordinary least squares equations.

It was indicated earlier that to have confidence in the market clearing approach one should be able to estimate a convincing equation for the wage rate. Setting the coefficients $a_4 = b_2 = 0$, the reduced form equations can be obtained from the structural equations to give the following.

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[1] In their estimates for the U.S. Lucas and Rapping and Rosen and Quandt obtained values of the elasticity of substitution of 1.09 and 0.984 respectively. These are so close to unity that the estimated production function is close to being Cobb Douglas. Lucas and Rapping constrained their equation to give constant returns to scale but Rosen and Quandt estimated a value of only 0.114. This contrasts with the widespread finding of increasing returns to labour and increasing returns to scale frequently found in studies of employment which are discussed more fully in Chapter 6.

[2] Most calculations of the growth rate of total factor productivity indicate a rate of below 1% for the period 1856-1913. Matthews, for instance, gives figures of 0.9% for 1856-1899 and 0.02% for 1899-1913. (1964, p. 81).

$$\ln(E/L)_t = \frac{b_o a_1 - b_1 a_o}{a_1 - b_1} + \frac{b_1 a_1}{a_1 - b_1} \ln P_t - \frac{b_1 a_1}{a_1 - b_1} \ln W_{t-1}$$

$$- \frac{b_1 a_1}{a_1 - b_1} \ln Q_t - \frac{b_1 a_3}{a_1 - b_1} t + \frac{b_3 a_1}{a_1 - b_1} \ln(E/L)_{t-1} \qquad (3.40)$$

$$\ln W_t = \frac{b_o - a_o}{a_1 - b_1} + \frac{a_1}{a_1 - b_1} \ln P_t \quad \frac{-b_1}{a_1 - b_1} \ln W_{t-1}$$

$$- \frac{a_2}{a_1 - b_1} \ln Q \frac{-a_3}{a_1 - b_1} + \frac{b_3}{a_1 - b_1} \ln(E/L)_{t-1} \qquad (3.41)$$

These equations are not true reduced forms since as already indicated, P_t and Q_t will also be jointly dependent variables. In equation 3.38 there is a restriction on the coefficients of $\ln P_t$ and $\ln W_{t-1}$ to be equal and opposite in sign. Similarly in equation 3.39, the restriction is that the coefficients on these terms add up to one. In Table 3.8 the unrestricted estimates are given but the restrictions were tested and could not be rejected over the whole sample[1]. In the employment rate equation (1) both the time trend and the lagged dependent variable give the wrong sign as was the case when the latter was included in the structural equation but, as before, it is not significant. In the wage equation, however, all variables give the expected sign and are significant and the equation as a whole gives a high level of explanatory power. This gives strong support to the market clearing model but, since the cross equations restrictions have not been applied, unique values for the underlying parameters cannot be obtained[2].

The remaining part of the table shows the equations estimated over the three sub-periods. Though the coefficients are less well determined, with

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[1] The computed F values were for the employment and wage equations respectively 0.526 and 1.805 compared with the critical value of $F_{1,51}$ at 5% of 4.04. There are also cross equation restrictions on the other coefficients but these were not tested.

[2] The coefficients a_1 and b_1 can be calculated and give values of -0.2159 and 0.7209 respectively which appear to be reasonable even without the cross equation restrictions.

Table 3.8

Eq. No.	Dependent Variable	Const	$\ln P_t$	$\ln W_{t-1}$	$\ln Q_t$	t	$\ln (E/L)_{t-1}$	$\bar{R}^2$	RSS	DW
					1857-1913					
1.	$\ln(E/L)_t$	1.0443	0.1242	-0.1554	1.2496	0.0218	-0.1723	0.6930	0.0097	1.5933
		(0.3837)	(0.0432)	(0.0465)	(0.2299)	(0.0041)	(0.1673)			
2.	$\ln W_t$	1.6951	0.1543	0.7430	1.1873	-0.0200	-0.4582	0.9586	0.0226	1.7867
		(0.6583)	(0.6586)	(0.0709)	(0.3507)	(0.0063)	(0.2551)			
					1857-1874					
3.	$\ln(E/L)_t$	0.7696	0.2731	-0.1355	1.4047	-0.0265	-0.3954	0.5675	0.0025	2.5435
		(0.9200)	(0.1536)	(0.1146)	(0.3437)	(0.0073)	(0.3087)			
4.	$\ln W_t$	-1.9806	0.2807	0.5264	0.7510	-0.0079	0.0075	0.9868	0.0014	1.7672
		(0.6713)	(0.1129)	(0.0842)	(0.2526)	(0.0054)	(0.0022)			
					1875-1894					
5.	$\ln(E/L)_t$	0.5530	0.0111	0.1338	1.0503	-0.0185	-0.0793	0.8262	0.0022	1.6519
		(0.0067)	(0.3926)	(0.2591)	(0.2749)	(0.0069)	(0.0174)			
6.	$\ln W_t$	0.4086	0.2537	0.9255	0.5238	-0.0092	0.0069	0.8608	0.0020	2.2332
		(0.5772)	(0.3735)	(0.2465)	(0.2615)	(0.0066)	(0.1660)			

Table 3.8 (cont)

Eq. No.	Dependent Variable	Const	$\ln P_t$	$\ln W_{t-1}$	$\ln Q_t$	t	$\ln(E/L)_{t-1}$	$\bar{R}^2$	RSS	DW
					1895-1913					
7.	$\ln(E/L)_t$	1.6534 (1.0723)	0.1253 (0.3828)	-0.1687 (0.2905)	1.4498 (0.7948)	-0.0247 (0.0134)	-0.4562 (0.6295)	0.1914	0.0033	1.7727
8.	$\ln W_t$	-1.1865 (0.7196)	0.7182 (0.2569)	0.1013 (0.1949)	0.5841 (0.5334)	-0.0105 (0.0090)	-0.0106 (0.4224)	0.9013	0.0015	1.8919

the exception of the lagged employment rate, all the coefficients but one gave the expected sign. The F statistics calculated for the structural stability of the equations give a surprising result. For the employment rate equation, the computed value was 0.69 and for the wage rate, 11.74 compared with a critical value at the 5% level of 2.0. This suggests either that the structure changed over the period or that the model is somehow misspecified. The most obvious part of the model which may be misspecified is the expectations generating mechanism. The adaptive expectations approach is important in determining the dynamic structure of the equations. Furthermore, as can be seen from the reduced form wage equation, adaptive expectations is inconsistent with the actual wage generating process which emerges when supply and demand are considered jointly. In the next section we turn to an alternative approach, that of incorporating rational expectations.

3.7 Rational Expectations and Causality

Recent developments in theory have emphasised that, unless expectations are formed on the basis of all available (relevant) information, they will, in general, be sub-optimal or irrational[1]. In the standard version of the model, expectations are formed on the basis of knowledge of the underlying process generating wages and/or prices such that forecasts are not systematically wrong. Thus the behavioural expectation at time t conditional on all available information t-1 or earlier, is identical with the statistical expectation which the structure would generate based on that information. Thus, for example:

$$\ln W_t = E\left[\ln W_t | I_{t-1}\right] + \eta t \tag{3.42}$$

where ηt is the forecast error. If ηt is an independent random variable with mean zero and variance σ_η^2 then

$$E\left[\ln W_t - E \ln W_t | I_{t-1}\right] = E\left[\ln W_t | I_{t-1}\right] - E\left[\ln W_t | I_{t-1}\right] = 0 \tag{3.43}$$

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[1] Thus, for example, if the wage were constant from a particular period onwards, then in an adaptive process such as that specified in (3.12) the wage expected at any subsequent time t would eventually catch up with the actual wage at t and would deliver accurate forecasts (since the weights on all past wage rates add up to one). But if wage rates were to rise at a constant rate, the mechanism would systematically under predict the actual wage for all time (since all previous wages are lower than the current, with weights adding up to one, the forecast must be below the actual wage). One alternative would be to postulate, as Lucas and Rapping, (1969, p.733) did, that there is an additional constant in an equation like 3.12 equal to the constant inflation rate. But if inflation were constantly accelerating, then a higher order component would have to be included to generate accurate forecasts. Furthermore, this begs the question of the mechanism by which such growth components become incorporated into expectations.

If, for example this expectation applied to the aggregate wage were substituted into the Lucas supply equation (3.19), it gives

$$\ln n_t = \gamma\theta(\ln W_t - E(\ln W_t) - \eta_t) \qquad (3.44)$$

Thus $\ln n_t$ would simply be an independent random variable with mean zero and variance $(\gamma\theta)^2\sigma^2$. Hence if labour supply is a function only of the transitory or unexpected component of the current wage, it will simply be equal to the long run or normal level plus a random component. This would imply that the unemployment or employment rates should be uncorrelated with their lagged values. It is hardly necessary to test such a hypothesis formally though some equations estimated in the next section can be interpreted as applying such a formal test. In empirical applications, lagged values of employment or unemployment rates are included as was noted earlier on the grounds that there is some persistence in the aggregate time series. This might be due to costs of adjustment or to the costs of acquiring information but the exact structure leading to this persistence is left unclear.

This hypothesis on expectation formation might be implemented with either the Lucas and Rapping supply function where the relevant expectation is of the future wage conditioned on all information up to and including the present or the Lucas supply function where there is complete information from t-1 backwards and incomplete information at t. However, it has been suggested that the Lucas and Rapping framework is less appropriate to rational expectations and the model developed below is is therefore of the Lucas type[1].

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[1] This critique has been developed by Minford and Peel who argue that since, in the Lucas and Rapping framework the current wage is known, there is no point in searching and therefore no rationale for unemployment (1980, p. 75). This seems to apply equally to the version of the model with adaptive expectations. Another point developed by Altonji and Ashenfelter is that if the wage process is a random walk, then in the Lucas and Rapping type framework, unemployment will simply be a constant (in the absence of persistence) whereas in the Lucas function, it will vary stochastically. (1980, p. 219-222).

A function typical of that used in empirical implementations is the following

$$\ln U_t = \partial_o + \partial_1(\ln W_t - E \ln W_t | I_{t-1}) + \sum_{i=1}^{n} \mu_i \ln U_{t-i} + \varepsilon_1 t \qquad (3.45)$$

This is analogous with a modified version of (3.19). $E(\ln W_t | I_t)$ is the rational expectation of W_t and persistence is captured in the term $\sum_{i=1}^{n} \ln U_{t-i}$. Sargent (1973) has pointed out since there are no obvious restrictions on the coefficients and, in any case, the expectation term is unobserved, it is difficult to frame legitimate tests. One test he proposes can be demonstrated by testing the expectation of (3.26) which, from (3.24) is

$$\ln U_t = \partial_o + \partial_1 \eta_t + \sum_{i=1}^{n} \psi_i \ln U_{t-i} + \varepsilon_{1t} \qquad (3.46)$$

Thus the unemployment (or employment) rate can be expressed as a function of its own lagged values plus a random error term $\partial_1 \eta_t + \varepsilon_t$. No other variables dated t - 1 or earlier will enter the model since they can only affect unemployment through the wage rate and this information is already embedded in the (rationally) expected wage term. Thus the test is to include strings of other relevant variables which might be thought to determine U through W. and test the hypothesis that they are jointly insignificantly different from zero. Given that these are predetermined variables (dated t-1) or earlier) they will not be correlated with the error term. Formally the equation to be tested is

$$\ln U_t = \partial_o + \sum_{i=1}^{n} \mu_i \ln U_{t-i} + \sum_{i=1}^{m} \lambda_i Z_{t-i} + \varepsilon_i t \qquad (3.47)$$

where Z is the vector of relevent lagged variables.

As Sargent (1976 p. 217) pointed out in a later paper in which the same test was performed, this procedure is equivalent to a test using Granger's (1969) criterion for causality. This states that (simple) causality exists between X and Y (X causes Y) if past information on X

improves the prediction of Y_t obtained from past values of Y_t alone. This is the criterion also used by Sims who termed it "a sophisticated version of the post hoc ero propter hoc principle" (1972, p. 543). As the phrase implies, this only tests for the independent influence of lagged X on Y_t. If the causal influence of X on Y is instantaneous or within the period of observation, then the direction of causality cannot be distinguished in the absence of more restrictive assumptions about the structure of the relationship.

In addition to the supply equation, one should also consider labour demand. Writing the equation in terms of unemployment, demand is a function of the current wage and also of current and lagged Z

$$\ln U_t = \psi_o + \psi_1 \ln W_t + \sum_{i=0}^{m} \lambda_i' Z_{t-i} + \varepsilon_{2t} \qquad (3.48)$$

Taking equations (3.48) and (3.46) an equation for the wage can be derived by substitution as

$$\ln W_t = \frac{\partial_o - \psi_o}{\psi_1} + \frac{1}{\psi_1} \sum_{i=1}^{n} \mu_i U_{t-1} - \frac{1}{\psi_1} \sum_{i=0}^{m} \lambda_i' Z_{t-1} + \frac{\partial_o \eta_t + \varepsilon_{1t} - \varepsilon_{2t}}{\psi_1}$$

This implies that the wage should be caused by the unemployment rate in addition to the variables determining the demand schedule for labour. It also implies that the rational expectation for the wage is

$$E(\ln W_t | I_{t-1}) = \frac{\partial_o \psi_o}{\psi_1} + \frac{1}{\psi_1} \sum_{i=1}^{n} \mu_i U_{t-1} - \frac{1}{\psi_1} \sum_{i=1}^{m} \lambda_i' Z_{t-i}$$

Substituting this back into (3.45) gives

$$\ln U_t = \partial_o - \partial_1 \frac{(\partial_o - \psi_o)}{\psi_1} + \partial_1 \ln W_t - \frac{\partial_1}{\psi_1} \sum_{i=1}^{m} \lambda_i' Z_{t-i} + 1 - \frac{\partial_1}{\psi_1} \sum_{i=1}^{n} \mu_i U_{t-i} + \varepsilon_{1t}$$

If the set of Z's includes only past observations on ln W_t, then the rational expectation of ln W_t is formed on lagged values of itself and lagged ln U_t and it should be possible to reject the hypothesis that other variables enter Z. In this simple bivariate form, the model can be re-stated as

$$\ln U_t = \partial_o + \sum_{i=1}^{n} \mu_i \ln U_{t-i} + V_{it}$$

$$\ln W_t = \frac{\partial_o - \psi_o}{\psi_1} + \frac{1}{\psi_1} \sum_{i=1}^{n} \mu_i U_{t-i} - \frac{1}{\psi_1} \sum_{i=1}^{m} \lambda_i' \ln W_{t-i} + V_{2t}$$

In order to test these hypotheses, auto regressive functions were estimated for the two key variables, the unemployment rate and the wage rate (in logs). For both series second order lagged coefficients are significant but higher orders are not although including the third lag increases $\bar{R}^2$ in both cases. In Table 3.9 the results are given for the case of up to third order lags of both variables with and without the current value of the independent variable. The pattern of coefficients are of some interest. In the equation for the unemployment rate, the first order lags of both variables are significant together with the current value of the wage rate when it is included. But in the wage rate equation, only current unemployment is significant and lagged unemployment only becomes significant when the current term is excluded.

Two sets of significance tests were conducted. The first is to calculate the sums of the coefficients on each variable and compute the asymptotic standard errors. These are given at the bottom of the table. For regressions on the unemployment rate, the sum of coefficients on the lagged dependent variables are significantly less than one but not significantly greater than zero.while the sums of

Table 3.9

Eq. No.	1	2	3	4
Dependent Variable (Y)	ln U	ln U	ln W	lnW
Independent Variable (X)	ln W	lnW	ln U	ln U
Constant	0.7493 (0.9653)	1.0712 (2.1435)	0.1289 (0.0743)	0.1488 (0.0835)
$\ln Y_{t-1}$	0.7127 (0.1503)	0.8873 (0.1609)	1.1759 (0.1273)	1.2967 (0.1386)
$\ln Y_{t-2}$	-0.3748 (0.1851)	-0.6110 (0.1960)	-0.0437 (0.2019)	-0.1715 (0.2241)
$\ln Y_{t-3}$	0.1557 (0.1292)	0.0971 (0.1443)	-0.1598 (0.1250)	-0.1608 (0.1407)
$\ln X_t$	-12.2308 (3.2600)		-0.0185 (0.0049)	
$\ln X_{t-1}$	9.3445 (5.2798)	-6.5152 (3.5603)	0.0022 (0.0071)	-0.0143 (0.0063)
$\ln X_{t-2}$	4.7978 (5.1434)	6.8957 (5.7548)	0.0080 (0.0074)	0.0193 (0.0076)
$\ln X_{t-3}$	-1.9096 (3.2525)	0.0573 (3.6130)	0.0066 (0.0050)	0.0048 (0.0056)
$\bar{R}^2$	0.6886	0.6055	0.9847	0.9807
RSS	4.8945	6.3298	0.0074	0.0096
DW	1.9612	1.9646	2.1107	2.1141
ΣY	0.4736 (0.2713)	0.3734 (0.2917)	0.9724 (0.2694)	0.9644 (0.2987)
ΣX	0.0019 (8.6913)	0.4378 (7.6713)	-0.0017 (0.0111)	0.0098 (0.0114)
LR	0.0030	0.6987	0.0616	0.2753

of coefficients on the wage rate are close to and not significantly different from zero. When the wage rate is used as the left hand side variable the sums of own lagged coefficients is close to and not significantly different from one while the unemployment rate takes small coefficients which are not significantly different from zero. This supports the view that it is wage changes and unemployment levels that are most important - there is almost no relationship in the long run between the wage level and the unemployment level.

The joint significance of including the other variable in each equation is tested by constructing the appropriate F statistics. These are given for each dependent variable both with and without the current value of the other variable in Table 3.10.

These results are quite striking in that, for simple causality (when the current value of the right hand variable is excluded) the null hypothesis that ln W does not cause ln U cannot be rejected and the result becomes stronger as higher orders of lags are included. By contrast in every case, the null hypothesis that the unemployment rate does not cause the wage rate is rejected though this gets weaker as higher orders of lags are included. For contemporaneous causality when the current value of the right hand variable is included, all the F statistics reject the null hypothesis as might have been expected. It appears from these results that the model of rational expectations is fully supported by the data.

We turn to extending the range of variables entered into each regression in order to test the rational expectations hypothesis further. Three additional variables were used, all of which were used in the structural model of the previous section. These are the GDP deflator (P),

Table 3.10

F Statistics for Causality Tests on Employment, Unemployment and the Wage Rate

L.H.S. Var.	R.H.S. Var	Highest Order Lag 2	3	4
		Simple Causality		
ln U	ln W	2.233	1.566	0.840
ln W	ln U	8.394	7.146	4.500
Critical Value of F 5%		$F_{2,52}$ 3.19	$F_{3,49}$ 2.80	$F_{4,46}$ 2.57
L.H.S. Var	R.H.S. Var	2	3	4
		Contemporaneous Causality		
ln U	ln W	6.085	5.007	3.425
ln W	ln U	11.000	10.378	7.225
Critical Value of F 5%		$F_{3,51}$ 2.80	$F_{4,48}$ 2.57	$F_{5,45}$ 2.43

the cost of living index (C) and the output index (Q). These were included in lags only for both dependent variables with second to fourth order lags . The results for third order lags are given in Table 3.11. It is notable that, in the unemployment equations, the significance of the wage coefficients appears to rise dramatically and there are individually significant coefficients on the price level and output, lagged two periods or more. For the wage rate equation this also extends to the cost of living index.

Two sets of F statistics were calculated. The first given in the upper panel of Table 3.12 is a joint test for the coefficients of all four right hand side variables over the simple autoregression equation with the same order of lags. The exact same result emerges from these results as in the bivariate case in Table 3.9. The unemployment rate is not caused by the set of lagged variables but the wage rate is. This is quite surprising in view of the significance of individual coefficients but strongly supports the rational expectations model.

The second set of F statistics in the lower part of the Table tests the equations with all four right hand variables against the set of equations with just two variables as represented in Table 3.8. These all fail to reject the null hypothesis. Thus adding these additional variables does not add significantly to the causal relationships already examined between the wage and unemployment rates. Each of the causality tests was also performed with the log of the employment rate rather than the unemployment rates and the results were very similar .

It is worth briefly comparing these results with those obtained in other studies. In his earlier tests Sargent (1973, p. 453-3) could not

Table 3.11

Dependent Variable ln U_t

Order of Lag	Constant	ln U	ln W	ln P	ln C	ln Q	$\bar{R}^2$	RSS	DW
t	12.3909 (7.0282)						0.6369	4.7543	2.0966
t-1		0.7826 (0.2120)	-10.2851 (4.2634)	-1.7388 (4.2349)	1.4844 (2.5982)	-1.6035 (3.1222)			
t-2		-0.9687 (0.2507)	13.2138 (6.1222)	-6.3682 (4.4738)	-1.2142 (3.0336)	-5.5287 (3.5684)			
t-3		0.2935 (0.2020)	-5.0647 (4.2161)	6.4814 (3.5167)	2.1340 (2.4927)	8.0337 (3.2246)			
				Dependent Variable ln W_t					
t	0.4198 (0.2660)						0.9832	0.0068	2.2327
t-1		-0.0241 (0.0080)	1.3130 (0.1613)	-0.1483 (0.1603)	0.0143 (0.0983)	-0.1045 (0.1182)			
t-2		0.0374 (0.0095)	-0.1698 (0.2317)	-0.1671 (0.1693)	0.2246 (0.1148)	0.3513 (0.1350)			
t-3		-0.0085 (0.0076)	-0.3048 (0.1595)	0.2914 (0.1331)	-0.1987 (0.0943)	-0.1932 (0.1220)			

Table 3.12

F Statistics for Causability Tests with Additional Variables

LHS Variable	High Order Lag 2	3	4
F Statistics for Tests against Autogressions			
ln U	1.007	1.528	1.692
ln W	3.450	3.431	2.408
Critical Value of F 5%	$F_{8,46}$ 2.16	$F_{12,40}$ 2.00	$F_{16,34}$ 1.95
F Statistics against Wage, Unemployment eqns. (Table 3.7)			
ln U	0.630	1.471	1.384
ln W	1.606	1.830	1.511
Critical Value of F 5%	$F_{6,46}$ 2.37	$F_{9,40}$ 2.12	$F_{12,34}$ 2.05

reject that wages and prices together caused unemployment and found that a larger set of variables, including GNP and the money supply, also improved the prediction of unemployment. In subsequent tests, the wage rate and the money supply were found individually to cause unemployment (1976, p. 226, 233). Thus the joint hypothesis of the natural rate model and rational expectations was decisively rejected. In causality tests for Australian labour market variables, Fels and van Hoa found the wage rate was caused by institutionally set minimum award rates and was, in turn, a causal variable for detrended output (1981, p. 31).

Thus the findings for the British economy before 1914 appear to be more in accord with the simple model based on the rational expectations supply function than evidence from postwar economies. Perhaps it is not surprising that the model produces stronger results when the period under consideration is one in which institutional factors did not have a very significant impact. The labour market was competitive and not affected by either government welfare provisions or by the benefit schemes of trade unions. Furthermore, institutional wage setting was in its infancy and centralised collective bargaining had not yet come to dominate the market in the process of wage setting.

It would be possible to estimate the model incorporating rational expectations jointly with the labour demand function. However, this is unnecessary since the essentials of the process determining wages and unemployment are obtained from the equations in Table 3.7. Because the wage term in the labour supply function is simply white noise, the natural rate of unemployment can be obtained directly from the regressions of unemployment on its own lagged values. The resulting point estimates using two, three and four lags are respectively 3.48%, 3.76% and 3.71%.

These are quite similar to the results for the single equation model with adaptive expectations but lower than those obtained from the simultaneous equations model. However, this appears to be due partly to using the unemployment rate rather than the employment rate since the results for the autoregressive equations for the employment rate yielded estimates of 4.42%, 4.47% and 3.45% respectively.

CHAPTER 4

ECONOMIC AND INSTITUTIONAL CHANGE AND THE LABOUR MARKET IN THE AGE OF MASS UNEMPLOYMENT

4.1 Growth, Structural Change and Economic Fluctuations 1913 - 1938

1913 marked the end of an era in economic history. With the coming of war in 1914 the economy was mobilised as never before in the interests of a single objective. When peace returned in 1918 there was a widespread desire for a "return to normalcy" which implied a return to the conditions existing before the war. This was not to be. Not only had fundamental changes taken place in domestic economic relationships, even more important were changes, many of which were already in progress before the war, altering the distribution of world income and capital and the whole pattern of comparative advantage. The result was that Britain's nineteenth century dominance in international trade and finance was lost and her position became increasingly peripheral and uncertain. To the extent that economic structure and institutions were carried over from Victorian times they are seen as increasingly anachronistic and, where they were not modified to meet the new conditions, they were often a serious impediment to growth and prosperity.

Fig. 4.1 plots the graph of output and industrial production using Feinstains data. Wartime mobilisation which increased the degree and intensity of resource use raised real GDP some 12% over the 1913 level by 1917. At the same time industrial production exclusive of war production declined sharply. The graphs illustrate the sharp decline in activity to 1922 and the subsequent recovery. Adjusting for the break in the series due to the exclusion of Southern Ireland after 1920 the 1913 level of industrial production was exceeded by 1924 but for GDP not permanently until 1927. The sharp dip represented by the general strike is clear in both series though the depression from 1929 - 1932 is more marked in industrial production. The recovery to 1937 is steep and sustained and over the whole period from 1920 the series fluctuates about a strong upward trend.

Fig 4·1

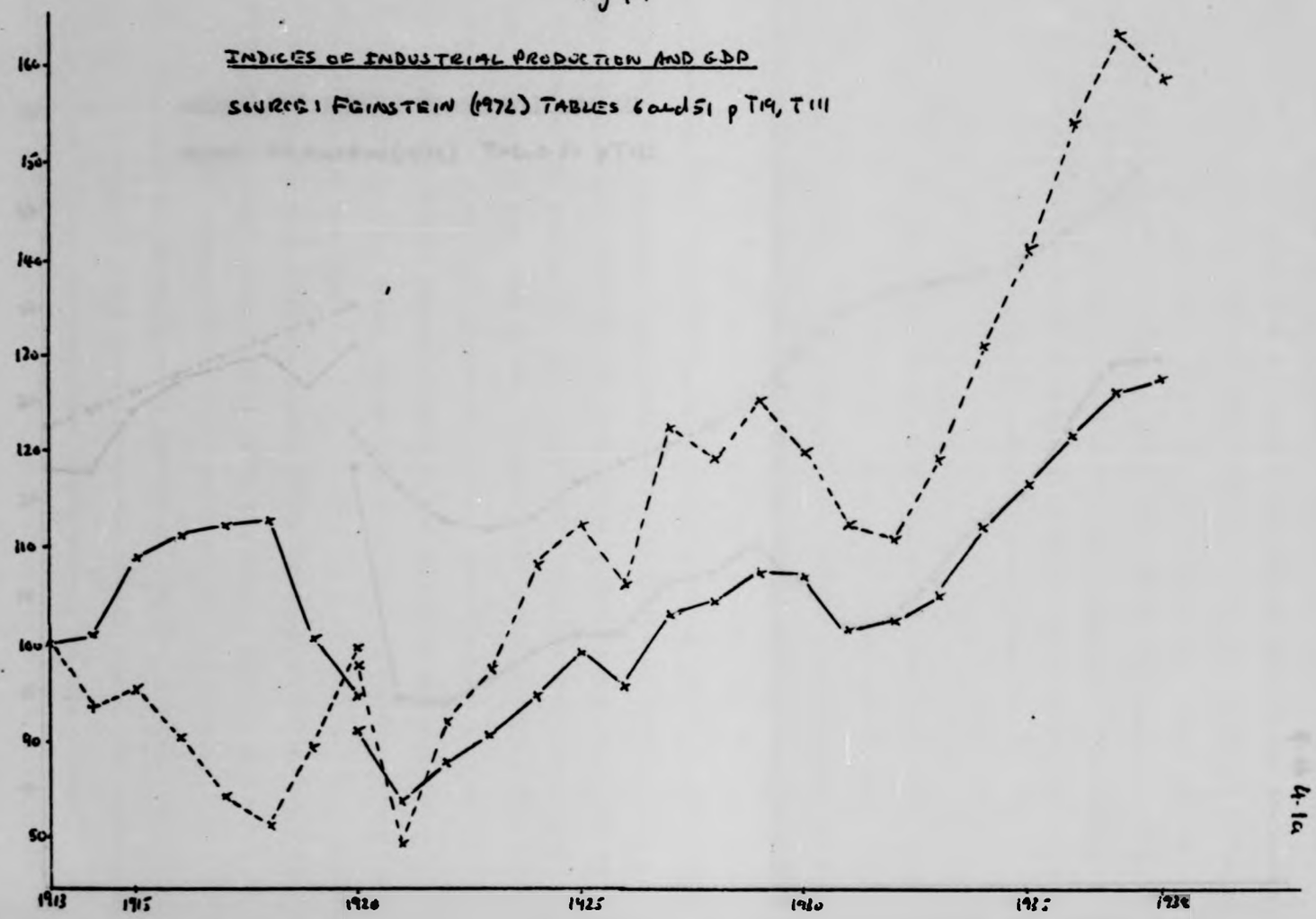
INDICES OF INDUSTRIAL PRODUCTION AND GDP
SOURCE: FEINSTEIN (1972) TABLES 6 and 51 p T19, T111
160
150
140
130
120
110
100
90
80
1913
1915
1920
1925
1930
1935
1938

Fig 4.2

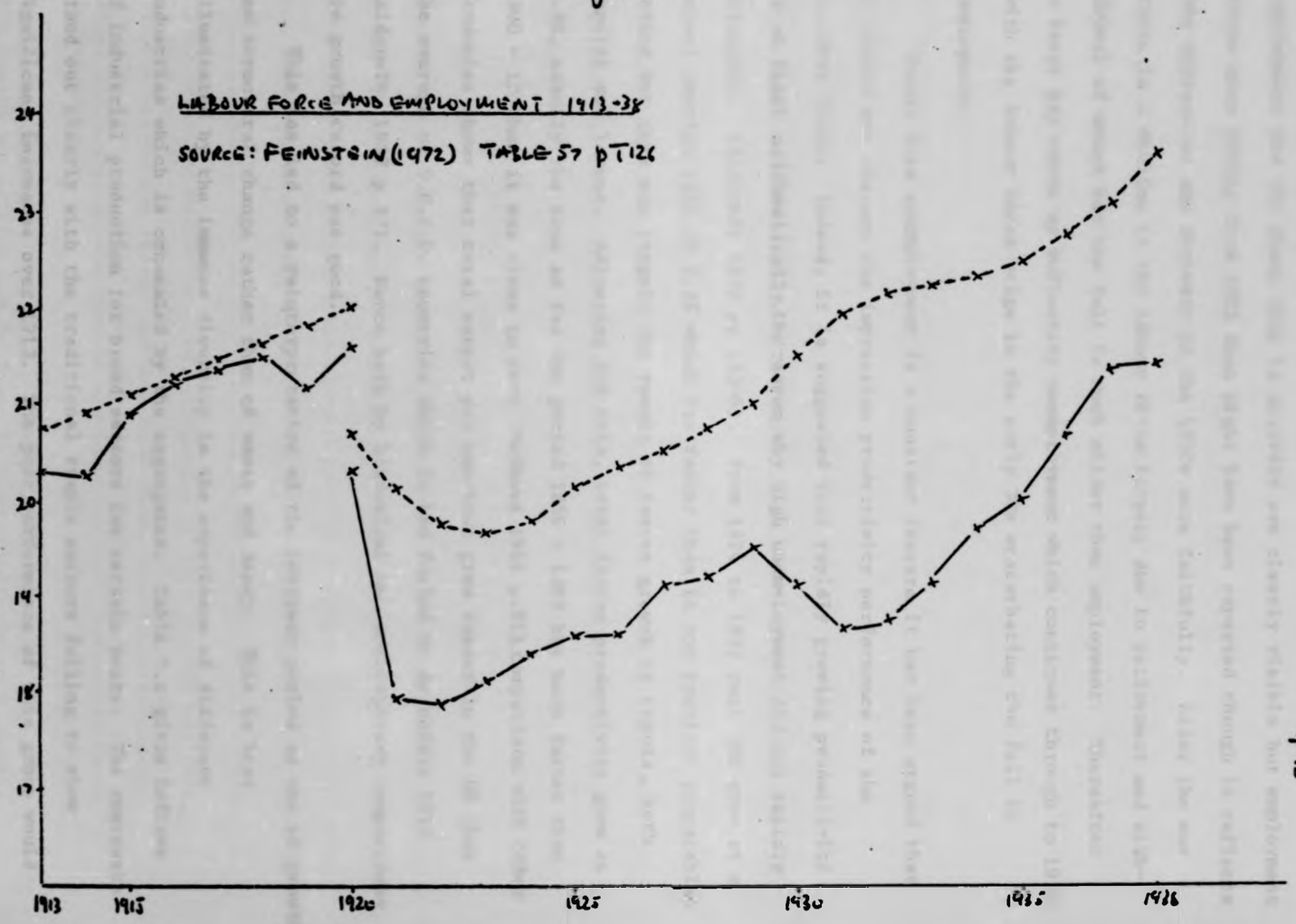
LABOUR FORCE AND EMPLOYMENT 1913-38
SOURCE: FEINSTEIN (1972) TABLE 57 pT126
24
23
22
21
20
19
18
17
1913
1915
1920
1925
1930
1935
1938

Figure 4.2 plots the total labour force and employment. The wartime full employment and the sharp drop in activity are clearly visible but employment rises more slowly from 1922 than might have been expected though it reflects the depression and recovery of the 1930s more faithfully. After the war there is a decline in the labour force largely due to retirement and withdrawal of women but the fall is much milder than employment. Thereafter a large gap opens up reflecting unemployment which continues through to 1938 with the labour force bulge in the early 30s exacerbating the fall in employment.

Though this unemployment is a constant feature, it has been argued that it should not obscure the impressive productivity performance of the interwar years. Indeed, it is suggested that rapidly growing productivity is at least arithmetically the reason why high unemployment did not rapidly disappear. (Aldcroft 1970 pp 133-6). From 1924 to 1937 real GDP grew at an annual average rate of 2.3% which was faster than in any previous comparable period but this was largely the result of faster growth of inputs, both capital and labour. Adjusting for this, total factor productivity grew at 0.9%, exactly the same as for the period 1856 - 1899 but much faster than 1900 - 13 when it was close to zero (Mathews 1964 p.81). Comparison with other economies shows that total output per man-hour grew faster in the UK than the average of O.E.C.D. countries which it had failed to do before 1913 (Aldcroft, 1967 p 37). Hence both by historical and contemporary comparisons the growth record was good.

This has led to a reinterpretation of the interwar period as one of growth and structural change rather than of waste and decay. This is best illustrated by the immense diversity in the experience of different industries which is concealed by the aggregates. Table 4.1 gives indices of industrial production for broad sectors for certain years. The contrasts stand out clearly with the traditional staple sectors failing to show significant increases over 1913. The poor performance of this group would become clearer if coal, cotton, and ship building were separated out

individually.[1]

Table 4.1

Indices of Industrial Production 1913 = 100

	1924	1929	1932	1938
Total Industrial Production	108.4	125.5	111.9	158.7
Mining and Quarrying	94.0	93.1	75.7	85.2
Chemicals and Allied Industries	110.5	124.1	120.6	155.9
Metal Manufacture	98.4	104.7	75.2	125.0
Engineering and Allied Industries	115.4	141.9	107.4	201.6
Textiles, Leather and Clothing	83.4	84.0	83.9	96.7
Food, Drink and Tobacco	99.7	112.4	110.1	146.2
Other Manufacturing Industries	121.3	152.8	147.4	193.2
Building and Contracting	152.9	217.3	178.8	262.5
Gas, Electricity and Water	139.5	182.8	195.9	301.8

Source Feinstein 1972, Table 51, p.T112. It should be noted that the 1913 figure includes Southern Ireland which is excluded from the later figures.

The causes of the decline in the staple base of the economy are well known and can be treated briefly. It was pointed out in Chapter 2, before the war these industries had depended to a large extent on exports and it was the failure of these traditional exports to recover and expand which was a major cause of their demise.[2]

---

[1] In cotton textiles,for example, production of yarn in 1938 was barely half that in 1912 and of piece goods less than half, while exports had fallen by nearly two thirds and more than three quarters respectively. (Aldcroft, 1970, p. 156). The experience in ship building and coal was similar while woollen and worsted and iron and steel industries fared somewhat better.

[2] Wide ranging general discussions of changes in industrial structure , their causes and effects can be found in Kahn (1946), Pollard (1969), Aldcroft (1970) and Alford (1972).

The lack of expansion of world trade compared with pre-war, the change in the pattern of world demand, the growth of alternative domestic supply in markets cut off by the war, and increased competition in third markets all contributed. Of prime importance however was the decline in competitiveness of british goods which was exacerbated in the 1920s by the eventual restoration of the pound to its prewar parity in 1925. The macroeconomic implications of this are examined in Chapter 5, as are the implications of floating exchange rates from 1931 onwards. These factors contributed to the continuing decline in Britains share of world manufactured exports from 31.8% in 1913 to 21.7% in 1929 and 20.3% in 1937 and in her share of world manufacturing output from 15.8% to 12.1% and 14.7% respectively. (Maizels 1963 Table 8.10 p.220). Using a broad decomposition of exports Maizels found that the regular decline in shares to 1929 owed little to the changed pattern of world trade and was almost entirely due to loss of market share while in the 1930s this was somewhat offset by favourable movements in the composition of trade (1963, Table 8.3, p.200). Accordingly to Feinsteins figures exports of goods and services were only 88% of their 1913 volume in 1929 and 72% in 1937 and their share in national income fell from 26.1% to 22.4% and 16.1% (Feinstein, Table 7, p.T22, Table 19, p.T48).

On the other side of the account are the industries which were growing rapidly: building, public works, vehicles some branches of engineering and chemicals together with a variety of other industries. Again, if industries such as motor vehicles, aircraft, rayon, and electrical engineering are singled out their growth is even more striking.[1] In their interpretation of the inter-war period Aldcroft and Richardson have argued that the emergence of these sectors was important in the overall performance of the economy.

---

[1] In motor manufacturing output grew from 34,000 vehicles in 1913 to 239,000 in 1929 and 508,000 in 1937 (Aldcroft, 1970, p. 182). Similarly for the other industries mentioned, production had only reached negligible values before the war.

Because they were based largely on the home market they could not replace the exports lost by the staple industries and given their relatively small base and their relative capital intensity they could not expand sufficiently to soak up unemployment (Aldcroft, 1966, 1967, Richardson, 1961, 1962 and 1965).[1]

According to Richardson it was the depression in the staples which hastened the resource shift to these new sectors and allowed the economy to shake off its "over commitment" to them. The buoyancy of the new industries served both to mitigate the depression of 1929-32 and fostered the faster growth of the 1930s. This is seen as due to strong backward and forward linkages between them such that they formed a separate development block.

These views have been challenged at a number of different levels. Dowie (1968) highlighted the difficulty in conceptually distinguishing between new and old industries pointing out that with building numbered among the new industries there is a danger of simply identifying new with expanding industries. He computed the index of total factor productivity for the periods 1924 - 29 and 1929 - 37 for broad sectors and each of 17 industries. Productivity growth was not found to be faster in aggregate in the 1930s than in the 1920s nor were new industries always those with the highest productivity growth (1968 pp. 68-70 Table 1, p.74). Whilst it is not denied that in such industries as rayon, rubber and radio scientific advance brought rapid productivity growth, improved organisation increased utilisation and technical progress enhanced the growth of productivity even in contracting industries such as ship building and cotton textiles

Von Tunzelmann examined the input-output table for 1935 and concluded that "the input from new industries into other new industries is less than that from the traditional staples ..., only in chemicals is it above half of

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[1] Much of the material in these articles is also embodied in books by Richardson (1967) and Aldcroft (1970).

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[1] Much of the material in these articles is also embodied in books by Richardson (1967) and Aldcroft (1970).

the latter"(1977, p.4). Using the Leontief inverse he found that restricting the growth of new industries from 1930 to 1935 would have only marginal effects on total output growth. Both he and Buxton found that they were not necessarily more capital intensive and in any case only accounted for about 7% of employment and 3% of the capital stock in 1937 (Buxton 1975 p.218, Von Tunzelmann 1977, p.14). However if one takes share of manufacturing rather than the economy as a whole they formed 19% of employment and 20% of the capital stock.

Though structural change did not emerge abruptly during the interwar period its cumulative effects had important implications for the labour force and employment. One is in the shift to the service sector whose share of total employment rose from 44.3% to 48.5% between 1924 and 1937 while its output share fell from 57.6% to 53.1%. The decline in the share of non-service industries arose almost entirely from the contraction in agriculture and mining while in services the expansion of the distributive trades played an important part (Dowie 1968, p.75). The differences from 1913 are even more marked with the decline of the staples and development of new industries building and services shifting employment growth away from the northern areas and focussing it on the south, particularly the south-east. Among occupational categories, skilled and semi-skilled groups declined relative to both the professional and clerical workers and unskilled workers compared with the positions before the war. Routh has calculated that between 1911 and 1921 changing industrial composition was the dominant factor, in the case of labourers accounting for a more than 40% increase in share. (1980, Table 1.19, p.43). In addition, within the various skill groups the demand for some types of skills expanded rapidly while others contracted and coupled with locational changes this caused a radical restructuring of the composition of employment. The effects on the labour market of these changes are examined in detail in Chapter 7 where structural features of employment and unemployment are examined in detail.

Changing regional and industrial composition has also been regarded as important for the character of cyclical fluctuations during the period. Just as before 1914 exports were an important determinant of variations in economic activity and consequently wider fluctuations are found in these industries. Phelps Brown and Shackle found that in the depression from 1929 employment in export sensitive and producer durable industries fell by a quarter, much more than consumer durables and non durables. But in recovery, it was consumer and producer durables which led while export sensitive employment lagged (1939, p. 124). Similarly Corner's (1956) finding that exports led the downturnis consistent with Beveridge's view that the fluctuation of the 1930's while somewhat more violent was "a lineal descendent of past fluctuations"(1944, p.282). But the recovery was clearly not quite as typical, though investment particularly building had had an important cyclical influence before 1914,its character was different. Richardson (1972) argued that favourable movements in the terms of trade and shifts in income distribution to middle income earners together with falling family size and a taste for new types of goods meant that consumption played an important part in moderating the depression and advancing the recovery.

At a more general level the issue of real and monetary forces in interwar fluctuations has been raised. In tests of "autonomous spending" against money multipliers Barrett and Walters described the interwar period as "strongly Keynesian" (1966, p. 403), but Walters found a much stronger relationship between money and prices than money and economic activity (1969,p. More recently Howson (1975) has argued on general and institutional grounds for the importance of monetary forces and Lothian (1980) has found that changes in the rate of monetary expansion led to changes in the level of nominal income in the two major slumps and recoveries of the period. It seems likely however that monetary changes were at least in part induced by variations in activity. Furthermore there were important policy changes in

the period which had direct consequences both for the level of demand and for monetary growth. Thus in the 1920s initial monetary ease was connected with government deficits and later monetary stringency with the return to the gold standard both of which had a direct impact on the economy as a whole and certain sectors in particular. In the 1930s floating exchange rates combined with a tariff from 1932 influenced both the level and composition of activity. Though cheap money is sometimes accredited with an important role in initiating recovery especially in stimulating private house building, continued expansion in the later 1930s is frequently attributed to the growth of government expenditure for rearmament.

4.2 The Genesis and Impact of Employment Exchanges and Unemployment Insurance

It is impossible to pass on to considering the interwar labour market without reference to the profound changes in social policy which occurred in the years before the war and which were expanded in scope in the following years. From the perspective of the nineteenth century labour market the institution of a national system of labour exchanges and unemployment insurance represents a revolution in the official approach to the problems of unemployment. The system of labour exchanges was passed into law by the Labour Exchanges Act, 1909, introduced by Churchill as President of the Board of Trade. Unemployment insurance followed under the National Insurance Act, 1911, which also provided for a system of health insurance. The promulgation of these measures must be seen in the context of other important reforms introduced by the Liberals in this period.[1] They should be seen as reflecting the widespread concern about unemployment, increasingly the subject of Parliamentary Committees and Royal Commissions and to some extent foreshadowed by the Unemployed Workman Act, 1905.[2]

The establishment of a national network of labour exchanges had been prominently advocated by Beveridge and initially a new department of the Board of Trade was set up with him as Director[3]. This took over some of the exchanges established by local authorities under the Unemployed Workman Act, 1905 and by 1914 there were 409 exchanges and 1067 branch offices

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[1] Other important measures included the Education Acts of 1906 and 1907, the Old Age Pension Act 1908, as well as health insurance introduced at the same time as unemployment insurance and Lloyd George's "Peoples' Budget" of 1909.

[2] It has been prominently argued by Gilbert that, apart from the negative results of the Unemployed Workman Act, past experience played little part in planning the schemes and that, for example, the Report(s) of the Poor Law Commission, 1909, were almost entirely ignored. (1972, p. 242, 259). The measures were largely due to the energy and inventiveness of Churchill, Lloyd George, Beveridge and Llewellyn-Smith. See also Harris (1972,p.362).

[3] The events are described in detail by Harris (1972, pp. 284-6).

covering the whole country.[1] Use of the exchanges was purely voluntary. They received notification of vacancies from employers and except when the employee was involved in a trade dispute, attempted to select the most suitable candidate registered with the exchange, or failing this, to obtain a suitable applicant by advertising the vacancy at neighbouring exchanges or in the National Clearing House Gazette.[2] According to Gilbert "they made a small departure in the direction of true competition, so dear to the hearts of classical economists, in that most imperfectly competitive of all markets, the labour market" (1966, p.264).

They did not however supplant less formal methods of hiring and the "placing index" constructed by the Ministry of Labour indicates that by 1926 only 18% of engagements of insured workers registered at exchanges were made through vacancies filled by the exchanges, reaching 21.3% in 1932 and 28.3% in 1938.[3] A substantial proportion of these, rising to 17.6% in 1929, were filled by applicants from an exchange other than that at which the vacancy was notified. Thus Beveridge argued that the exchanges had played an important role in increasing the geographical mobility though in other respects such as reducing the inefficiencies of casual labour at the docks they had been less successful (1930, pp. 312-323). However this function of the exchanges was largely overshadowed by the requirements of mobilisation and demobilisation for war and more importantly with the administration of the unemployment insurance system.

The introduction of unemployment insurance was a major innovation and

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[1] Most important among the pre-existing exchanges taken over were those of the Central (Unemployed) Body for London (Beveridge, 1930, p. 296).

[2] The development and operation of the labour exchange system up to 1933 is comprehensively described by Chegwidden and Myrddin-Evans (1934).

[3] The placing index is derived as the ratio of vacancies filled by the exchanges to the number of hires, represented by the number of withdrawals of employment books from the exchanges in a given period. There is little information on this ratio for the 1920s and the figures quoted are from Chegwidden and Myrddin-Evans (1934, p. 176) and Beveridge (1944, p. 80).

was virtually without precedent anywhere in the world.[1] Initially contributions were set at 2½d per week each for employers and employed workers and $1\frac{2}{3}$d from central government and benefits at 7s. a week for 15 weeks in any year. These rates were set on the basis of calculations which would have ensured a surplus for the fund in all but abnormally depressed years.[2] It was originally introduced for a small group of trades - building, construction of works, shipbuilding, mechanical engineering, iron founding, construction of vehicles and sawmilling, when carried on in connection with another insured trade - covering about $2\frac{1}{4}$ million workers in all. These were trades which were thought to be most readily insurable in that they were not based on casual labour and suffered regular cyclical unemployment which was not met by short time working.[3] It is no accident that these were among the trades which were heavily unionised in which unions had established the most comprehensive schemes of out of work benefit, and in which most was known about the pattern of unemployment. Neither is it surprising that unions felt that the system could undermine their strength if it supplanted some of their functions. As a consequence unions were invited to take a part in administering the scheme and provided with financial incentives to provide benefits in addition to those offered by the state (Gilbert, 1966, p.279-80).

The system was extended in 1916 and again in 1920 to include all occupations except those which were thought to be uninsurable or in which the

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[1] The only known precedent for a compulsory scheme was one which operated briefly (and disastrously) in the Swiss Canton of St. Gall, 1894-6, but in some of its aspects it followed the so called "Ghent system" which was more popular.

[2] Harris (1972), p. 312; Gilbert (1966), p. 282.

[3] The considerations determining the scheme are best summarised in extracts of an address given by Llewellyn-Smith in 1910 quoted by Beveridge (1930, p. 265-6).

risk of unemployment was low[1] and, by 1922, it included an estimated 58% of the occupied population. In 1919 and 1920 the insurance system was overshadowed by the out of work donation scheme instituted to avoid the economic and political disruption which might have followed demobilisation. As Beveridge commented "From the donation scheme dates the term 'dole' indiscriminately applied later to insurance benefit also: from it dates the concept of largesse in which all were entitled to share". (1930, p.274). Owing to the rise in the price level which had doubled over the 1913 level by 1920 standard benefit rates were raised to 11s. in 1919 15s. in 1920 and 20s. in 1921 being lowered slightly thereafter but continuing at more than double the pre war rates.

In a recent controversial paper Benjamin and Kochin have argued that "unemployment benefits were on a more generous scale relative to wages than ever before or since". According to their index "By 1931 weekly benefits exceeded 50% of average weekly wages" and "by 1938 covered workers were indefinitely eligable to receive benefits equal to nearly 60% of average weekly wages". (1979, p.446). From this and other evidence including econometric equations they concluded that much of the abnormally high level of interwar unemployment could be accounted for by the effects of benefits operating in a way similar to that analysed in Chapter 3 with reference to union benefit provisions. The econometric arguments are taken up in Ch. 5 but preliminary to that it is necessary to examine the question of how generous the system really was.

As their index of the providence of the system Benjamin and Kochin used the benefit rate which would have been applied to a successful male claimant with a wife and two children as dependents. This is given as

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[1] Besides all those earning over £250 a year, the main occupational groups omitted from the scheme were agriculture, forestry, horticulture, private domestic service, military service, teachers, police, railways and those employed in certain other public utilities, nurses and established civil servants. Agriculture was brought in in 1936 and domestic service in 1938 and a special scheme set up for banking and insurance.

Table 4.1

Weekly Rates of Benefit for Various Groups 1920-38

Year	(1) Benefit Rate for Adult Male with Wife and two children (shillings)	(2) Benefit Rate for Adult Male (shillings)	(3) Benefit rate for Adult Male with Wife (shillings)	(4) Weighted Index of Benefit Rates (shillings)	(5) Average Benefit Payment per Unemployed Worker (shillings)
1920	11.3	11.7	11.7	11.44	
1921	16.83	16.7	17.5	16.34	7.13
1922	22.00	15.0	20.0	17.48	12.81
1923	22.00	15.0	20.0	17.48	12.37
1924	23.67	16.1	21.1	18.86	11.86
1925	27.00	18.0	23.0	21.17	13.23
1926	27.00	18.0	23.0	21.17	11.49
1927	27.00	18.0	23.0	21.17	9.77
1928	27.67	17.3	23.7	21.08	10.98
1929	28.00	17.0	23.0	20.96	14.39
1930	29.50	17.0	25.6	21.89	8.93
1931	29.54	16.6	25.3	21.60	13.12
1932	27.25	15.3	23.3	20.01	15.08
1933	27.25	15.3	23.3	20.01	15.67
1934	28.60	16.1	24.6	21.04	15.71
1935	30.30	17.0	26.0	22.28	16.32
1936	32.00	17.0	26.0	22.90	18.72
1937	32.00	17.0	26.0	22.90	18.89
1938	32.75	17.0	26.2	23.00	15.68

Sources: Columns (1), (2) and (3) are full rates of benefits for adult males with dependents as specified. These were calculated from the table of rates given by Burns (1941), Appendix VI, Table IX, p. 368 and, where changes in rates took place during the year, the appropriate average of rates was taken. Col. (4) was obtained first taking an average of unemployment shares by age and sex for 1925 and 1935. The dependents' allowances were calculated by using the 1% sample of claimants taken by the Ministry of Labour in April 1927. Of males over 17 years, 39% had no dependents and the total dependency ratio was 1.56 :1 , for females over 17, 90% had no dependents and the dependency ratio was 0.15 : 1. Applying these proportions to the unemployment weights, gives an overall dependency ratio of 1.27 : 1 and, under the assumption that for males, the first dependent would be an adult and the rest would be children, about 38% of them would have been adults. The resulting weights for different rates of benefit were as follows:

(see page 4.13a)

Table 4.1 continued

Sources (cont.)

Men	21 years and over	0.75
Men	18 - 20 years	0.05
Boys	16 - 17 years	0.02
Women	21 years and over	0.15
Women	18 - 20 years	0.02
Girls	16 - 17 years	0.01
Adult dependents		0.49
Child dependents		0.78

The final series in Column (5) is calculated from total expenditure on benefit of the insurance and supplementary national systems given by Burns (1941), Appendix IV, Table VII, P. 361 divided through by total number of insured unemployed. The expenditure figures are for financial years and hence do not exactly match the unemployment figures which are for calendar years especially 1921-26 when the financial year ran from July.

column (1) in Table 4.1 where, for comparison, four other indices of benefit rates are given. The index used by Benjamin and Kochin rises from just over eleven shillings in 1920 to a peak of 29.5 shillings in 1930-31 and, after a slight fall, to nearly 33 shillings in 1938. By contrast the index for an adult male alone rises much less sharply and was higher in the years 1925-1927 than at any other time. The absolute difference between these two rates gets progressively larger over the period illustrating that the sole cause of the rise in the benefit rate from the mid 1920s is the increases in dependents allowances. If child allowances are eliminated, this still remains broadly true as can be seen from column (3). Dependent benefits were introduced in November 1921 and they account for the sharp rise of Benjamin and Kochin's index from 1920 to 1922 and from 1929 to 1930, both times at which unemployment rose sharply. On the other hand, partly because of the expansion of dependents' allowances, these were times during which the rates for individuals fell and, hence, quite a different impression may be gained from different indices. Moreover married men with one adult and two child dependents were in a minority both on the unemployment register and among the labour force as a whole and, in this sense, the index does not represent a typical group.

In order to provide a more representative measure, a weighted index of benefit rates was computed, taking the average of family types as reflected in the sex and age composition of claimants on the register and the average dependency ratios for each of these groups obtained from a sample survey of the family composition of claimants. This series is given as column (4). Because dependents' allowances still take a considerable weight in the index, its profile is not unlike that of column (1) even though it contains rates for women and juveniles which

are omitted in column (1). However, including these rates makes a considerable difference to the overall level of the index and the divergences become greater in the 1930s and, by 1936-7, the rate is only about 80% of that in column (1). It is also useful to measure actual benefits paid per unemployed worker, given as column (5). The year to year variations in this series are misleading, given that total expenditure is measured for the financial year and average unemployment for the calendar year but the overall average levels are approximately correct. These are less than half the levels of column (1) in the 1920s and little more than half in the 1930s. The difference between this and column (3) is due to a proportion of the unemployed not receiving benefit while serving days waiting or because they were ineligible, their claims had been disqualified or they were being paid benefits at below the standard rate.

To compute the benefit to wage ratio one needs the appropriate wage rate. If one were concerned only with the ratio for adult men with three dependents, then the ratio given by Benjamin and Kochin is an overestimate because the wage series used is a weighted index of rates of earnings across all those in employment, including women and juveniles. A survey taken by the Ministry of Labour in 1935 (near the peak of the benefit to wage ratio) yielded average weekly earnings of 48s. 11d but, for men aged 21 and over, into which category those receiving benefits at rates given in column (1) must have fallen, the average was 64s. 6d; more than 30% higher[1]. On this reckoning

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[1] The findings of the survey were reported in the Ministry of Labour Gazette, July 1937, p. 257. Even though the sample covered 5.5 million workers, about 40% of the insured population, the weights may not be representative of the whole. An alternative estimate of the average obtained by applying the approximate aggregate employment weights for different groups by age and sex, gave an average of 47s. raising the differential of adult male average to 37%

the benefit to wage ratio would have been 0.43 in 1936 compared with Benjamin and Kochin's 0.57[1]. For the unemployed as a whole, however, it is more appropriate to take the weighted index of benefit rates relative to average earnings which gives a peak ratio of 0.41 in 1936. Taking average benefits paid out in column (5) would further reduce the ratio to about a third.

These measures are very similar to those calculated by Metcalf, Nickell and Floros (1982) who found that inter war benefit to wage ratios were not substantially more generous on average than those for the postwar years[2]. Extending this comparison to the pre 1914 period indicates a lower ratio for the insurance system. More pertinently among trade unions the ratio would have been lower. The modal benefit rate in 1908 was about 10s., the rate paid by the A.S.E. and weekly wages for workers in engineering and boilermaking were, according to the 1906 wage census, 32s. 5d., giving a benefit to wage ratio of about 0.3[3].

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[1] The figure would be slightly lower if the 2% increase in average wages between 1935 and 1936 were taken into account.

[2] Metcalf, Nickell and Floros computed a weighted index of benefit rates based on the composition of the unemployed and in addition, an index of benefits paid per unemployed worker. Their measures yield benefit to wage ratios in 1936 of 0.45 and 0.37 respectively (1980, Table 1, pp. 6-7). In their reply to the criticisms of Metcalf, Floros and Nickell, Benjamin and Kochin (1982, p. 425) argued that applying the average wage for manual males in 1935 (quoted above), they underestimated the benefit to wage ratio. Benjamin and Kochin are wrong in arguing that the series they use is appropriate for adult male manual workers for the reasons stated above. They are also mistaken in thinking that the Chapman and Knight series which they use applies only to insured workers.

[3] The data given by the Board of Trade indicates that of approximately 1.5 million workers entitled to receive benefits, over 900,000 were eligible to receive more than 9s per week, of which 600,000 were entitled to between 9s. 3d and 10s. A summary of the 1906 wage census is given in Mitchell and Deane (1962, Table 36). Benjamin and Kochin (1982, p. 424) using other sources, also arrived at an average benefit to wage ratio of 0.3 for prewar trade unions.

It should be clear from the foregoing that Benjamin and Kochin have grossly overestimated the generosity of benefits offered by the insurance system between the wars. Average rates divided by wages were roughly equal to those in the immediate postwar years but substantially higher than those before 1914.

Rates of unemployment benefit alone are an inadequate indicator of the "stance" of the insurance system which also depends on the qualifications for the receipt of benefit and the rigour with which they were applied. In 1920, 20 contributions were required in the previous year before benefits could be claimed and benefits could then be received for up to 15 weeks but with mass unemployment emerging simultaneously with the extension of the system, these conditions were widely waived[1]. These waivers which imposed large deficits on the insurance fund were gradually developed into supplementary systems which, from 1930, were separated from the accounts of the fund and financed directly by the treasury[2]. From 1934 to 1938, approximately equal amounts were spent annually by the insurance and supplementary systems in spite of the fact that these benefits were means tested and increasingly stringent

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[1] These conditions were changed from time to time in the ensuing period. For a full account of the changes to 1931, see Burns (1941, p. 47). Burns argued that both the increase in benefit rates and the liberalisation of qualifying conditions were due to fears of the distress which might otherwise have been caused by mass unemployment, "Hence it is not surprising that the relaxations of the insurance rules were accompanied by increases in benefits" (1941, p. 45). Deacon (1976, p.18, 1977, p.11-13) has argued that this was engendered more by fears of public disorder, leading to possible revolution, rather than out of concern for the unemployed.

[2] These supplementary arrangements went by a variety of different names: from March 1921, "Uncovenanted Benefits" from August 1924, "Extended Benefits", from April 1928, "Transitional Benefits", from November 1931, "Transitional Payments" and finally from January 1935, "Unemployment Assistance". This eventually took over the functions of the Poor Law which was to provide a safety net against poverty rather than insurance against unemployment.

conditions applied after 1931[1].

Among the other conditions applied which could disqualify an individual from benefit were that he had left his employment voluntarily or had been dismissed for misconduct, absenteeism or lateness but not for incompetence or unsuitability for the work. Similarly he would be disqualified if directly involved in a trade dispute but not if his unemployment was the secondary effect of a dispute[2]. The condition causing the most difficulty was that the applicant for either the insurance or supplementary scheme was "genuinely seeking work but unable to find suitable employment".

Insurance claims were adjudicated in the first instance by Insurance Officers with referral to a local committee and, ultimately on appeal to an "Umpire" with full judicial status. The onus of proof of "genuinely seeking work" was on the applicant but, with so few vacancies and so many unemployed, this was almost impossible to determine[3].

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[1] In her detailed study of the operation of these systems, Burns found that, in the 1920s, "Insurance Benefits were ... paid ultimately almost indefinitely at uniform rates, regardless of length of unemployment. They were thus too high for the short term unemployed and too low for the long period unemployed" (1941, p. 98) and, from 1931 to 1935, although the full rate was only awarded to about 30% of applicants for Transitional Payments, "there is evidence that in a great many cases, transitional payments were made to families who could not be held to be in need when the resources of the family were taken into account." (1941, p. 140-1).

[2] These conditions are described in detail by Hill and Lubin (1934, pp. 149-153).

[3] One important aspect of this which is relevant to the discussion in the following chapter is that, in the presence of mass involuntary unemployment, it is impossible to distinguish those who are voluntarily unemployed.

The difficulty is reflected in the Umpire's decision of 1926 that "the most important fact to be ascertained is the state of the applicant's mind" (quoted in Burns, 1941, p. 93). The clause was abolished in 1930 leading to a sharp increase in claims by married women and seasonal and temporary workers with the result that, in 1931, the Anomalies Act introduced measures to remove such claims. The proportion of claims disallowed, which had averaged about 15% in the 1920s, fell sharply in 1930 and jumped sharply in 1931 as a consequence.

Most studies have concluded that at the various levels, the officials combined discretion with an intimate knowledge of personal and local circumstances to prevent malingering on the dole and this was the conclusion reached by the Blanesburgh Committee of 1930. Deacon has pointed out that the rules were applied with increasing stringency in the 1920s to compensate for the liberality of the rules themselves (1976, p.41). Insurance benefits were available as of right and benefits from supplementary systems came to be viewed in the same light as not bringing the stigma and odium attendant on the Poor Law. According to one informed contemporary, it was not so much the generosity of the scales that was at fault as the wide opening of the door to claimants who had no moral title to any such payment at all (Davison, 1938, p. 9).

At the other end of the spectrum, there were a large number of workers who were normally in employment but who frequently claimed benefit for short periods of unemployment or temporary layoffs. Once an initial waiting period of a week had been served, any three days in six working days could be counted as continuous unemployment and, provided they occurred within six weeks, such three day periods could

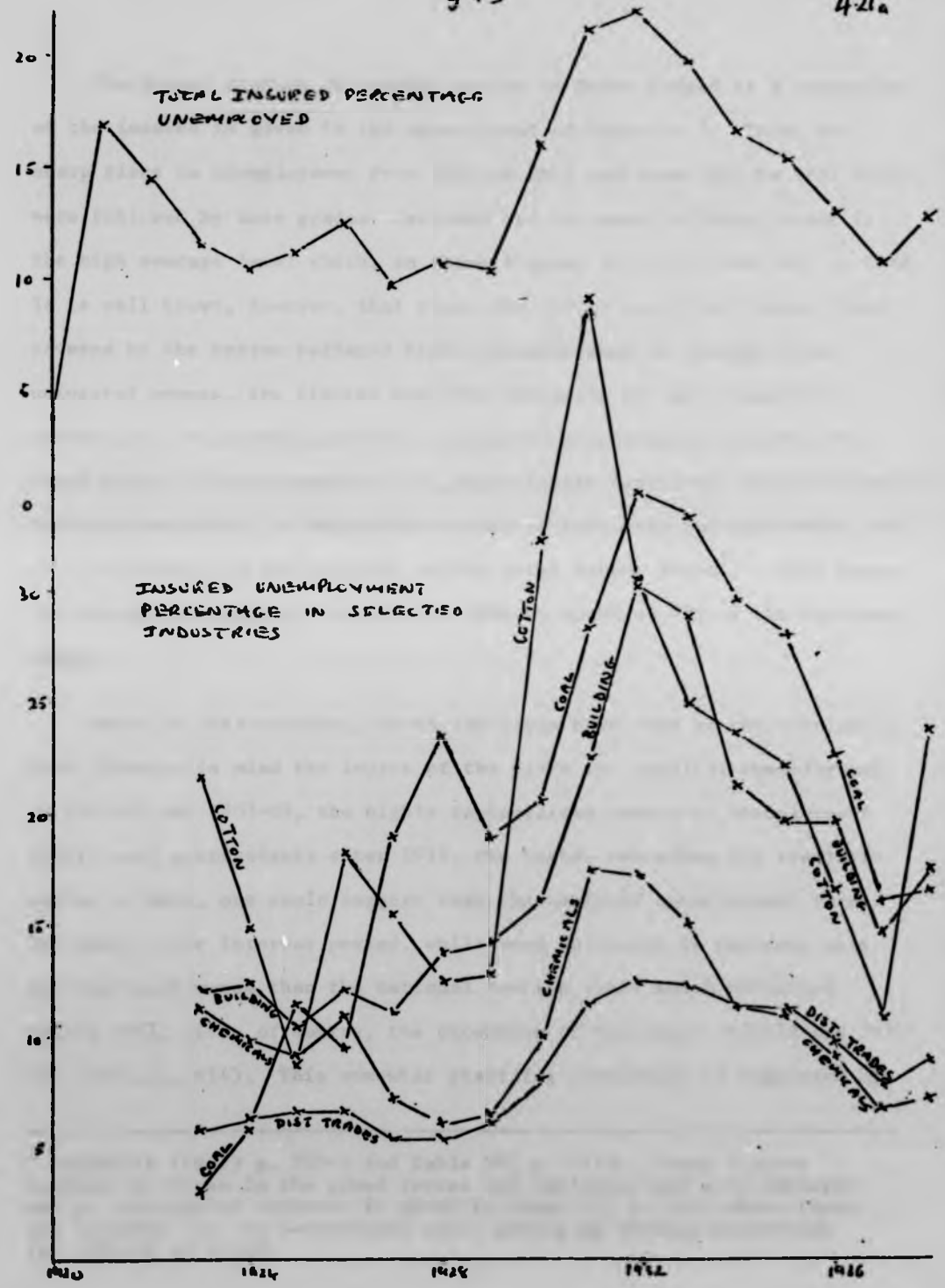
also be linked up. This gave rise to the so-called OXO system in which workers could potentially alternate short periods of employment and unemployment so as to maintain continuous eligibility for benefit. Benjamin and Kochin (1979a, p. 447) emphasised this aspect of the system as unusually generous though it has also been carried over to the postwar period (Metcalf et al. 1982, p. 394).

4.3 The Dimensions of Unemployment

One important effect of the combined operation of labour exchanges and the insurance system is that the information available on labour market aggregates is of a completely different order and quality from that available before the war. This however creates its own problems since, in some respects, it makes comparisons between the pre-war and inter-war labour markets more difficult. This difficulty is further exacerbated if, as has been argued, the very existence of these institutions changed the structure of incentives and the organisation of the labour market.

The Ministry of Labour gave two definitions of unemployment, "Books Lodged" and "Live Register". The former included all those insured workers with claims to benefit or applications for work by insured non claimants plus the "Two Months File". This was the total of those whose insurance books remained at the exchange (and who had not, therefore, taken insured employment) but had ceased to register in the last two months. The alternative definition of the Live Register, which is not normally used for statistical purposes, excludes the two months' file but includes workers outside the insurance scheme registered at the exchanges. In numerical terms the two definitions do not differ by much and the extent of under or over counting implied by these definitions has been widely discussed. Given that the denominator used to obtain the percentage unemployed is the insured population as measured on the mid year exchange of insurance books, it appears that there may be a small upward bias though it is unlikely that this would affect the percentages much.

Fig 4-3


TOTAL INSURED PERCENTAGE UNEMPLOYED
INSURED UNEMPLOYMENT PERCENTAGE IN SELECTED INDUSTRIES
COTTON
COAL
BUILDING
CHEMICALS
DIST. TRADES
20
15
10
5
0
30
25
20
15
10
5
1920
1924
1928
1932
1936

The annual average of monthly totals of Books Lodged as a percentage of the insured is given in the upper panel of Figure 4.3. There are sharp rises in unemployment from 1920 to 1921 and from 1929 to 1932 which were followed by more gradual declines but the most striking aspect is the high average level which, on these figures is 14.1% from 1921 to 1938. It is well known, however, that since the 60% or so of the labour force covered by the system suffered higher unemployment on average than uninsured groups, the figures are over estimates of the economy wide percentage. Feinstein provided an adjusted percentage by raising the total number of unemployed by the proportionate deficiency in 1931 obtained by comparison with the population census of that year and expressing this as a percentage of the estimate of the total labour force[1]. This lowers the average percentage from 1921 to 1938 to 10.8% or 77% of the insurance figure.

Based on this revision, Booth and Glynn have come to the conclusion that "Bearing in mind the impact of the peaks in cyclical unemployment in 1921-22 and 1931-33, the highly regionalised nature of unemployment before and, particularly after 1914, the better recording and regularisation of work, one could suggest that the national unemployment rates for most of the interwar period, while very different in pattern, were not very much worse than the national average rates which prevailed before 1914, with, of course, the exception of the years 1921-22 and 1931-33" (1975, p. 614). This somewhat startling conclusion is supported by

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[1] Feinstein (1972) p. 220-1 and Table 58, p. T128. These figures exclude all those in the armed forces and employers and self employed and an alternative estimate is given in Table 57, p. T126 where these are included (in the denominator only) giving an average percentage for 1921-38 of 10.0%.

the argument that Feinstein's percentages are on average too high because the year used to extrapolate from was extraordinarily depressed giving rise to a smaller than usual differential between insured and uninsured groups (1975, p. 613-4). Though they offer no evidence that this was the case, it is likely to have had some effect since the ratio of unemployment rates between industries with low and those with high unemployment appears to increase as the general unemployment rises but the precise significance of this is not known[1].

However, there are also biases operating in the other direction. For instance, as they pointed out (1975, p. 613) there was a significant under recording of the "temporarily stopped" amongst the uninsured. In addition, the census which took place in April 1931 fell between two important insurance acts already mentioned, the abolition of the "genuinely seek work" clause in 1930 and the Anomalies Act of October 1931. On most estimates, this abnormally raised the insurance figures by about one percentage point which would make them higher relative to uninsured unemployment in 1931 and hence biases Feinstein's figure downwards especially in the 1920s[2]. Even if further adjustments

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[1] The evidence presented in Chapter 7, Appendix 7A1, gives strong support to the view that high unemployment industries were more cyclically elastic.

[2] The effects of "administrative charges" were estimated by the Ministry of Labour mainly from the examination of the Two Months File which contained the insurance books of all those who had ceased to register as unemployed but had not found insured employment up to two months after registration had lapsed. These estimates were published from time to time in the Gazette and, although it was stressed that these estimates could not be reliably added up over time, this approach has, at least by implication, been taken in a number of statistical enquiries; see, for instance, W.Eady in evidence to the Royal Commission on Unemployment Insurance (1931) Minutes of Evidence, p. 121, Galenson and Zellner (1957), pp. 575-8 and, most recently, Garside (1980) pp. 49-53. The Ministry estimated that, in the short term, the effects of the measures introduced in 1931 was to reduce the register by 157,000, the vast majority of whom would have been women, this number representing 4.5% of insured females in July 1931 or about one percentage point of total unemployment on a similar reckoning.

could be made to the figures, it seems unlikely that the overall picture would be changed very much and it is likely that, on any adjustments, the general percentage of unemployment would come out at between 20% and 25% lower than that indicated on the insurance figures[1].

The question raised by Booth and Glynn however, involves the comparison of interwar with prewar averages. The problems in interpreting the prewar Trade Union percentages have been discussed at some length in Chapter 2 and, if the average percentage of 4.5 for 1881 to 1914 is compared with the insurance figure, it is nearly 10 percentage points lower. Yet where the two series overlap, they are quite close as was previously noted. For the peace time years 1921-26, the insurance figures give an average of 12.8%, compared with the Trade Union average of 12.0% and when the Trade Union figures are reweighted to accord with the insurance data for the years 1912 to 1922, they are also very close[2]. Thus it might be argued that, if the insurance figures are to be revised downwards by 20% or more, the same should be done with the Trade Union figures. It is interesting to note that Booth and Glynn quote with approval Beveridge's suggestion that, when various differences in the basis of comparison are taken into account, the average percentage before the war would fall between five and seven percent. They fail to recognise that Beveridge was attempting to compare the Trade Union figures with the insurance percentage and not with some alternative lower estimate. His reservation about the Trade Union figures has already been noted but,

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[1] This appears to be the range favoured by Booth and Glynn though Glynn and Oxborrow (1976, p. 148) also quote Clark's estimate of the true percentage of unemployed in 1931 which, at 73% of the insurance figure, is even lower than Feinstein's.

[2] See Chapter 2, p. 2.11 - 2.12. This comparison was originally made by Hilton (1923) pp. 182-3 and Appendix 1, pp. 190-1. His figures are reproduced by Feinstein (1972), Table 11.9, p. 225 and Garside (1980, Table 5, p. 22.

despite this, his conclusion was that "unemployment after the first World War was probably nearly two and a half times as severe as before the war but may have been not more than twice, or may have been almost three times as severe"[1].

It seems that however one juggles the figures, one cannot get away from the fact that, on the evidence presently available, the average percentage for interwar unemployment is about 8 or certainly between 6 and 10 percentage points higher than that before the war[2]. According to Booth and Glynn, one should regard the two periods 1921-22 and 1931-33 as exceptional and, by implication not comparable with pre-war. But, excluding these years and taking the average for 1923-30 and 1934-38, gives averages of 12.5% on the insurance figures and 9.6% on Feinstein's estimates which are still more than twice the prewar Trade Union average. In any case it is not clear why the peaks in unemployment should be excluded from the comparison since, as previously noted, fluctuations in unemployment before the war caused the unemployment percentage to vary across a range of about 10 percentage points of unemployment just as in the interwar years.

Of equal importance with the overall level of unemployment is its distinctive structure and distribution. The uneven distribution of unemployment across industries and geographical areas has led many observers to view interwar unemployment as predominantly structural. This issue is dealt with in detail in Chapter 7 with the aid of matrices of data by industry and region which have not been widely used before. It will, therefore,

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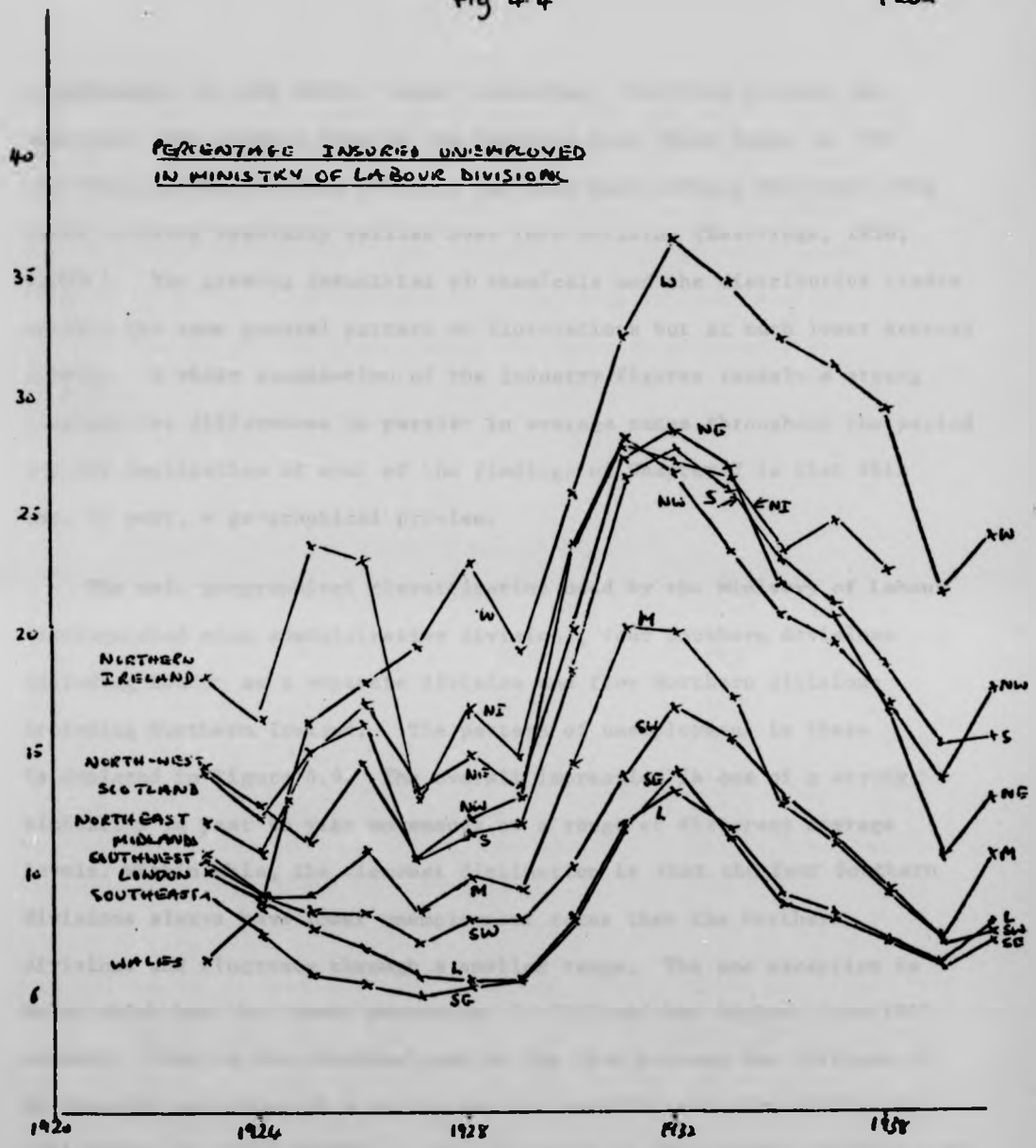
[1] Beveridge (1944, p. 73) Booth and Glynn (1975 p. 613) commented that in suggesting five to seven percent, Beveridge "was probably leaning heavily on the side of caution" though they offer no firm evidence that this was the case.

[2] This, of course, includes the years 1919 and 1920.

suffice here to map out some of the distinctive features in a brief summary.

At the industry level the Ministry of Labour distinguished some 104 sectors for which unemployment percentages were given though the data usually referred to are for a smaller number of major industries. The definition of unemployment by industry is somewhat arbitrary and there appears to have been an awareness of this problem in the Ministry of Labour at quite an early stage (Hilton, 1923, p. 175). The unemployed worker was normally allocated to the industry in which he was last employed unless it was known to have been temporary or short term employment outside his normal industry. At any one time these figures give a wide range of percentages, for instance, in August 1936, they range from 2.9% in tramway and omnibus service to 42.8% in public works contracting. Given that workers would, over time, be redistributed from one industry to another, it is not necessarily the case that industrial unemployment rates mirror variatons in employment. Beveridge was much concerned with this question and the issue is taken up in Chapter 7 but, though trends in unemployment do not appear to reflect trends in employment, variations about the trends are reflected closely. An idea of the diversity of experience among selected leading industries can be gained from the lower panel of Figure 4.3. The low unemployment in coal mining of the early 1920s represents the brief prosperity given to the industry by the French occupation of the Ruhr coal fields but from 1929, the pattern is similar to the aggregate but much higher peaking at over 34%. The ups and downs of the cotton industry crucially dependent on international trade, are reflected in the volatility of the series and the sharp rise from 1929 accurately reflects the international slump and leads the rise in

Fig 4.4


PERCENTAGE INSURED UNEMPLOYED
IN MINISTRY OF LABOUR DIVISIONS
40
35
30
25
20
15
10
5
1920
1924
1928
1932
1938
NORTHERN IRELAND
NORTH-WEST
SCOTLAND
NORTHEAST
MIDLANDS
SOUTHWEST
LONDON
SOUTHEAST
WALES
W
NG
NW
S
NI
M
SW
L
SE

unemployment in home market based industries. Building follows the aggregate very closely despite the building boom which began in 1932 and this, to some extent, reflects the fact that workers displaced from other industry typically spilled over into building (Beveridge, 1936, p.374). The growing industries of chemicals and the distributive trades exhibit the same general pattern of fluctuations but at much lower average levels. A wider examination of the industry figures reveals a strong tendency for differences to persist in average rates throughout the period and the implication of some of the findings of Chapter 7 is that this was, in part, a geographical problem.

The main geographical classification used by the Ministry of Labour distinguished nine administrative divisions, four Southern divisions including London as a separate division and five Northern divisions including Northern Ireland. The pattern of unemployment in these is depicted in Figure 4.4. The overall impression is one of a strong similarity in year to year movements at a range of different average levels. Within this, the clearest distinction is that the four Southern divisions always have lower unemployment rates than the Northern divisions and fluctuate through a smaller range. The one exception is Wales which has the lowest percentage in 1923 and the highest from 1927 onwards. This is the clearest case of the link between the fortunes of an industry and those of a region and the parallel with the profile of coal mining is unmistakeable. Less distinct is the somewhat sharper and earlier rise in unemployment in the North West which is clearly connected with the fortunes of the textile industries.

These figures are all for insured unemployed (Books Lodged) regardless of age and sex. Distinguishing unemployment by sex reveals that the unemployment rate among females was normally between 50% and 60% of the

male unemployment rate. It was pointed out by Beveridge (1936, p. 338) and later by Benjamin and Kochin (1979, pp. 461-4) that the effect of the abolition of the genuinely seeking work clause was to raise female unemployment briefly to over 80% of the male rate[1]. Using industry data Beveridge showed that lower average unemployment among women could be largely, though not totally, explained by lower average unemployment in the industries where the majority of women were employed.

Table 4.2

Relative Rates of Unemployment by Age Group

Age 35-44 = 100

Age	April 1927	February 1931	November 1932	November 1935
16 - 17	33.0	36.7	36.5	33.9
18 - 20	94.1	70.9	74.4	54.0
21 - 24		104.5	107.3	103.8
25 - 34	108.5	97.1	101.8	89.4
35 - 44	100	100	100	100
45 - 54	118.2	115.5	113.2	114.1
55 - 64	150.3	141.3	134.5	154.6

Sources: For 1927, 1931 and 1932, Beveridge (1937) Table XIV, p.14, figures for juveniles (aged 16-17) from 22nd Abstract of Labour Statistics, 1936, pp. 14, 52, 54. For November 1935, Ministry of Labour Gazette, August 1936, p. 278-9.

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[1] This was reversed by the Anomalies Regulations, the effect of which was estimated by the Ministry of Labour by an examination of fluctuations in the Two Months file. As noted above, the abolition of the genuinely seeking work clause is estimated to have increased the register by about 160,000 representing 4.5% of insured females (most, though not all of this change would have been due to females.) It is interesting in this context that a dummy variable entered by Benjamin and Kochin into that equation for female unemployment for the impact of the Anomalies Regulation, gives a coefficient of 4.55 despite the fact that there is no equivalent dummy for the period before the abolition of the "genuinely seek work" clause. Though they construe this as evidence of benefit induced unemployment, it has no bearing on the relationship between rates of benefit and rates of unemployment.

The age distribution is another feature of unemployment. Data obtained from surveys of insured claimants is given in Table 4.2. The most striking feature of the table is the low relative unemployment rates among juveniles, at only a third of that for the age group 35 - 44 and less than a third of the rate for adult males over 21. The age profile of unemployment rates indicates a sharp rise to age 21 - 44 and then a further rise above age 44. Benjamin and Kochin have connected low juvenile unemployment with the low benefit to wage ratio faced by juveniles. Though they argued that "there exist no industries employing an appreciable number of juveniles for which the unemployment rate was as low as the economy wide unemployment rate among juveniles" (1979, p. 457), it seems likely that low industrial unemployment rates would have played some part. Furthermore, the argument misses the point that, for juveniles, employment opportunities were, in large part, specific to the age group rather than the industry[1]. In addition, even though they might have been unemployed, many juveniles would not appear on the register until they had some record of previous employment. It may also be noted that there is some evidence (discussed in Chapter 2, p.2.18) that a rising profile of unemployment by age existed before 1913

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[1] This may be illustrated by Beveridge's comment on the prospects for young workers which is typical of many contemporary observers: "they enter employment, not as learners but as wage earners, doing some work too simple and too light to require the services of grown people ... They leave or are dismissed and their places are taken by a fresh generation from the schools. They find themselves at eighteen or twenty without a trade in their hands, save unskilled labour. They go, therefore ... to overcrowd that already overcrowded market" (1930, p. 125-6) See also Pilgrim Trust (1938) p. 53, Bakke (1933) p. 4-6, Jewkes (1938) pp. 36-40.

when it could not have been the result of the insurance system[1].

A feature of interwar unemployment regarded as most tragic of all and indicative of the labour market conditions faced by the unemployed is the emergence in the 1930s of a "hard core" of long term unemployment. From 1932 onwards the Ministry of Labour gave information on the length of continuous unemployment among applicants to benefit or assistance. This was analysed in detail by Beveridge who provided comparative figures for 1929.

Table 4.3

Proportions of Unemployed Applicants by Duration of Unemployment

Length of Current Spell (months)	September 1929		August 1932		August 1934		August 1936	
	M	F	M	F	M	F	M	F
<3	77.1	84.4	56.3	75.6	54.7	79.1	53.1	74.5
>3, <6	10.7	10.5	11.3	9.3	9.4	8.4	9.2	9.2
>6, <9	4.2	2.3	7.8	4.5	6.4	4.2	6.1	4.7
>9, <12	2.5	1.6	6.8	2.6	5.0	2.1	4.5	2.4
>12	5.5	1.2	17.7	8.0	24.5	6.1	27.0	9.2

Sources: Beveridge, 1944, Table 8, p. 64 and Ministry of Labour Gazette

[1] It might be argued that, since these were applicants for relief, this simply reflected, on a smaller scale, the kind of benefit inducement which Benjamin and Kochin claimed for the interwar years. It appears from the evidence, however, that it was the character of employment opportunities as well as the level of need which determined the age structure of applicants to Distress Committees. In the metropolis there was a wide range of jobs for youths largely involving fetching and carrying, messenger services, barrow boys, etcetera.and this was reflected in the small proportion of juvenile applicants. In the interwar years one industry which employed a large proportion of juveniles, distributive trades, which is noted for its low unemployment, grew from employing a total of 1.18 million workers in 1923 to 1.91 million in 1938.

The proportions in each duration group for 1929 are compared with later dates in Table 4.3. These show a high proportion of short term unemployment of less than three months which declines from 1929 onwards especially among men. A proportion of these would have suffered repeated spells interspersed with short periods of unemployment or non-registration and so the proportions do not reflect the distribution of unemployment among individuals. In the long term unemployed group with durations of at least a year, and especially among men, there is a sharp rise from about one in twenty of applicants in 1929 to more than one in four in 1936. In terms of absolute numbers long term unemployment was, in 1936, six and a half times that in 1929. Among women the percentage is considerably lower but there is an even greater proportionate rise.

Beveridge showed that this was intimately connected with the regional, industrial and personal characteristics of the unemployed. Across the Ministry of Labour divisions the proportion of long term unemployment rose with the unemployment rate so that in 1936, it was only 8% of total in London but 38% in Wales. Similarly with age; while long term unemployment accounted for 4.2% of the insured in the age group 35 to 44, it rose to 10.5% of the age group 60 - 64 in 1936. (1937, Table XII, p. 8-9, Table XIV, p. 14). This was reflected in the proportion of claims admitted to benefit which was higher for women than men despite a higher rate of disallowance among women. As Beveridge pointed out, after 1934 the contribution requirement was not very stringent, ten contributions would qualify an applicant for 26 weeks of benefit in the next insurance year. Yet in 1936, only 45% of applicants qualified for benefit while 38% received means tested unemployment insurance. It is difficult to reconcile this with the hypothesis that among the significant group of those who were unemployed for more than six months, there was much voluntary benefit induced unemployment.

Though, as reflected in the share of claimants receiving benefit, the proportions of unemployment for more than six months generally varied with the unemployment percentages by industry, there were important exceptions principally in the textile industries where high unemployment was combined with a high proportion on benefit. This reflects the practice in these industries observed before the war, of meeting a large part of unemployment by short time working, i.e. of less than a full week. As previously noted, the "OXO" system allowed individual days of unemployment to be linked together for the purpose of claiming. Similarly, even though days waiting may have to be served, it appears that a significant proportion of the unemployed were temporarily laid off.by their employer with a definite promise of return to work. From 1926 the Ministry of Labour classified these separately as "Temporarily Stopped". This group averaged 19.2% of the unemployed between 1928 and 1938 and, if unemployment among casual workers, also separately classified, is added in, the total rises to nearly a quarter. This share declines with the rise in long term unemployment in the 1930s, suggesting that it formed an important part of unemployment for three months or less. Whether this group can be connected with benefit inducement is the subject of empirical enquiry in Chapter 6 but it is worth emphasising at this stage that, as was pointed out in Chapter 2, short time working had been a characteristic of the policy of firms in several industries and, hence, there is no prima facie case for suggesting that this was simply a product of the benefit system.

4.4 Trades Unionism, Industrial Disputes and Collective Bargaining

Changes in the institutional structure of the labour market between the prewar and interwar periods were both rapid and profound. While employment exchanges and unemployment insurance provided a new framework and a new relationship between the worker and the state in employment matters, organisation among both workers and employers and the structure of collective bargaining also underwent a change. But here also, though the immediate effects of the war and its aftermath were important, it acted largely to extend or accelerate developments which could already be discerned before 1914.

War brought the need for total mobilisation and reorganisation of the labour force, it required not only the replacement of workers who enlisted in the armed forces but the rapid expansion of industries producing or providing inputs for munitions as well as the substitution for goods previously imported. From 1915 it was recognised that this could not be achieved without the cooperation of organised labour. Trade unionist labour M.P.s were brought into the government, trade union leaders took part in the management of strategic industries as members of various control boards, and on a wide range of committees concerned with the domestic organisation of war trades unions were represented. In strategic industries, branch officials by allocating exemption cards, effectively operated the conscription scheme on behalf of the government.

In exchange for the promise that prewar practices and conditions would be restored after the war, unions relinquished many of the rights and working agreements for which they had fought and achieved in earlier decades. Among skilled trades in strategic industries, agreements on 'dilution' brought unskilled or semiskilled workers in to replace or

augment the depleted ranks of skilled workers. Restrictions were placed on labour mobility and strikes declared illegal but, despite this, strike activity did not disappear. Imposition of these conditions from above led to a number of unofficial disputes, notably in South Wales and on the Clyde. From this there emerged an unofficial shop stewards' movement which was contained during the war and rapidly disappeared in the ensuing slump[1].

In 1913, total union membership reached 4.14 million, some 23% of the labour force, rising to a peak of 8.35 million, almost 48% of the labour force in 1920. Though membership doubled in these years, it had doubled between 1905 and 1913 and, hence, the war can be seen as continuing the pre-existing trend. As in previous spurts of growth, all of this increase was not held and, by 1922, membership had slumped to 5.6 million and continued to erode, reaching a low point of 4.4 million in 1935 when it was close to the level of twenty years earlier[2]. In this respect, the effects of war appear to have caused a transient extension of an existing trend but the aggregates mask developments in labour organisation which were more significant than the mere numbers would suggest.

In view of the abrogation of trade union liberties, the disruption of the labour market and the removal of many unionists into military

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[1] This movement has been discussed at length by Hinton (1973) who analyses the links between the ideas of syndicalism and industrial unionism and the movement and, in turn, its relationship with the embryonic communist party. The movement failed to flourish and ultimately collapsed due largely to the conflict of goals faced by skilled workers. (See also Lovell, 1977, pp. 52-3).

[2] These figures are taken from Bain and Elshiekh (1976, Appendix E. p. 134.)

service, the wartime and immediate postwar growth of unionism is surprising. But it has been argued that one of the important effects of war was to give a new legitimacy to trades unionism which brought them recognition, both from the government and employers as the representatives not only of specific groups of labour but of the working class as a whole. The Webbs saw this clearly as early as 1920 when they observed "We may, in fact, not unfairly say that Trade Unionism has, in 1920, won its recognition by Parliament and the Government by law and custom, as a separate element in the community, entitled to a distinct recognition as part of the social machinery of the State, its members being thus allowed to give ... not only their votes as citizens but also their concurrence as an order or estate" (1920, p. 635).

Though growth took place in the traditional fields of unionism, it provided an ever stronger stimulus to newly organised groups. Major growth areas were among what the Webbs called the "black coated proletariat", in shops, offices and warehouses and especially among women. As in previous phases of growth, there was rapid growth among the unskilled and labouring groups. The government played a key role in these areas either through legislative change affecting particular industries or directly as employers which led to unions in local and national government service and the Post Office being recognised. But even in these areas unionism had begun before the war and the new status and recognition also affected groups such as miners and railwayment whose industries were directly controlled during the war[1].

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[1] Thus, for example, the National Amalgamated Union of Shop Assistants, Warehousement and Clerks was started in 1891, the Railway Clerks Association in 1897 and the National Union of Teachers in 1890. The public service unions were de facto recognised in 1906 but it was not until after the war that full bargaining rights were accorded to miners and railwaymen.

Leaving aside the boom in growth centred on the war, if the postwar distribution of membership is compared with that around the turn of the century, the changes are marked. In the traditional areas of unionism, mining, engineering, cotton and building, membership increased by 129% between 1897 and 1924 whereas in transport, public and private service and among general labourers, the growth was over 400% in each case. Thus the percentage of total membership in the traditional group fell from 56.8% to 40.8% (Tarling and Wilkinson, 1982, p. 10). As was noted earlier, the nineteenth century staple industries came under extreme pressure between the wars and the recovery of the 1930s was at least, to some extent, based on new industries producing for the domestic market away from the geographical centres of unionism. Yet from 1933, membership underwent rapid growth rising to 6.3 million in 1939. Again it was led by groups outside those which had dominated unionism in the nineteenth century.

Though Bain and Elshiekh found no structural breaks in the equation for membership growth over the whole period 1893 - 1970, the fit for the years before 1913 is not particularly good and one might suggest that there were differences after 1913[1]. From 1913 the pattern of union growth follows the pattern of boom and slump very closely, suggesting a strong link between unionism, wage and price change and unemployment. There appears to be close relationship for the interwar period between changes in union density and in wage rates

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[1] Tests for structural breaks were conducted, breaking at 1922 and 1932. In either case the sharp boom and slump of 1918 - 22 is included in the first period which it appears to dominate (Bain and Elshiekh, p. 79 and Figure 2.2, p. 82).

which holds fairly consistently at the industry level and hence it appears not to be confined to the newer and growing sectors (Burkitt, 1974, Bain and Elshiekh, 1982).

Labour unrest characterises the whole period from 1910 to 1930. The period 1910-13 saw a number of large scale strikes such as those by the miners, cotton operatives and railwaymen which virtually brought whole industries to a standstill and those in the four years following the war, while more intense, followed the same pattern (Cronin, 1979, p. 52). In 1910-14 an annual average of 16.1 million working days were lost, falling to 4.2 million in 1915-18 and rising again to 35.6 million from 1919 to 1923. In this period, the pattern of labour unrest follows the pattern of union growth quite closely and econometric evidence points to an explanation in terms of sharply rising prices and increasing union membership (Cronin, 1979, p. 133).

Of particular significance is the largest strike of all, the General Strike of 1926 which does not seem to fit into this pattern particularly well. Though it is often seen as a total defeat for organised labour, this is largely the view from the top where the General Council of the TUC capitulated after nine days, deserting the miners to fight on until November, 1926 facing ultimate defeat and returning to work on the employers' terms after staying out for six months. First to be called out were workers in transport, printing, building, iron and steel, heavy chemicals and power. Though the strike never became truly general, in the sense of a total withdrawal of labour, there was almost total solidarity in the industries called out. Though defeat and recrimination were to follow, the general strike reflected the ability of organised

labour to stop the whole economy if need be. (Pelling, 1976, pp. 174-78).

The general strike has been seen as bringing to an end the period of militancy and marking a change in attitudes towards a more conciliatory approach which lasted through the 1930s into the 1950s[1]. The annual average of days lost averaged 28 million for 1919-26 but fell sharply to 3.3 million for 1927 - 1939. However, Clegg has argued that this did not open a new era in industrial relations - the fall in days lost was due to the decline in the number of major national disputes which marked the disappearance of the main causes of these disputes. These were rapid changes in prices to 1923 and then pressure on the staple export industries occasioned by the loss of export markets and the return to the gold standard. This is illustrated by the fact that national disputes in the cotton industry continued after 1926 until Britain left the gold standard (Clegg, 1954, pp. 3-7). Thus most of the industrial unrest from 1910 onwards concerned pay settlements as the central issue. In later work, Clegg explained some of the important features in the development of collective bargaining which had appeared since the early years of the century. "Before the war ... it was difficult to discern a definite trend towards industry wide pay settlement. The war made the difference. The cost of living rose rapidly throughout so that wages had to be adjusted upwards repeatedly. In these circumstances the settlement of rates of pay separately town by town and district by district became cumbersome and dilatory. At the same time the extension

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[1] This new approach is often seen as being reflected in the Mond - Turner talks of 1928-9. Though these were abortive, they are more appropriately viewed as reflecting adherence to the principles of "Whitleyism" which also characterised the National Industrial Conference of 1919 (Clay, 1929 , p. 154-8, Clegg, 1954, pp. 17-21, Bain, 1964, p. 143).

of state control throughout the munitions industries and into coal, transport and elsewhere meant that the government had assumed final financial responsibility for much of the economy and had, in the last resort, to take decisions about increases in pay. Consequently, in many instances, the unions were able to bypass local groups of employers with their separate attitudes and interests and take their case to a government department capable of reaching a decision for the whole industry" (1976, p. 203).[1]

In this, as in other aspects, government intervention appears as the key factor fostering the changes which occurred. During the war industry wide settlements, first in railways, coal and engineering, then spreading out to other industries, were made under the auspices of the Committee on Production which acted as the ultimate arbitrator. But even before the war, the beginnings of such developments can be found. The Conciliation Act of 1896 and the Trade Boards Act of 1909, which provided a means for fixing industry wide minimum wages in unorganised industries can be seen as approval and direct encouragement of centralised collective bargaining (Flanders, 1963, p. 272). The importance of the war, however, is reflected in the recommendations of the Whitley Committee which was set up in 1916 to examine the future conduct of industrial

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[1] It is interesting to note that in his survey of developments in collective bargaining, Rowe argued that national bargaining over wages and the standardisation of wages and conditions was, by 1913, virtually inevitable. "The war, in fact, warped the normal evolutionary process to a surprisingly small extent: what it did do, was to quicken it." (1928, p. 144). However, Rowe's analysis was restricted to five industries in which collective bargaining was most fully developed before the war to the exclusion of a wider consideration of industry as a whole.

relations. This gave positive encouragement to the industry wide organisation of both employers and workers. Where the industry was already well organised, it recommended the setting up of Joint Industrial Councils which would act as the focus of collective bargaining over wages and a wide range of other issues affecting the industry and, where it was not so organised, new Trade Boards were to be set up.

In the event, by 1921, 73 Whitley Councils had been set up and, although many disappeared in the ensuing slump, there were still 46 in 1926 in addition to 30 Trade Boards. Flanders has argued that the extent to which collective bargaining arrangements set up during the war and immediately after endured, was related directly to whether the industry was sheltered or exposed to foreign competition (1963, p. 278-9). But this is only part of the explanation; where Whitley Councils and Trade Boards were maintained was in industries which had no collective bargaining arrangements of any significance before the war and hence could not easily revert to the pre-existing arrangements (Clay, 1929, p.160-1). The significance of this is that though the Whitley Councils and Trade Boards covered only 4 -5 million workers, they ensured that practically the whole field of wage employment was covered by some provision for organised collective bargaining. In most cases, these continued to operate industry wide systems of pay regulation which resulted in a substantial standardisation of pay within industries (Clegg, 1976, p. 205, Clay, 1929, p. 176-7). In some industries, such as railways and building, there was almost total standardisation of rates whilst in mining, there was (against the will of the miners) a reversion to district bargaining and engineering stood between these two extremes with a national standard but district variations.

The developments outlined were also important in determining the criteria for pay settlements. As previously noted, the nineteenth

century practice was to consider wages in the context of "the state of the trade" or "what the industry could afford" which, in many cases, meant using the criterion of selling prices. But, by the turn of the century, there was increasing dissatisfaction with this, particularly since movements of the terms of trade were not favourable to increasing the real purchasing power of workers. The South Wales miners repudiated their sliding scale in 1902 and in 1912 the mining unions mounted a claim for a minimum wage which indirectly resulted in the strike of 1912 involving a million workers (Webbs, 1920, p. 513-516). During the war the overall determination of wage increases was based on the rise in the cost of living index which was constructed by the Ministry of Labour. Even after the war, when prices had fallen sharply, the Ministry's index number was still widely taken as the point of reference for comparison with 1913 (Clay, 1929, p. 85). As a basis for wage settlements, the cost of living index was retained in such industries as railways and in all spheres of direct government employment and in other industries where the wartime structure of collective bargaining was maintained. That such arrangements were not continued in mining is indicative of the conditions which led to the general strike though, by contrast, the iron and steel industry remained on a selling price sliding scale which had worked successfully before the war.

By the end of the 1920s, there was a wide spread feeling, at least among academic observers, that institutional change had altered the balance of forces operating in the labour market such that adjustment of wage rates to secure a low overall level and relatively even distribution of unemployment had become increasingly difficult to achieve. This consensus indicated that unemployment insurance had strengthened the hands of trade unionists in wage bargaining and Joint Industrial Councils

and Trade Boards ensured their policies would be imposed on unionists and non unionists alike (Pigou, 1927, Clay, 1928, Rowe 1928, Ch. 5) Writing in 1947, Pigou summed it up thus: "Every improvement in the rate of benefit paid to unemployed persons, and every increase in the length of the period over which the benefit is paid under a national system of social security, lessens the extent to which the fear of consequential unemployment deters trade unions from exerting pressure for higher and higher wages. Under the comparability criteria used by Trade Boards in badly organised industries, this pressure operated "at least as strongly" as under collective bargaining (1947, p. 27).

These views have since been echoed by historians viewing this from a wider perspective. "Britain seemed to be in the middle of the theoretical gold standard adjustment process, stuck there with unemployment having no marked tendency to depress wages and prices. Union wage scales, unemployment insurance and unemployment relief tended to hold wages up. Recurrent labour disputes including a general strike and a lengthy coal strike in 1926 dramatized how hard it was to reduce costs and prices" (Yeager, 1966, p. 278; see also Garraty, 1978, p. 192-3). With these observations in the background, we now turn to examining the pattern of unemployment and wage rates in more detail.

4.5 Wages, Prices and Living Standards Between the Wars

The course of wage rates and prices is of considerable interest and is shown for the period from 1913 to 1938 in Figure 4.5. The data are from Feinstein (1972) who gives an implicit GDP deflator and reports the retail price or cost of living index of the Ministry of Labour. The wage index is for average weekly earnings which reflects variations in hours worked and payment by results and the changing composition of the labour force. From 1920 to 1938 it is Chapman's series which is essentially a weighted index of wage rates[1].

The graph exhibits three important characteristics. First, compared with wage and price fluctuations between 1913 and 1923, the rest of the period was one of stability. The wage index does not reflect the ups and downs of economic activity as that for the prewar period. Secondly, there is a strong similarity in the movement of all three indices from 1913 onwards but especially from 1923[2]. Thirdly, from the war onwards, real wages, whether measured relative to the GDP deflator or the cost of living index, were higher and rose consistently above the level of 1913.

The Ministry's cost of living index is rather crude and the basket of commodities somewhat unrepresentative of the typical workman's budget but, though it fluctuates more than alternative indices during

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[1] See the lengthy discussion in Chapman (1953). Virtually the only industry in which variations in hours have much effect on the series is coal mining.

[2] The dip in the wage in 1926, not reflected in the price indices, is undoubtedly due to the effect of the general strike, particularly on wages in mining.

Fig 4.5

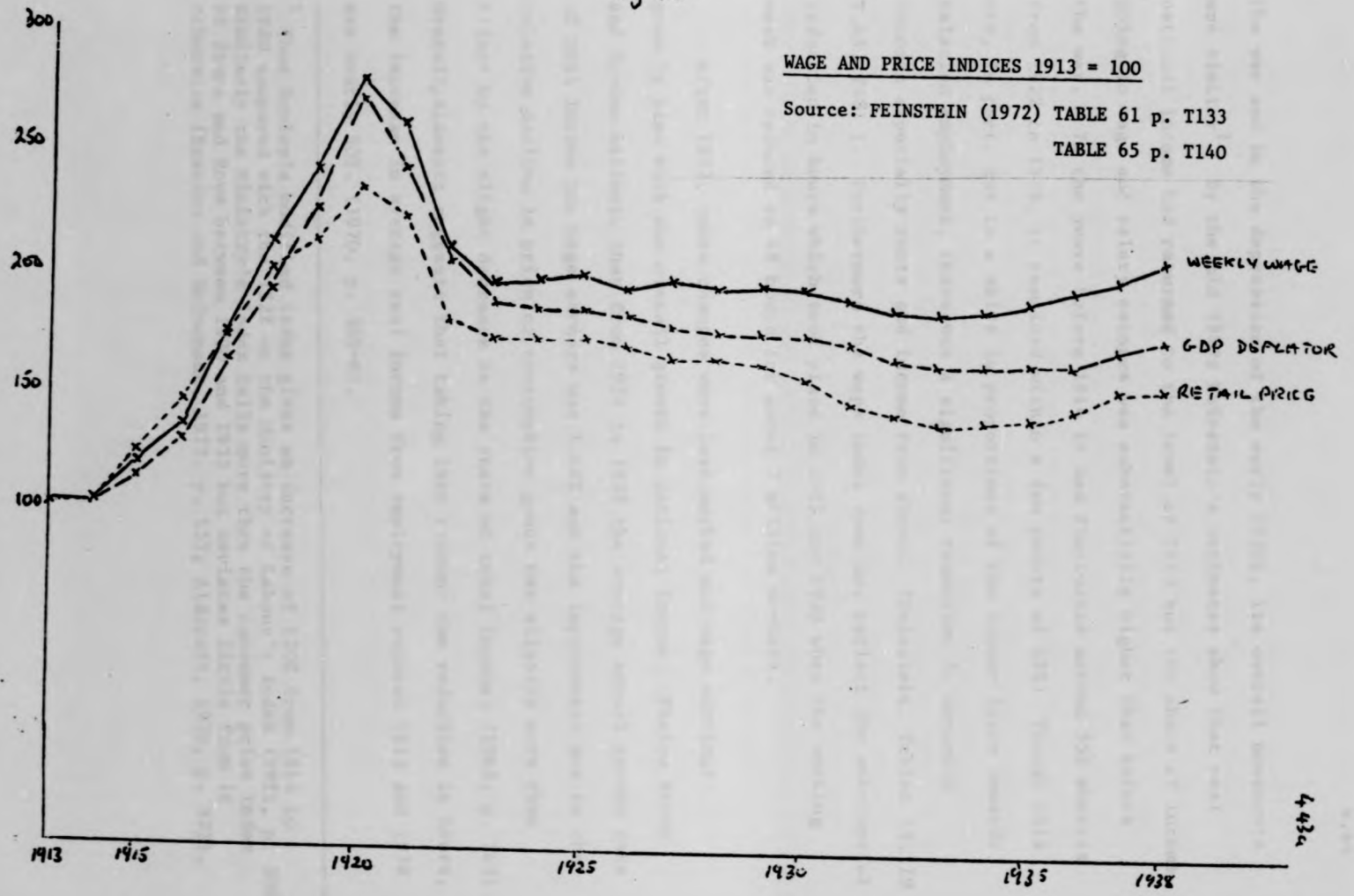
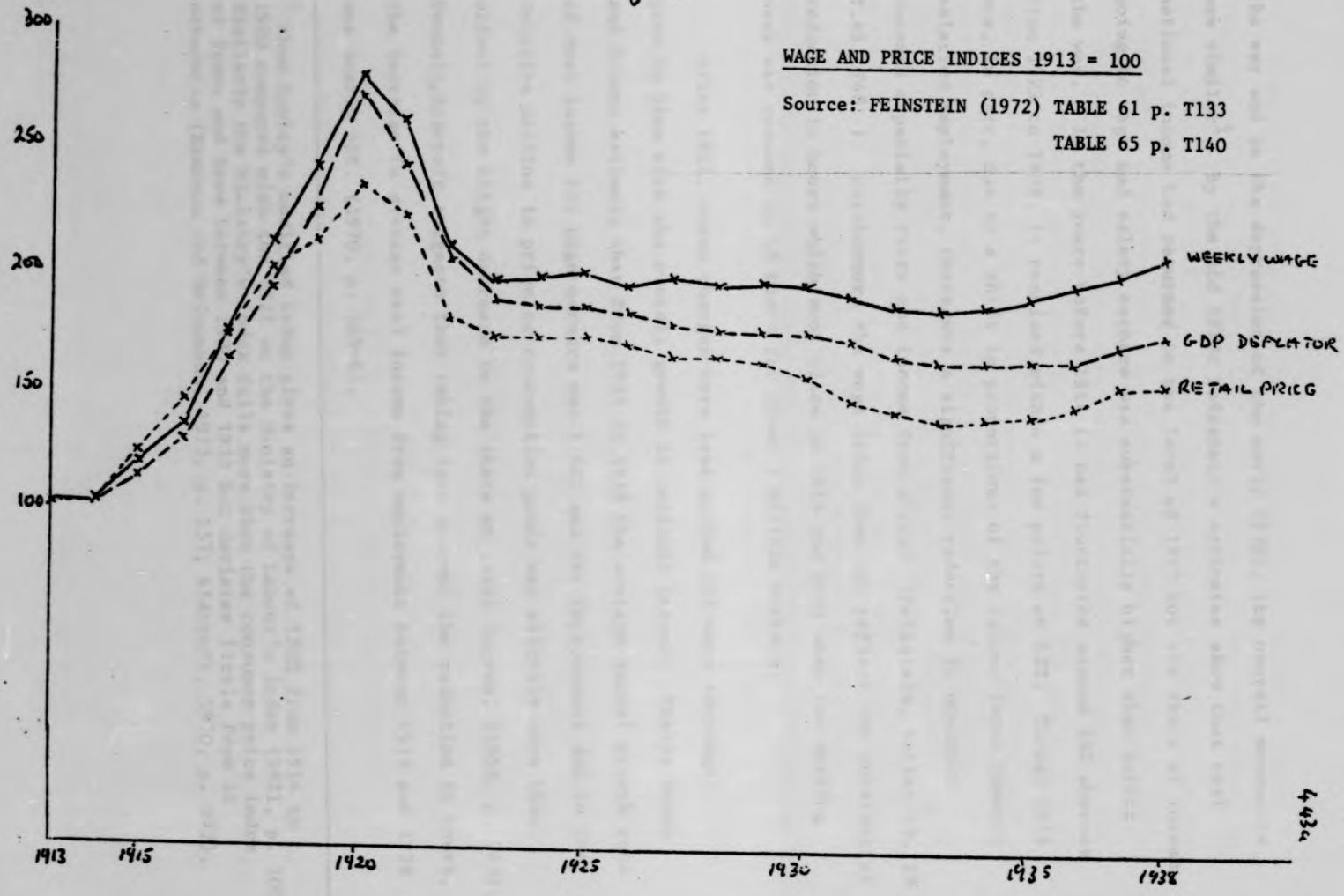

WAGE AND PRICE INDICES 1913 = 100
Source: FEINSTEIN (1972) TABLE 61 p. T133
TABLE 65 p. T140
300
250
200
150
100
1913
1915
1920
1925
1930
1935
1938
WEEKLY WAGE
GDP DEFLATOR
RETAIL PRICE

Fig 4.5


WAGE AND PRICE INDICES 1913 = 100
Source: FEINSTEIN (1972) TABLE 61 p. T133
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300
250
200
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1913
1915
1920
1925
1930
1935
1938
WEEKLY WAGE
GDP DEFLATOR
RETAIL PRICE

the war and in the depression of the early 1930s, its overall movements are similar[1]. By the mid 1920s Feinstein's estimates show that real national income had returned to the level of 1913 but the share of income going to wage and salary earners was substantially higher than before the war. In the years before 1914 it had fluctuated around 55% whereas from 1922 to 1938, it remained within a few points of 62%. Though this was, in part, due to a shift in proportions of the labour force towards salaried employment, there was a significant reduction in unearned incomes especially rents and income from abroad (Feinstein, Tables 18, 19 T.45, T48). Furthermore the wage index does not reflect the substantial reduction in hours which took place in 1919 and 1920 when the working week was reduced to 48 hours for about 7 million workers.

After 1922, these changes were less marked and wage earnings grew in line with the overall growth in national income. Phelps Brown and Browne estimate that from 1924 to 1938 the average annual growth rate of real income for wage earners was 1.68% and the improvement due to the relative decline in price of consumption goods was slightly more than offset by the slight decrease in the share of total income. (1968, p. 263). Overall, Aldcroft suggests that taking into account the reduction in hours, the increase in average real income from employment between 1913 and 1938 was nearly 50%. (1970, p. 365-6).

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[1] Thus Bowley's modified index gives an increase of 120% from 1914 to 1920 compared with the 152% on the Ministry of Labour's index (1921, p. 106). Similarly the Ministry's index falls more than the consumer price index of Stone and Rowe between 1930 and 1933 but deviates little from it otherwise (Branson and Heinemann, 1973, p. 157; Aldcroft, 1970, p. 373).

Empirical investigations of wage change for the interwar years have generally come up with rather poor results. As has been noted, in his original paper, Phillips did not estimate the wage equation for any period after 1913 but simply superimposed the curve estimated for 1861 to 1913 on observations for later periods. The years 1921 to 1922 are clear outliers which were attributed to rapidly changing prices but, for the rest of the period, Phillips concluded that "[t]he actual results obtained given the levels of unemployment which were held, could have been predicted fairly accurately from a study of the prewar data, if anyone had felt inclined to carry out the necessary analysis" (1958, p. 295). In his subsequent paper, Lipsey estimated the relationship for 1923-39 and 1948-57 as one period and found that the curve had pivoted upwards at high levels of unemployment so that there was no intercept. The dominant variable explaining wage change was now not unemployment but price change which entered with a coefficient of 0.7. Further, the characteristic anticlockwise loops changed direction in the 1920s and Lipsey explained this by the changed cyclical pattern of unemployment for which he offered no evidence (1960, p. 27). Nevertheless, Lipsey broadly supported the observation that the relation had not shifted much .

Efforts to include variables representing the dispersion of unemployment percentages in submarkets in the Phillips curve have met with only modest success. Terms for the variance of unemployment across Ministry of Labour divisions were included for 1925 to 1938 by Archibald Kemmis and Perkins (1974) and Thomas and Stoney (1972). In neither case

were these variables individually significant[1]. In so far as they attempt to test Lipsey's aggregation hypothesis, this might have been expected[2] However, Thomas and Stoney also postulated a "wage transfer mechanism" Wage change is a function of unemployment and price change in a "leading" region and wage change in this region enters as an additional variable into the Phillips curves of other "following" regions. This was tested for 1925-38 by including an additional term in the difference between the unemployment percentage in the South East and the aggregate. With this representing the leading sector effect both unemployment terms were individually significant (1972, p. 229).

However, it has been pointed out that the significant feature in the process of wage determination in the interwar years was the shift to industry wide bargaining. Thus the relative wage levels to be taken into account in bargaining would seem to be between industries rather than regions. But it is possible, on the other hand, that, within each industry the wage was set by reference to its most prosperous section and low unemployment region reflects this in aggregate. No attempt has been made to test for wage leadership at the industry level and, in any case, it would be difficult to identify the leading industry and there is no reason to suppose it would not change from one year to the next.

The only other successful model was that estimated by Hines (1964) in which wage change was related to the level of and changes in union density. This relationship, particularly with changes in density, appeared to be

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[1] This was also tested and rejected by Smythe (1979, p. 230-232).

[2] This is because on Lipsey's own analysis, Phillips curves in individual markets were linear at high levels of unemployment so that, to the extent that individual markets were on the linear segment of the curve, dispersion would not displace the aggregate relation upwards.

particularly strong for the interwar period and using lags on the variables, Hines tested the direction of causality, concluding that it was unionism which led to wage change and not the reverse[1]. Nevertheless. as has been noted, several studies have proceeded on the assumption that trade unionism is the dependent variable and wage change among the independent variables. Hines' findings for these years have come in for heavy criticism but whatever its interpretation, the wage change-density change relation appears to be fairly robust (Purdy and Zis, 1972 Dogas and Hines, 1974). This has also received fairly strong support at the industry level (Burkitt, 1974). There is no indication from the results that the effect was confined to, or stronger in, specific industrial groups such as sheltered industries or those in which collective bargaining was newly established.

That there was substantial change in the structure of wage rates both within the interwar period and especially between interwar and prewar, is confirmed in a recent study by Norris (1979). Using data from wage surveys conducted by the Board of Trade and Ministry of Labour, rank correlation coefficients were calculated for average weekly earnings in 29 industries across different periods. This revealed only a weak correlation between the wage structure in 1906 and interwar years, especially 1931, when the correlation coefficient was insignificant. Surprisingly, the correlation of 1906 with 1938 was stronger than with

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[1] This result is somewhat weakened by the fact that according to Hines' hypothesis, union density is only a proxy variable representing union "militancy". Thus, finding that density changes systematically precede wage change, does not necessarily support the view that the latter was caused by union militancy.

any other interwar year and, hence, changes in the wage structure up to 1931 appear to have been partly reversed in the 1930s. (1979, p. 371). Industries with average weekly earnings in 1924 below the 1906 level were largely export industries and those which had expanded disproportionately during or immediately after the war. With 1913 = 100, the index of engineering wages was 103.1, cotton 97.5 and shipbuilding 77.7 compared with the unweighted average of 122.5. By 1938 these were 143.3, 91.7 and 101.1 compared with the average of 138.2 (1979 , p. 372).

Using the same basic material, Routh calculated averages of wages across different skill groups and Table 4.4 reports some of his findings. It will be seen that, among aggregates of skill groups, there was not much change in differentials between 1924 and 1935 and the major changes occur between 1906 and 1924. Among these the most decisive changes were

Table 4.4

Relative Annual Earnings for Different Skill Groups

	1906		1924		1935	
	£	index	£	index	£	index
Foremen	113	100	268	238	273	242
Forewomen	57	100	154	270	156	274
Skilled Men	97	100	182	188	197	203
Skilled Women	39	100	85	218	84	215
Semi-skilled Men	63	100	126	200	134	212
Semi-skilled Women	46	100	98	212	100	216
Unskilled Men	60	100	134	223	136	227
Unskilled Women	26	100	73	280	73	280

Source: Routh (1980), Chapter 2. Various Tables

relative improvement at each end of the skill distribution; among supervisory workers and the unskilled and across skilled groups, among women relative to men. For the most part, these changes took place during the war years up to 1920 and the improvement for unskilled workers and especially women can be ascribed in part to the operation of the Trade Boards. Insofar as some groups of workers were on piece rates or some form of payment by results, the decline in activity would have reduced their average hourly earnings more than the index of rates would indicate and these were almost exclusively in the industrial sector[1].

Other changes in the wage structure compared with before the war are more difficult to establish with much certainty, due largely to lack of information from the earlier period and changes in the structure of employment. Routh found that, in aggregate, the female/male wage proportion increased less than might have been expected from the figures in Table 4.4. Using current weights, it was 53% in 1913-14, 57% in 1922-24 and 56% in 1935-36 (1980, p. 123). Differentials by age also remained large. In the Ministry of Labour survey for 1935, referred to above, the average wage in industry for boys and youths under 21 was 36% of the adult male wage and, for girls under 18, it was only half the adult female wage. From various industries covered in the 1906 wage census, it appears that proportion for boys and youths is about the same at 30-40% and for girls somewhat higher at 50-60%. Across geographical regions, there is little information for aggregates but for some industries, such as building, there is a marked leveling of rates across major towns. For fitters and turners in engineering, the trend is less clear especially given the regional standardisation in hours. Similarly, among compositors, the range of regional variation appears to have contracted only slightly.

[1] There appears to be little information on what this proportion was during the interwar period but it was later estimated to have been 29% of men and 48% of women in manufacturing in 1938. (Crossley, 1966, p. 167).

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(Department of Employment, 1968, Tables 1-4, pp. 28-35).

Added to these tendencies towards greater equality were the effects of taxes and benefits, particularly for sickness, unemployment and old age which reduced the gap between wage earners and those without wages or other income to support them. With the tax exemption level at £160, national insurance contributions and indirect taxes, the working class contributed a considerable amount to the benefits they received. But the tax system in aggregate was more progressive than before the war. An estimate for 1937-8 indicates that the net effect was to raise working class incomes by 8-14%, reducing those of the upper and middle classes by 10-18%[1].

It might be anticipated that with the rise in real income, redistribution and the ext ension of social services, poverty on the scale revealed by the prewar studies of Booth and Rowntree would have been largely eliminated. In 1936 Rowntree conducted a further survey of York which covered the entire working class population[2]. As in his earlier survey, the "human needs" standard was set by a basic nutritional criterion though this was higher than that adopted in 1899. It was found that 31.1% of those in working class families were living below this minimum, some 17.8% of York's population. Using the same poverty line as 1899, however, only 6.8% fell into the category of primary poverty as compared with 15.5% in the earlier survey. The causes of poverty were also altered somewhat, the share due to the death or illness

[1] These results were obtained for different sets of assumptions by Barna and are quoted in Aldcroft (1970, p. 372). Other studies referred to were less detailed than Barna's and indicated smaller redistributory effects.

[2] As Glynn and Oxborrow (1976, p. 33) point out, the definition of working class is somewhat arbitrary and excludes 35% of the population, some of whom would, in most definitions, be working class and a proportion of whom may well have experienced poverty.

of the chief wage earner was more than counterbalanced by the share due to old age[1]. The proportion in primary poverty due to low wages had fallen from more than a half to less than ten percent and that due to large family size by two thirds but, most significant, was the increase in the share of poverty due to unemployment. Despite the fact that all the families in this group were receiving unemployment benefit or assistance, it accounted for 44.5% of primary poverty compared with 2.3% in 1899 (1941, p. 110).

Under the new standard, unemployment and low wages accounted for 28.6% and 32.8% respectively of those below the minimum but the most severe poverty was felt among the old and unemployed and in the poorest group, more than half of total income was made up of state benefits[2]. (1941, pp. 36, 39). Thus these benefits were not large enough to protect recipients from severe poverty and Rowntree estimated that 76% of unemployed persons were living below the minimum. His model family of a man, a dependent wife and three children was rather atypical of the population at large but, with full benefit, it would have received 69% of the minimum, with a miner's wage 84% and with the average wage 112%. (Glynn and Oxborrow, 1976, p. 39). But while large families may not have escaped poverty even with the chief wage earner employed, smaller families

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[1] As Rowntree pointed out the increased share of poverty attributed to old age is due, not only to the growth in numbers over 65 but also to the fact that with state pensions, many of them were now able to live independently, albeit in poverty.

[2] In Rowntree's group A, living at a level 10s or more below the minimum, nearly half of all poverty was accounted for by unemployment. In the whole group below the minimum, state benefits made up 80% of income where the chief wage earner was unemployed and 66% where he was too old to work (pp. 41-43).

would be in poverty on benefits but might be considerably above the standard with the chief wage earner employed[1].

Given its industrial composition, based on railways and chocolate and confectionary making, York was not amongst the areas worst hit by unemployment. A wide range of surveys of other industrial towns conducted at different times, however, broadly confirmed the findings in York. Using a similar minimum standard, 10% of the working class population of Bristol were found to be below the minimum and a lower standard yielded roughly the same proportion for London. These standards were, of course, potential, not actual, since "inefficient" spending could push families with sufficient income below the minimum consumption standard. In a controversial study, Boyd-Orr showed that if actual expenditure was measured, then as much as half the population were undernourished in some respect[2].

Despite these depressing findings, it is clear that had they faced the same conditions before the war in the absence of social services , their plight would have been very much worse. Moreover, with smaller average family size and an increasing share of the working population

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[1] In York the average family size was 3.37 persons. Rowntree's minimum was defined exclusive of rent which would normally have amounted to anything between 5s and 10s per week. Minimum needs, exclusive of rent and unemployment benefit for different family types where the chief wage earner was unemployed, were as follows in 1936:

	Minimum	Benefit
Man (alone)	22s.9d	17s
Woman alone	17s.6d	15s
Man and Woman	27s.8d	26s
Man, Woman and one child	35s.0d	29s
Man, Woman and two children	38s.8d	32s
Man, Woman and three children	40s.5d	35s

Sources: Rowntree (1941), p. 30, Burns (1940), Table 81, p. 368.

[2] The results of many of these studies and their implications are widely discussed in a number of secondary sources, see, for instance, Mowat (1955) Ch. 9, Aldcroft (1970), Ch. 10, Branson and Heinemann (1973), Ch. 14, Glynn and Oxborrow (1976), pp. 33-45.

moving into higher paid and salaried occupations, a large proportion had considerably higher standards than before the war. From a sample of working class budgets in 1937-8, some 40.1 % of expenditure went on food compared with 61.1% for a similar survey in 1904 and that remaining for other items after food, rent, heating and clothing, exceeded 25%.

Thus, for many families, not only were living standards well above subsistence but there was an increasing margin for the purchase of luxuries, durables and better quality goods. This is reflected in the growing output of motor vehicles and domestic appliances which became widely diffused in the 1930s, in the growth of small savings in banks and National Savings deposits and, above all, in the boom in home ownership and private housebuilding in the early 1930s. In these respects, the improvement in standards was similar in nature, though not in extent, to the 1920s in the United States which have been labelled the "New Era". The irony of interwar Britain is that this took place side by side with the persistence of mass unemployment and the continuance of grinding poverty for a significant proportion of the population.

CHAPTER 5

UNEMPLOYMENT, UNEMPLOYMENT BENEFITS AND THE MACROECONOMICS OF THE INTERWAR LABOUR MARKET

5.1 The Debate over the Role of Unemployment Benefits

In view of the high levels of unemployment which prevailed throughout the period, it is widely held that there must have been a serious failure in economic policy. In the economic historiography of the period, the blame is often laid firmly at the feet of government policy in failing to adopt a more aggressive exchange rate policy in the 1920's or failing to expand aggregate demand in the 1930's. Thus it is the failure to depart from tradition and to adopt a more directly interventionist policy which is frequently criticised. More controversial is the recent argument of Benjamin and Kochin (1979) in which a large part of unemployment is attributed to the policy of providing unemployment benefits at such high levels and making them so widely available. In this view, it is not more policy activism which is called for but less and the government is seen as directly responsible for inducing unemployment. The argument about the possible impact of alternative reflationary policies is taken up later in the chapter but first, we re-examine the benefits hypothesis in detail.

In the previous chapter a number of points were made which, though they do not test the benefits hypothesis directly, tend to cast doubt on its plausibility. It is worth briefly bringing them together. It is clear that, when appropriately measured, unemployment benefits were not nearly as high relative to wages as claimed by Benjamin and Kochin. The majority of those subsisting on benefits or assistance lived at a level of poverty with insufficient income to ensure adequate nutrition for the maintenance of physical efficiency. Whether one looks across

age groups or sexes, regions or industries or across time, there is a general tendency for long term unemployment to rise more than proportionately with increases in unemployment rates. Given the desolate plight of the long term unemployed, it is difficult to interpret this as reflecting the voluntary choice of individuals for long term leisure as against available opportunities for employment.

Enough has been said about the structure of demand in the interwar period to indicate that, to a considerable extent, it explains differences in the unemployment experience of particular industries and regions - an issue examined in detail in Chapter 7. As far as the distribution by age and sex is concerned, structural change may also have been responsible though it also seems likely that differences in sex and age specific unemployment rates existed before the introduction of a national insurance scheme. The evidence indicates that structural change only affected the structure of wage rates partially and, in some cases, perversely. Age differentials hardly changed at all and skill differentials narrowed but industrial differentials were somewhat more flexible. Though Benjamin and Kochin suggested that regional wage differentials might be connected with unemployment through lower wage rates and, hence, higher benefit to wage ratios in high unemployment regions, the evidence of regional wage data does not indicate substantial variation (Benjamin and Kochin, 1979a, p. 473; Metcalf, Nickell and Floros, 1980, p. 29).

Collins correlated average wages by industry with average industry unemployment rates and, though the correlation was negative, it was not significant (1982, Table I, p. 374).

In the light of these findings, the cross section evidence adduced does not seem to support the case put forward by Benjamin and Kochin but the main weight of their argument rests on the estimated coefficients of a single equation time series model. This took the following form:

$$U = a_o + a_1 B/W + a_2(\ln Q - \ln Q^*) \qquad (5.1)$$

where U is the percentage of the insured population unemployed, B/W is the benefit to wage ratio, Q a measure of output and Q* its exponential trend over the sample period (1920 - 1938). All the coefficients were significant at conventional levels and the point estimate for a_1 was 18.3. They assumed that at a B/W ratio of 0.27 or less (that existing immediately before the war) there would be no benefit induced unemployment. Taking this zero-effect level together with some other assumptions to be discussed later, they used the coefficients to calculate the counter-factual level of unemployment which would have existed in each interwar year had there been no benefit induced unemployment. They summarised the results of this exercise as follows: "We estimate that the insurance system raised the unemployment rate by five to eight percentage points on average and that, in the absence of the system, unemployment would have been at normal levels throughout much of the period" (1979, p. 441).

This striking conclusion provoked a number of critical studies, some of which have recently appeared, together with a rejoinder by Benjamin and Kochin. These have emphasised some of the points raised earlier but, in large part, have concentrated on attempting to undermine the results of Benjamin and Kochin's econometric model in order to overturn their conclusion. One step has been to use alternative measures of the benefit to wage ratio (Metcalf, Nickell and Floros, 1980, Tables 6 - 9, pp. 22-25). However, when Benjamin and Kochin used my weighted index of benefit rates using interwar weights or that calculated by Metcalf et al. with 1972 weights in their basic equations, the results are not changed very much (Benjamin and Kochin, 1982, p. 416). It has, however, been pointed out that, using their own series, the inclusion of the observation for 1920 when the benefit to wage ratio was 0.15, is

inconsistent with their assumption of zero effect for the benefit to wage ratio below 0.27[1]. Though when this correction is made their result holds up, others have sought to exclude the observation for 1920 altogether[2].

Ormerod and Worswick (1980) and Irish (1980) find that when the first observation is removed and a trending variable included the coefficient a_1 loses its significance. Further tests indicated that the coefficients appeared to shift at 1930. Choice of different time periods for estimation appears to change the point estimate on the benefit to wage ratio quite substantially but, in their reply to Ormerod and Worswick (1982), Benjamin and Kochin argued that these shifts were not statistically significant structural breaks. (1982, p.414). Similarly in their original paper Metcalf et al. obtained a wide variety of coefficients for different data sets but concluded that "the effect estimated by BK could well be about right, although, ..., this would appear to have been more by luck than by judgement" (1980, p. 26).

Collins estimated a somewhat similar model on data on unemployment by industry finding the B/W coefficient to be insignificant in 9 out of 12 cases. These results are somewhat improved upon in a slightly different variant of the equation estimated by Benjamin and Kochin (1982 Table 2, p. 420-1). Cross, in his published comment, restricts himself

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[1] The effect of including the BW ratio at 0.15 in 1920 would be equivalent to having negative benefit induced unemployment in that year - a point now conceded by Benjamin and Kochin (1982, p. 415).

[2] Metcalf et al. have argued that both 1920 and 1921 should be excluded because the existence of the out of work donation scheme which provided generous benefits relative to those available on unemployment insurance means that the latter do not properly represent the average benefit rate (1982, p. 389).

to arguing that the administrative operation of the genuinely seeking work clause and the means test leave little scope for voluntary unemployment. Furthermore, variations in the way the scheme was operated are likely to have had more important effects on unemployment than variations in benefit rates. But if this were accepted, Benjamin and Kochin would seem to have obtained their results despite, rather than because of, institutional changes. Hence Cross argues that causality may run from increases in unemployment to improvements in the benefit regime rather than the other way round. But this seems implausible, at least in view of the events of 1931 when financial pressure on the insurance fund caused by rising unemployment, led to a cut in benefit rates.

While each of these writers suggest that the basic model is seriously deficient, they do not examine the theory lying behind it or offer alternative specifications derived from theory. In the interpretation of Benjamin and Kochin, the impact of benefits is held to arise in three distinct ways. First, the generosity of benefits lowered the cost of search and induced workers to search longer in expectation of a higher post-unemployment wage, or alternatively to search less intensively and use benefits to finance leisure. Second, employers, in an effort to maintain a work force whose current marginal product was less than the wage, could confer greater utility on their workforce by laying off each worker for a fraction of the year, allowing him to claim benefits for a spell, than they could by effecting the appropriate wage cut. Third, individuals who would not otherwise be in the workforce and had no desire to obtain employment, were induced to register in the hope or expectation of receiving benefits.

Thus Benjamin and Kochin's model is implicitly one of labour market equilibrium and they cite the earlier work of Maki and Spindler (1975, 1979) who give a diagrammatic exposition of the model underlying their estimating equation. This is a simple partial equilibrium model of supply and demand in a single market. The supply side is described by two curves S^E and S^A which are, for convenience, upward sloping. The former schedule gives the actual supply of workers to jobs at a particular point while the latter measures the total observed workforce. The difference between the two is the level of frictional unemployment and, hence, this may be regarded as a static version of the model discussed in Chapter 3.

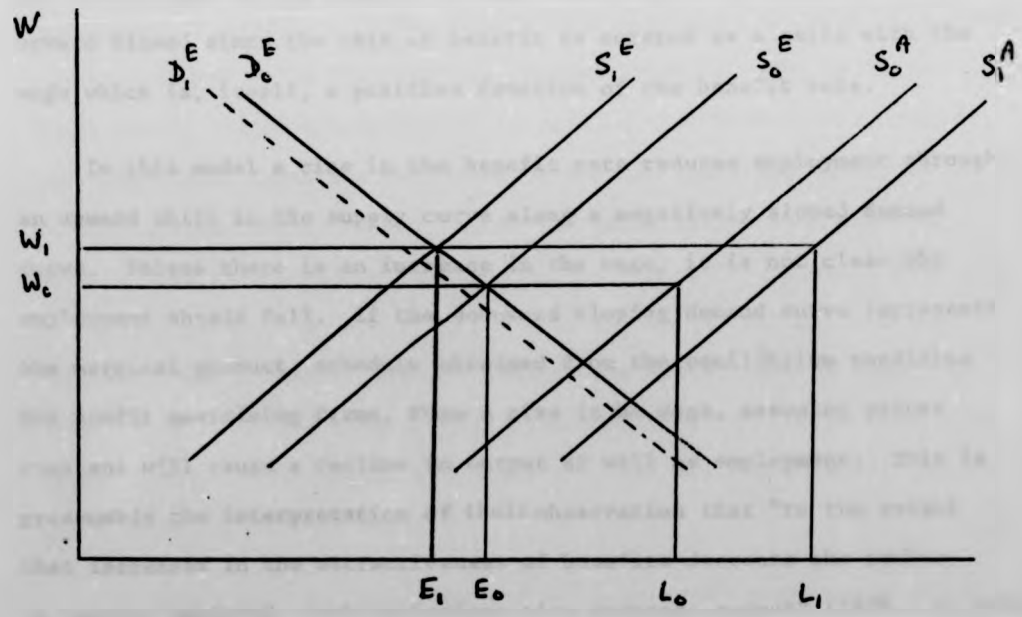

Figure 5.1

The diagram shows the initial equilibrium at an employment level E_o and unemployment $L_o - E_o$ at the clearing wage W_o. The impact of benefits in this model is to increase the size of the registered labour force at each wage shifting S_o^A to S_1^A and to shift S_o^E leftwards to S_1^E as workers are induced to search more or choose more leisure. Hence the unemployment level rises to $L_1 - E_1$ and the wage rate rises to W_1. Thus in the model of short run partial equilibrium there are two structural equations and two jointly determined variables. One of these is either employment or unemployment and the other is the wage rate. The Benjamin and Kochin model only has one equation and is not estimated using simultaneous equations methods. In terms of the equilibrium model, the coefficient on the benefit to wage ratio would be expected to be upward biased since the rate of benefit is entered as a ratio with the wage which is, itself, a positive function of the benefit rate.

In this model a rise in the benefit rate reduces employment through an upward shift in the supply curve along a negatively sloped demand curve. Unless there is an increase in the wage, it is not clear why employment should fall. If the downward sloping demand curve represents the marginal product schedule obtained from the equilibrium condition for profit maximising firms, then a rise in the wage, assuming prices constant will cause a decline in output as well as employment. This is presumably the interpretation of their observation that "to the extent that increases in the attractiveness of benefits decrease the number of persons employed, such variations also decrease output" (1979 , p. 464). Thus it might be argued that it is the wage and not output which should appear on the right hand side of their equation. This they rejected but only on finding that in an equation including output, the real wage was not significant.

The diagram shows the initial equilibrium at an employment level E_o and unemployment $L_o - E_o$ at the clearing wage W_o. The impact of benefits in this model is to increase the size of the registered labour force at each wage shifting S_o^A to S_1^A and to shift S_o^E leftwards to S_1^E as workers are induced to search more or choose more leisure. Hence the unemployment level rises to $L_1 - E_1$ and the wage rate rises to W_1. Thus in the model of short run partial equilibrium there are two structural equations and two jointly determined variables. One of these is either employment or unemployment and the other is the wage rate. The Benjamin and Kochin model only has one equation and is not estimated using simultaneous equations methods. In terms of the equilibrium model, the coefficient on the benefit to wage ratio would be expected to be upward biased since the rate of benefit is entered as a ratio with the wage which is, itself, a positive function of the benefit rate.

In this model a rise in the benefit rate reduces employment through an upward shift in the supply curve along a negatively sloped demand curve. Unless there is an increase in the wage, it is not clear why employment should fall. If the downward sloping demand curve represents the marginal product schedule obtained from the equilibrium condition for profit maximising firms, then a rise in the wage, assuming prices constant will cause a decline in output as well as employment. This is presumably the interpretation of their observation that "to the extent that increases in the attractiveness of benefits decrease the number of persons employed, such variations also decrease output" (1979 , p. 464). Thus it might be argued that it is the wage and not output which should appear on the right hand side of their equation. This they rejected but only on finding that in an equation including output, the real wage was not significant.

In an equilibrium model of the interwar period estimated by Mathews and Minford unemployment was specified as a function of the real wage, output and lagged unemployment and the real wage as a function of real benefits and unemployment (1981, pp. 5-6). These were estimated by two stage least squares and it was found that, in the absence of trending variables and in the presence of long lags the real benefit term in the real wage equation was significant. Even so, the elasticity was estimated at only 0.05 and 0.03 for alternative specifications. The real wage in turn was barely significant in the unemployment equation, though giving the right sign and implying elasticities between 1.3 and 3.9.

Benjamin and Kochin made a number of references to implicit contracts and temporary layoffs and they equate this with the operation of the OXO system referred to in the previous chapter (1979, p. 448, 450). In their recent response they stated in passing that "OXO systems were the single most important way in which the insurance system was exploited in the interwar period" (1982, p. 427). Thus, rather than hoarding workers with firm specific skills when their marginal products fell below the current wage, they could, under this system be laid off and the firm would run a smaller risk of losing them should they be needed for recall than if they did not qualify for benefits. The higher the level of benefits relative to wages, the lower the risk and the more willing firms would be to lay workers off.

In this case, the impact of a rise in benefits might be to shift the demand curve to the left at a given wage rate. This is illustrated in Figure 5.1 by the shift from D_o^E to D_1^E. This reduces the positive effect of benefits on the wage rate but will only leave the wage unchanged if D^E and S^E shift to the left coincidentally by the same amount. If

this effect occurred, then a change in the benefit rate would cause employment to fall at any given level of output. Thus at a given level of output, unemployment would increase both because of increased labour supply and decreased employment. It is not clear, however, how far such effects can be taken as representing the voluntary actions on the part of workers, particularly if involuntary unemployment was widespread.

5.2 Interwar Unemployment and Labour Market Disequilibrium

The use of a model implying labour market equilibrium by Benjamin and Kochin and subsequent writers has coloured the interpretation of the results. Thus they argued that interwar unemployment was not due to deficient demand and that "the unemployed of the late twenties and late thirties were pulled into unemployment, not pushed out of employment" and, more ironically that "[t]he army of the unemployed standing watch in Britain at the publication of the General Theory was largely a volunteer army" (1979, p. 474). Hence it is assumed that, for the most part, unemployment was voluntary and interwar unemployment is described using this as the maintained hypothesis. In what follows, it will be argued that this is not the appropriate assumption and that a model which views unemployment as involuntary provides a better paradigm for interpreting the interwar period.

The most obvious piece of evidence attesting to excess supply of labour is the unemployment rate itself. As has been indicated, among the insured population this averaged 13% from 1922 to 1931 and 16% from 1932 to 1938. It has been argued in the previous chapter that, on the evidence presently available, the insurance figures appear to be roughly comparable with the data on trade union unemployment before 1914 and that this comparison indicates unemployment rates between two and three times higher than before the war. From the evidence of the results in Chapter 3, it appear that pre-war unemployment varied around an equilibrium which was probably not higher than 5%. In view of the fact that there was no insurance system and no discernible effects from trade union benefits, this could be regarded as the long run equilibrium level unaffected by benefits as described by the $L_o - E_o$ in Figure 5.1[1].

[1] In their recent response to critics Benjamin and Kochin have explicitly accepted the comparision of the Trade Union and Insurance figures as legitimate (1982, p.423).

The issue then, is whether the higher levels of interwar unemployment can be attributed to the introduction of the insurance system causing an upward shift in unemployment analogous to the position $L_1 - E_1$ in Figure 5.1. Calculating counterfactual unemployment levels for the interwar period with the 1913 benefit to wage ratio, Benjamin and Kochin found that the average rate from 1920 to 1938 would have been between an upper bound of 9.3% and a lower bound of 6.7%.[1] Though this is still considerably higher than the average before 1914, it is argued in Appendix 5.1, in the light of further empirical evidence, that the way in which Benjamin and Kochin calculated these counterfactual rates is inappropriate even if the procedure itself is regarded as legitimate. If one takes their equation at face value, the natural rate of unemployment which is derived from it is 10.13% which is more than double the prewar average rate[2].

The comparision with the postwar period is even more striking and this aspect has been stressed by Metcalf et al. Adjusting the interwar data on to the same basis as that for the postwar period yields average rates of 10% for 1921 - 1938 compared with 1.45% for 1948 - 1965 and 3.91% for 1966 - 1980[3]. As they point out "in no year from 1922 to 1938 was unemployment lower than its highest postwar level"[4] (1982, p.387).

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[1] Metcalf et al. have argued that using the econometric equation to predict unemployment rates so far outside the sample range is not a legitimate procedure (1982, p. 395).

[2] This is obtained by taking the constant term from their equation (5.19) and adding the threshold benefit to wage ratio (0.27) times the coefficient on B/W (18.3).

[3] The adjustment to the interwar unemployment data is similar in magnitude to that of Feinstein discussed earlier. The averages of unemployment rates were calculated from Metcalf, Nickell and Floros (1981), Table 1 p. 45 and Department of Employment Gazette.

[4] If the recent rise in unemployment is taken into account, this is unfortunately no longer true.

Thus the gap is even larger and it is even less likely that this can be attributed to differences in the benefit to wage ratio. As Metcalf et al. show, on a similar basis of comparison, though benefit to wage ratios were somewhat lower in the 1950s, for most of the post war period they were at levels closely similar to those existing between the wars (1982, Table 1, p. 388).

Changes in the benefit to wage ratio cannot therefore account for differences in average unemployment rates in different periods. If the period before 1914 saw average rates near equilibrium levels, it is likely that the early postwar period was dominated by excess demand. Even if a figure as high as 4% is taken as an equilibrium value for the postwar years, this still leaves a shift of 6% unexplained.[1] This indicates that the interwar period should be interpreted as one of excess supply of labour and involuntary unemployment.

It could be suggested that higher interwar unemployment might be attributed not the level of benefits but to the generosity with which they were administered. The argument of Cross (1982) has already been noted in this context. Comparing the administration of the system with that in the postwar period, Metcalf et al. have concluded that "there is no question of the administration of the system being more generous in the interwar period" (1982, p. 374). This is given added support by the results of a Ministry of Labour enquiry of 1925 which examined a sample of claims which had been authorised but which were thought potentially doubtful. Those subsequently disallowed on the ground of "not genuinely seeking work" or not making reasonable efforts to obtain employment accounted for only 2.7% of the claims examined and, for males, only 1.3% (Bakke, 1931, pp. 85-86).

[1] In a paper on postwar unemployment, Batchelor and Sheriff (1979) found that the equilibrium unemployment rate was below 2% until 1970. After this disequilibrium shifts raised the rate consistent with fully anticipated inflation to about 4%.

On the basis of this and a number of other enquiries conducted by the Ministry together with a detailed study of the unemployed at Greenwich in 1931, Bakke concluded that "the behaviour of the unemployed in searching for new employment gives no evidence that the possibility of drawing unemployment benefit has retarded the efforts of the unemployed to get back to work. It has removed the cutting edge of the desperation which otherwise might attend that search" (1931, p. 143). Neither , on the whole, were the unemployed unsuited for, or in some way disabled from unemployment. In a detailed enquiry into a sample of the unemployed in York, Rowntree found that 76% "are fit and capable and eagerly looking for work" while 12% "are not making any strenuous efforts to find it and another 12% suffered from some degree of physical disability or old age[1] (1941, p. 44).

A more direct impression of excess supply could be gained by comparing the numbers unemployed with total vacancies outstanding but, unfortunately, vacancy stock data are not available for the period. One sample survey of vacancies in 1937 in the South and Midlands yielded "a figure of 2210 as the maximum of unsatisfied demand for labour in Great Britain and Northern Ireland as notified to the employment exchanges" (Beveridge, 1944, p. 88). In the survey month, the number unemployed exceeded 1.5 million. This yields an extraordinarily low ratio of vacancies to unemployment of about one seventh of one percent. Even if vacancies were under estimated by a multiple, it would not alter the picture of massive excess supply of labour.

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[1] Even among these Rowntree found that, under normal circumstances of labour demand, many would be employed though they would always be marginal workers.

If the evidence on vacancies is discounted, it might be argued that the interwar period was characterised by a high level of structural unemployment in which excess supply in some labour markets existed side by side with excess demand in others. In this case higher interwar unemployment represents a higher equilibrium or natural rate of unemployment. The findings of chapter 7 serve to cast doubt on whether structural imbalance was as serious an impediment to achieving higher levels of employment between the wars as is sometimes thought. At the cyclical peak of 1937 the lowest regional unemployment rates were in London and the South-East which, on the insurance figures had levels in excess of 6%. On the same measure the most fully employed county was Wiltshire with 3.8% and for major counties the lowest rate at an individual exchange was 1.4% - not appreciably lower than the national average for the early postwar years. Similarly at the industry level, the lowest rate recorded in 1937 was 2.8% for Scientific and Photographic Instruments and Apparatus. (Beveridge 1944, Table 5, p. 61, Table 36, pp. 324-327, Table 33, pp. 316-320). Thus even in low unemployment areas and industries there does not seem to have been significant excess demand for labour and what there was is dwarfed by massive excess supply in others.

A direct test of the market clearing against the non market clearing approach has been performed on aggregate interwar data by Irish and Winter. Though their tests did not reject the market clearing hypothesis, they nevertheless rejected it on other grounds and went on to specify and estimate a non clearing model which partitioned the sample into supply and demand side observations. The result indicated labour market equilibrium at an unemployment rate of about 10% (13% for insured workers only) and the years of excess demand were 1923-5, 1927-9 and 1937. Even so,

the finding that virtually all of the coefficients in the supply equation were insignificantly different from zero casts doubt on the view that employment was ever supply constrained. Accordingly, they concluded that "[i]t is quite possible that excess supply existed for the entire period" (1981, Table 3 and page 17).

Recent contributions in macroeconomics have examined the short run functioning of the economy when markets fail to clear and a number of expositions of the basic three markets model are available (Barro and Grossman, 1976; Malinvaud, 1977; Benassy, 1977; Stoneman, 1979; Casson, 1981.) Since real economies are not characterised by price setting by a Walrasian auctioneer or a process of recontracting before trading takes place, goods and services and, most importantly, labour might be expected to exchange at non-Walrasian prices. Since no seller or buyer is forced to trade more than he would wish, given the conditions facing him, markets transact the minimum of supply and demand, giving rise to either excess supply or demand. When one side of a market fails to realise the trades it would like, agents will take the implied rationing into account in forming their supplies and demands on other markets. Hence there is a distinction between 'notional' or unconstrained and 'effective' or constrained supplies and demands. The implications of this for the labour market can be examined with the aid of Figure 5.2.

This is a modified version of Figure 5.1 in which the labour market is described in isolation from the rest of the economy. The supply side is represented by supply curves S^E and S^A as before. On the demand side D^E is the demand curve as before and its downwards slope represents the unconstrained demand for labour; there is either excess demand or equilibrium in goods markets and firms can sell as much as they like and

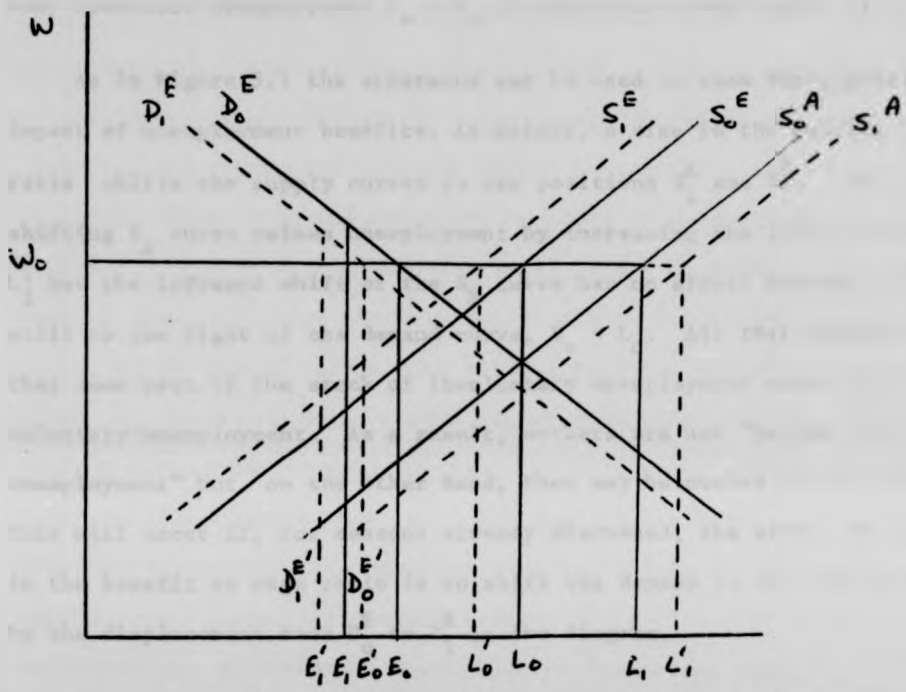

Figure 5.2

hence set employment and output in accordance with the marginal productivity condition. However, this may not clear the labour market and give rise to involuntary unemployment because of too high a wage rate. This is termed "Classical Unemployment". The vertical section of the demand curve $D^{E'}$ represents the case where firms are output constrained. Along this portion firms cannot sell all they would like and find themselves in a position where the marginal product of labour is greater than the wage. At prevailing prices and wages, there is excess supply in both product and labour markets and employment is determined by the

sales constraint. This is termed "Keynesian Unemployment". At the non-clearing wage W_o there is voluntary unemployment $L_1 - L_o$ and either involuntary Classical Unemployment $L_o - E_o$ or Keynesian Unemployment of $L_o - E_1$.

As in Figure 5.1 the apparatus can be used to show the possible impact of unemployment benefits. As before, a rise in the benefit to wage ratio shifts the supply curves to new positions S_1^A and S_1^E. The outward shifting S_A curve raises unemployment by increasing the labour force to L_1' but the leftward shift of the S_E curve has no effect because it is still to the right of the demand curve, $E_o < L_o'$. All that happens is that some part of the stock of involuntary unemployment moves into voluntary unemployment. As a result, workers are not "pulled into unemployment" but, on the other hand, they may be pushed out of employment. This will occur if, for reasons already discussed, the effect of a rise in the benefit to wage ratio is to shift the demand to the left as depicted by the displacement from D_o^E to D_1^E in the diagram.

In either of the regimes there is no reason why output should change due to direct labour market effects but, in Keynesian unemployment, there may be output effects coming through the product market. A rise in unemployment benefits at a given level of unemployment will worsen the government's budget deficit if it is not compensated by other changes in the accounts. This will add to aggregate demand in the standard Keynesian manner shifting the demand curve to the right, increasing employment and reducing unemployment. Hence the full macroeconomic effect of increasing unemployment benefits is ambiguous in the Keynesian regime and depends whether the direct shifts in labour supply and demand curves are outweighed by the implied demand expansion.

As has been indicated, benefits might have aggravated unemployment through the more indirect and longer term effect on wage rates. The result of an increase in benefits in Figure 5.2 is to raise voluntary unemployment by more than total unemployment. Thus if wage adjustments are related to excess demand or involuntary unemployment rather than total unemployment, there will be a tendency for wage rates to be maintained at levels higher than indicated by the level of measured unemployment. Alternatively, the effect of rising benefits may be more direct. The benefit level may enter directly into the wage bargaining process or indirectly by making unions more willing to stick out for higher wage rates. In Classical Unemployment higher wage rates will clearly worsen unemployment as demand will contract and supply may expand but, in Keynesian Unemployment, this will not necessarily hold. A rise in the wage rate will not reduce employment directly and, if it results in a shift in the income distribution towards those with higher propensities to consume out of current income, then by increasing aggregate demand employment may be raised.

Labour market excess supply appears to be a more attractive assumption upon which to build a model for the period in which Keynes wrote the General Theory. With this it becomes easier to understand many of the features of the interwar labour market which have already been discussed. The concentration of unemployment in specific industries and regions reflects higher levels of excess supply as the result of larger demand deficiency for the products of these industries and regions. The concentration of long term unemployment and its increase in the 1930s is the result of persistent demand deficiency. Differences in unemployment by age and sex can also be interpreted as the consequence of disequilibrium. If this is accepted, then cross-sectional comparisons of unemployment rates and benefit to wage ratios are meaningless.

5.3 A Model of Labour Market Disequilibrium for the Interwar Period

In this section we specify a model based on the assumption of labour market excess supply. The objective is to develop a set of equations with relatively simple functional forms which can be estimated on time series data. First the basic equations of the model are laid out and then the sets of structural equations relevant for Keynesian and Classical Unemployment are considered in turn.

The production function is based on that used by Ball and St. Cyr (1966):

$$Q = \alpha_o (EH)^{\alpha_1} e^{\alpha_2 t} \tag{5.2}$$

where Q is output, E is employment (number of workers) and t a time trend; α_1 is the returns to labour parameter and α_2 the growth coefficient reflecting the contribution of technical progress and capital stock accumulation. This function is preferred to the C.E.S production function in the present context because both the production function and the first order condition for profit maximisation are linear in logs. Furthermore this approach has been extensively used in the literature on employment functions discussed in the next chapter. The variable H is the labour utilisation rate (which is the complement of the rate of labour hoarding). When the labour market is in excess supply the non cyclical component of this is a positive function of the benefit to wage ratio. This is reflected in the simple function:

$$H = \alpha_3 \left(\frac{B}{W}\right)^{\alpha_4} \tag{5.3}$$

where α_3 and α_4 are both positive.

For aggregate demand, the following specification is adopted:

$$Q^D = \gamma_o \left(\frac{W}{P}\right)^{\gamma_1} Z^{\gamma_2} \tag{5.4}$$

where Z is a vector of exogenous variables determining demand. When demand is unconstrained, it is expected to be a positive function of the real wage. If demand is constrained, γ_1 may not be positive and the parameters represented by γ_2 will also be different.

Two other basic elements of the model are the labour supply equation and the wage adjustment equation. The measurable part of labour supply is apparent supply, equal to the observed labour force, L, specified as

$$S^A = L = \beta_o \left(\frac{W}{P}\right)^{\beta_1} \left(\frac{B}{W}\right)^{\beta_2} e^{\beta_3 t} \tag{5.5}$$

The sign of β_1 is ambiguous but that of β_2 is expected to be positive and the trend term with parameter β_3 which captures the secular growth of the potential labour force is also positive. The level of effective supply depends on apparent supply but also varies with the benefit to wage ratio such that

$$\frac{S^E}{L} = \partial_o \frac{B}{W}^{-\partial_1} \tag{5.6}$$

Equation 5.6 allows the ratio of labour demand to effective supply, E, which is the complement of the proportion of true excess supply or involuntary unemployment to be expressed in terms of observables - employment and the labour force

$$\frac{E}{S^E} = \partial_o^{-1} \left(\frac{E}{L}\right)\left(\frac{B}{W}\right)^{\partial_1} \tag{5.7}$$

The Phillips curve for the labour market is based on this modified excess supply variable but also includes two other components. One is price change which reflects the standard augmented Phillips curve and the other is the change in the unemployment benefit rate

$$\hat{W} = \varepsilon_o \left(\frac{E}{S^E}\right)^{\varepsilon_1} \hat{B}^{\varepsilon_2} \hat{P}^{\varepsilon_3} \tag{5.8}$$

where all the parameters are expected to take positive signs and a hat over the character denotes one plus the rate of change. Thus

$$\hat{W}_t = \left(\frac{W_t - W_{t-1}}{W_{t-1}}\right) + 1 = \frac{W_t}{W_{t-1}}$$

A similar approach is taken to the price equation in the case where prices fail to clear the product market so that price change depends on excess supply or demand and on actual or the expected change in wage costs

$$\hat{P} = \phi_o \left(\frac{Q^D}{Q^S}\right)^{\phi_1} \hat{W}^{\phi_2} \tag{5.9}$$

where ϕ_1 and ϕ_2 are positive.

Using these equations we can now set out the different sets of structural equations for employment, unemployment and wage and price change appropriate under each macroeconomic regime.

<u>Keynesian Unemployment</u>

In the Keynesian regime there is excess supply in both labour and product markets so that $E < S^E$ and $Q^D < Q^S$. Since firms are rationed as to the amount of output they can sell, employment is determined though the production function from (5.2) and (5.3) as

$$E = \alpha_o^{-1/\alpha_1} \alpha_3^{-1} Q^{1/\alpha_1} \left(\frac{B}{W}\right)^{-\alpha_4} e^{-(\alpha_2/\alpha_1)t} \tag{5.10}$$

Employment is determined by output and a time trend but also by the benefit to wage ratio if it affects employment through labour dishoarding or through temporary layoffs which will reduce the level of employment for a given level of output. The employment ratio obtained by dividing (5.10) by (5.5) is

$$\frac{E}{L} = \alpha_o^{-1/\alpha_1} (\alpha_3\beta_o)^{-1} \left(\frac{W}{P}\right)^{-\beta_2} Q^{1/\alpha_1} \frac{B}{W}^{-(\alpha_4+\beta_2)} e^{-(\alpha_2/\alpha_1+\beta_3)t} \tag{5.11}$$

Including the labour force equation increases the negative effect of the benefit to wage ratio and the sign on the real wage is ambiguous.

The Phillips curve for wage change is obtained by substituting equation (5.7) into (5.8) to give

$$\hat{W} = \varepsilon_o\partial_o^{-\varepsilon_1}\left(\frac{E}{L}\right)^{\varepsilon_1} \left(\frac{B}{W}\right)^{\partial_1\varepsilon_1} \hat{B}^{\varepsilon_2} \hat{P}^{\varepsilon_3} \tag{5.12}$$

Thus, given the rate of unemployment, wage change is a positive function of both the level of the benefit to wage ratio and the change in the nominal benefit rate. In the product market there is no observable proxy for excess supply but the notional output supply function can be obtained by taking first order conditions for profit maximisation subject to the production function which yields[1]

$$Q^S = \alpha_o^{1/(1-\alpha_1)} \alpha_1^{\alpha/(1-\alpha_1)} \left(\frac{W}{P}\right)^{-\alpha_1/(1-\alpha_1)} e^{(\alpha_2/(1-\alpha_1))t} \tag{5.13}$$

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[1] The benefit to wage ratio does not appear in this equation because, provided equation (5.3) is substituted into both the production function and the cost equation, it does not appear in the first order condition for output, though it does appear in that for employment.

Since demand is the short side, $Q = Q^D$ and the ratio of demand to supply is

$$\frac{Q^D}{Q^S} = Q\,\alpha_o^{-1/(1-\alpha_1)}\,\alpha_1^{-\alpha_1/(1-\alpha_1)}\left(\frac{W}{P}\right)^{\alpha_1/(1-\alpha_1)}\,e^{-(\alpha_2/(1-\alpha_1))t} \tag{5.14}$$

Equation (5.14) can now be substituted into (5.9) to give a price change equation in terms of observable variables

$$\hat{P} = \phi_o\,Q^{\phi_1}\,\alpha_o^{-\phi_1/(1-\alpha_1)}\,\alpha_1^{-\phi_1\alpha_1/(1-\alpha_1)}\left(\frac{W}{P}\right)^{\phi_1\alpha_1/(1-\alpha_1)}\,e^{-(\phi_1\alpha_2/(1-\alpha_2))t}\,\hat{W}^{\phi_2} \tag{5.15}$$

Price change is a positive function of the real wage since the higher the real wage the smaller is notional demand. It is also a positive function of actual output which represents effective demand.

Classical Unemployment

In the Classical regime there is excess supply in the labour market and excess demand in the product market so that $E < S^E$ and $Q^D \geq Q^S$. Since firms are not now faced with quantity constraints, they can sell as much as they wish so that output and employment are both decision variables obtained jointly from the first order conditions. Output will now be that given by the notional supply curve in equation (5.13) and the equation for employment is

$$E = (\alpha_o\alpha_1)^{1/(1-\alpha_1)}\,\alpha_3^{-1}\left(\frac{W}{P}\right)^{-1/(1-\alpha_1)}\left(\frac{B}{W}\right)^{-\alpha_4}\,e^{\alpha_2/(1-\alpha_1)t} \tag{5.16}$$

Since the production function always holds, equation (5.11), the Keynesian employment function is also legitimate though, in this case, output would be a jointly determined variable. The employment ratio derived from (5.16) and (5.5) is

$$\frac{E}{L} = (\alpha_o\alpha_1)^{1/(1-\alpha_1)}(\alpha_3\beta_o)^{-1}(\frac{W}{P})^{-(\beta_1+1/(1-\alpha_1))}(\frac{B}{W})^{-(\alpha_1+\alpha_4)}$$

$$e^{-(\beta_3-\alpha_2/(1-\alpha_1))t} \qquad (5.17)$$

Output does not appear in the equation and the real wage coefficient will be negative if the slope of the demand curve for labour outweighs any tendency for the labour supply curve to be backward bending; the effect of the benefit to wage ratio is the same as that in the Keynesian case equation (5.11).

Since the labour market is assumed not to clear, the structural form for the wage equation will be the same as equation (5.12) though, given the difference between (5.11) and (5.17) the reduced form will differ. In the price change equation, if the market does not clear, there is excess demand, $Q^D > Q^S$ and hence, supply is the short side so $Q = Q^S$ and demand is represented by the aggregate demand function equation (5.4). The ratio of supply to demand is therefore

$$\frac{Q^D}{Q^S} = Q^{-1}\gamma_o(\frac{W}{P})^{\gamma_1} Z^{\gamma_2} \qquad (5.18)$$

Substituting into (5.9) gives the price adjustment function

$$\hat{P} = \phi_o Q^{-\phi_1}\gamma_o^{\phi_1}(\frac{W}{P})^{\phi_1\gamma_1} Z^{\phi_1\gamma_2}\hat{W}^{\phi_2} \qquad (5.19)$$

Alternatively, if the product market is assumed to clear, then $Q^D = Q^S$ and equations (5.4) and (5.13) can be solved for the price level and the equation converted to changes to give

$$\hat{P} = e^{\frac{-\alpha_2/(1-\alpha_1)}{\gamma_1+\alpha_1/(1-\alpha_1)}}\hat{Z}^{\frac{\gamma_2}{\gamma_1+\alpha_1(1-\alpha_1)}}\hat{W} \qquad (5.20)$$

In this case price change is a function only of the variables determining aggregate demand and the non-clearing wage.

Before reviewing estimates of the model specified in this section on interwar data, it is useful to draw some comparisons with the model estimated for the prewar period in Chapter 3. In that case labour market equilibrium was assumed while the present model assumes disequilibrium. No attempt is made to test between these hypotheses, partly because of the inherent difficulty of so doing but also because strong a priori arguments have been advanced for viewing the two periods differently. Thus the inferences drawn from the results in each case are largely, though not entirely, a matter of interpretation rather than testing the values of particular coefficients.

In some respects the models are quite similar though there are important differences. In each case labour demand is determined through the production function but a different function is used in the present context to sharpen the distinction between the Classical and Keynesian cases. Similarly in each case there is an equation relating unemployment to wage change though, in the present context, it is viewed as a traditional Phillips curve type adjustment function. In estimation adjustment of both wages and prices are assumed to depend on excess demand lagged one period to emphasise the characteristic of disequilibrium. Leaving aside these distinctions, the model could be interpreted in the manner of Chapter 3 but in order to support the equilibrium view, it would have to be shown that significant coefficients could be estimated for the Phillips relation. If not, then the interpretation of this as a Classical labour supply function is ruled out and the wage has to be regarded as determined by forces other than those which are thought of as fixing the short run labour market equilibrium.

5.4 Estimates for the Interwar Years

Before proceeding to the estimation of the equations of the previous section it is necessary to specify the truly exogenous variables appearing in the vector Z. While it is possible to offer alternative specifications of how these variables might affect the key magnitudes in the labour market it is impossible to be agnostic about the variables themselves. In order to take account of competing theories, three key variables are selected as being, either individually or jointly, the motive forces in fluctuations between the wars. These are real investment expenditure, the nominal money supply and a volume index of world trade. World trade was preferred to exports because of the obvious endogeneity arising from domestic price movements but the other two variables are probably at least partly endogenous. However, feedbacks from changes in activity on prices are likely to have been relatively small in the short run which adds some support to their validity as exogenous variables in estimating equations. The other exogenous variables in the model are the average unemployment benefit rate, and a time trend.

Annual estimates for the UK 1920-38 on output investment, employment and the labour force and wages and prices were taken from Feinstein[1]. The nominal money supply (M1) was taken from Sheppard and the index of world trade from the League of Nations extended back to 1921 on the basis of Lewis's estimates.[2]

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[1] Feinstein (1972). GDP output estimate from Table 6, p. T119; Gross Domestic Fixed Capital Formation, Table 5, p. T14; Employment and Working Population, Table 57, p. T126; GDP Deflator, Table 61, p. T133; Wage Rates Table 65, p. T140.

[2] League of Nations (1938) p. 60 Lewis (1952), Table 1 p. 106-7.

In estimating the equations it is possible using the appropriate techniques to estimate reduced forms, quasi reduced forms or structural equations. In the model of the previous section emphasis is placed on alternative structural equations which may not be easily distinguishable as reduced forms and hence as far as possible structural equations are estimated. For some equations the estimating technique depends on the true structure since in some cases there will be feedbacks from right hand side variables and in others not. Each equation is therefore estimated by instrumental variables and the instruments are restricted to those variables discussed above that would be exogenous in any version of the model. In equations estimated in levels only the current values of these variables was used while in wage and price equations specified in changes, current and lagged values were used. We turn first to examine the structural relations characterising the Keynesian regime.

Keynesian Unemployment

Equations 5.10, 5.11, 5.12 and 5.15 form the Keynesian system and these are converted to estimating equations by taking logs and adding the stochastic error term. Thus the equations to be estimated are

$$\ln E_t = a_0 + a_1 \ln Q_t + a_2 \ln(\tfrac{B}{W})t + a_3 t + u_1 t \tag{5.21}$$

$$\ln(\tfrac{E}{L})t = b_0 + b_1 \ln Q_t + b_2 \ln(\tfrac{W}{P})t + b_3 \ln\tfrac{B}{W}_t + b_4 t + u_{2t} \tag{5.22}$$

$$\Delta\ln W_t = c_0 + c_1 \ln(\tfrac{E}{L})_{t-1} + c_2 \ln(\tfrac{B}{W})_t + c_3 \Delta\ln B_t + c_4 \Delta\ln P_t + u_3 t \tag{5.23}$$

$$\Delta\ln P_t = d_0 + d_1 \ln Q_{t-1} + d_2 \ln(\tfrac{W}{P})_{t-1} + d_3 t + d_4 \Delta\ln W_t + u_4 t \tag{5.24}$$

The expected signs on the variables in these equations are the following: $a_1 > 0$, $a_2 < 0$, $a_3 < 0$. $b_1 > 0$, $b_2 \gtrless 0$, $b_3 < 0$ $b_4 \gtrless 0$, $c_1 > 0$, $c_2 > 0$, $c_3 > 0$, $c_4 > 0$, $d_1 > 0$, $d_2 > 0$, $d_3 < 0$, $d_4 > 0$.

The results of estimating these equations over the years 1921-38 for the levels equations and 1922-38 for equations in changes are given in Table 5.1. The output constrained employment function gives a good fit, is free of serial correlation and all variables give the expected sign. The output term is highly significant but exhibits the common result that the short run returns to labour coefficient α_1 is significantly larger than one which, in terms of the simple specification adopted, is inconsistent with the possibility of a downward sloping demand curve for labour. This tends to support the view that employment was output constrained and that some of the variation in output was met by changing the utilisation rate of employed labour. It is also consistent with the strikingly significant coefficient on the benefit to wage ratio which gives a t value of 5.6. The result is even more surprising if the coefficient is used to estimate the reduction in employment resulting from the rise on the benefit to wage ratio from 1921 to its peak in 1935. Evaluated at the sample means, this suggests that employment fell by over 1.8 million which would account for three quarters of the unemployment existing in 1935, considerably in excess of the maximum proportion suggested by Benjamin and Kochin[1]. Given the small coefficient on the time trend, it was thought that differential values of growth of productivity or in the capital stock between the 1920s and 1930s might have been picked up by the benefit to wage ratio and so a time trend dummy was introduced at 1930. This only served to further raise the coefficient on the benefit to wage ratio and reduce that on the time trend.

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[1] Benjamin and Kochin concentrated only on the insured population while the present estimates use Feinstein's data which covers both insured and uninsured though, as they pointed out (1979, p.452) the unemployment percentage for the former, while substantially higher, is closely correlated with the Feinstein estimate for the aggregate.

Table 5.1

Estimated Equations for Keynesian Unemployment

Dependent Variable	Constant	$\ln Q_t$	$\ln (\frac{W}{P})_t$	$\ln (\frac{B}{W})_t$	t	S.E.E.	$\bar{R}^2$	D.W.
$\ln E_t$	6.4874	0.7026		-0.1389	-0.0032	0.0083	0.9769	1.9836
	(0.3160)	(0.0682)		(0.0249)	(0.0014)			
$\ln (\frac{E}{L})_t$	-3.9521	0.7578	-0.1026	-0.0621	- 0.0157	0.0079	0.9327	2.4382
	(2.1945)	(0.0674)	(0.5363)	(0.0310)	(0.0055)			

Dependent Variable	Constant	$\ln (\frac{E}{L})_{t-1}$	$\ln (\frac{B}{W})_{t-1}$	$\Delta \ln B_t$	$\Delta \ln P_t$	S.E.E	$\bar{R}^2$	D.W.
$\Delta \ln W_t$	-0.0853	-0.1113	-0.0877	-0.1092	1.2466	0.0142	0.9125	2.0802
	(0.1566)	(0.1342)	(0.1614)	(0.2065)	(0.4661)			

Dependent Variable	Constant	$\ln Q_{t-1}$	$\ln (\frac{W}{P})_{t-1}$	t	$\Delta \ln W_t$	S.E.E.	$\bar{R}^2$	D.W.
$\Delta \ln P_t$	0.6410	0.1810	0.3458	-0.0054	0.7466	0.0074	0.9763	2.2058
	(1.4765)	(0.0552)	(0.3343)	(0.0034)	(0.0632)			

In the employment ratio equation the coefficient on output is about the same and the real wage term, though giving the expected sign, is not significant, which suggests an inelastic labour supply schedule. Surprisingly, the size and significance of the coefficient on the benefit to wage ratio is reduced to about half its value in the employment ratio equation. Hence the measured effects of the benefit to wage ratio on unemployment appears to arise mainly on the demand side and to be partially offset or masked by perverse movements on the supply side. The net effect on unemployment of the rise in the benefit to wage ratio from 1921 is now to raise unemployment in 1935 by nearly four percentage points for the labour force as a whole. Though this result is broadly consistent with those of Benjamin and Kochin, they did not examine supply and demand for labour separately and the finding that the measured effects of the unemployment benefits arises on the demand side run directly counter to their supply side interpretation.

The wage equation is much less satisfactory although a high level of explanatory power is obtained and the equation is free of serial correlation. The employment ratio gives the wrong sign as do the benefit terms and all three are insignificant. Only the price term gives a significant coefficient which is substantially larger than one. Some experimentation was undertaken to see if these results were sensitive to alternative specifications. In particular the benefit terms were eliminated separately and together but none of the remaining variables with the exception of the price term took a significant coefficient. The equation was also run beginning in 1923 and 1924 to see if other effects were being swamped by the sharp simultaneous decline in wages and prices at the beginning of the period: this also failed to alter the results substantially.

The price equation is more in accord with expectation and all variables give the expected sign. The output term is highly significant and its coefficient gives an estimate of the slope of the price adjustment function which appears to be relatively flat. The other terms are not significant but the point estimates give highly plausible orders of magnitude.

Classical Unemployment

In the regime of Classical Unemployment the equations are those for employment and the employment ratio, (5.16) and (5.17) and the two alternative price equations, (5.19) and (5.20). The wage equation is also included in this regime but since it is identical to that for the Keynesian case, it need not be re-estimated. As before these equations were converted to estimating form by taking logs and adding the stochastic error term.

Thus the estimating equations are as follows

$$\ln E_t = a'_o + a'_1 \ln \frac{W}{P} + a'_2 \ln(\frac{B}{W}) + a'_3 t + u'_{1t} \tag{5.25}$$

$$\ln(\frac{E}{L})_t = b'_o + b'_1 \ln(\frac{W}{P}) + b'_2 \ln \frac{B}{W} + b'_3 t + u'_{2t} \tag{5.26}$$

$$\Delta\ln P_t = d'_o + d'_1 \ln Q_{t-1} + d'_2 \ln(\frac{W}{P})_{t-1} + d'_3 \ln I_{t-1} + d'_4 \ln M_{t-1} + d'_5 \ln WT_{t-1} + d'_6 \ln W_t + u'_3 t \tag{5.27}$$

$$\Delta\ln P_t = e_o + e_1 \Delta\ln I_t + e_2 \Delta\ln M_t + e_3 \Delta\ln WT_t + e_4 \Delta\ln W_t + u'_{4t} \tag{5.28}$$

The expected signs on the coefficients are as follows:

$a_1' < 0 \quad a_2' < 0 \quad a_3' > 0, \; b_1' < 0 \quad b_2' < 0 \quad b_3' \gtrless 0,$

$d_1' < 0 \quad d_2' < 0 \quad d_3' > 0 \quad d_4' > 0 \quad d_5' > 0, \; d_6' > 0,$

$e_1 > 0 \quad e_2 > 0 \quad e_3 > 0 \quad e_4 > 0.$

The results obtained from estimating these equations using instrumental variables are given in Table 5.2.

The employment equation is much less satisfactory than its equivalent in Table 5.1 and the low Durbin Watson statistic reflects the failure of the equation to pick up the decline and recovery of employment in the early 1930's. Despite the finding of increasing short-run returns to employment in the earlier equation, the demand curve appears to be downward sloping though the coefficient is not significant and the effects of the benefit to wage ratio disappears altogether entering insignificantly with the wrong sign. As might be expected, these results are largely reflected in the employment ratio equation. The real wage term continues to take the expected sign but, this time, the size of the coefficient on the benefit to wage ratio increases as the supply side interpretation would predict though it remains insignificant.

The disequilibrium price equation is also less satisfactory than its equivalent in Table 5.1. This time the coefficient output is predicted to be negative but is positive and insignificant. Among the demand variables, the real wage takes a strikingly large and significant coefficient but all the other terms are small and insignificant with world trade giving the wrong sign. The wage change term gives a similar coefficient to that in the alternative equation though its significance is reduced. The strength of this relationship is increased in the equilibrium price equation as is the size of the

Table 5.2

Estimated Equations for Classical Unemployment

Dependent Variable	Constant	$\ln (\frac{W}{P})_t$	$\ln (\frac{B}{W})_t$	t	S.E.E.	$\bar{R}^2$	D.W.
$\ln E_t$	3.0573	-1.5872	0.0231	0.0245	0.0275	0.7431	1.0903
	(7.6081)	(1.8090)	(0.0945)	(0.0169)			
$\ln (E/L)_t$	-7.0914	-1.6813	0.1084	0.0130	0.0339	-0.2445	1.0311
	(9.3586)	(2.2252)	(0.1163)	(0.0208)			

Dependent Variable	Constant	$\ln Q_{t-1}$	$\ln (\frac{W}{P})_{t-1}$	$\ln I_{t-1}$	$\ln MT_{t-1}$	$\ln WT_{t-1}$	$\Delta \ln W_t$	S.E.E.	$\bar{R}^2$	D.W.
$\Delta \ln P_t$	-1.5214	0.1711	1.0701	0.0281	0.0202	-0.0055	0.8407	0.1098	0.9474	2.6381
	(1.1685)	(0.2237)	(0.4236)	(0.1051)	(0.2163)	(0.0781)	(0.2922)			

Dependent Variable	Constant	$\Delta \ln I_t$	$\Delta \ln M_t$	$\Delta \ln WT$	$\Delta \ln W_t$	S.E.E.	$\bar{R}^2$	D.W.
$\Delta \ln P_t$	0.0033	-0.1294	-0.1104	0.0784	1.1751	0.0119	0.9383	2.1746
	(0.0042)	(0.0638)	(0.0886)	(0.0593)	(0.1212)			

coefficient and it is the dominant variable in the equation. Of the three demand variables, two give the wrong sign, one with a significant coefficient.

Inevitably, the results do not provide unambiguous support for one specification and reject another. For employment and unemployment, the output constrained equations appear to be superior but, by itself, this does not indicate that classical unemployment can be ruled out. Given that there is some evidence of a downward sloping demand curve for labour, it is possible that, at times, a classical regime existed while, at other times, employment was output constrained. However, the finding of increasing short run returns to labour tends to cast doubt on the possibility of a downward sloping demand curve. Moreover, the finding that the benefit to wage ratio is only important in the equations when output is included and that its impact appears to be on the employment side casts serious doubt on the equilibrium view.

Under the assumption of disequilibrium price adjustment, the hypothesis of excess demand or supply in the product market can, in principle, be tested by looking at the sign on output. On this criterion the equations offer more support to the Keynesian view and the evidence of an upward sloping notional supply curve, though not significant, is consistent with the results obtained for employment. However, in the alternative equation, there are four separate activity terms and the insignificance of the coefficients may reflect the problem of multicollinearity. The most consistent result arising from the wage and price equations is the very strong relationship between wage and price change. This is the only significant relationship emerging in the wage equation which is decisive in rejecting any impact of unemployment benefits on the change in or level of wages or any effect of excess supply. Given

this close relationship, it is hard to untangle the true direction of causation though, given the estimating technique, the equations should be free of this ambiguity. Overall the results suggest real wage rigidity with prices and through this, nominal wages responding to variations in output.

5.5 Interwar Unemployment and the Keynesian Solution

It has been argued so far that the evidence from the interwar labour market indicates labour market excess supply. Of the two possible macroeconomic regimes, the evidence is consistent with, or at least does not contradict, the view that Keynesian Unemployment existed. This suggests that policy activism to reflate the economy and make up for deficient demand might have been appropriate. Central to the traditional model of generalised excess supply is the consumption function. Under Keynesian Unemployment workers are constrained in the labour market and consumption depends largely on the constraint of current income. In these circumstances, it might be expected that the relation between consumption and current income would be closer than at other times when workers would not have faced a constraint on current labour supply and when they may have faced constraints in the product market. We turn first to examining estimates for the consumption function before considering values for the expenditure multiplier.

The Consumption Function

Two models of consumption are considered. The first is a traditional type of consumption function which allows for different propensities to consume out of different classes of income. The obvious distinction is between wage and salary income on one hand and non-labour income on the other. In the short run the propensity to consume would be expected to be higher out of income from employment both because of the lower income levels of workers and because the constraint of employment would affect their income more than non-labour income recipients.

The model to be estimated was taken in the following ratio form

$$\frac{C_t}{Y_{D,t}} = \psi_o \frac{1}{Y_{D,t}} + \psi_1 + \psi_2 \frac{Y_{WD,t}}{Y_{D,t}} + u_{5,t}$$

where C = total consumption expenditure, Y_D = total disposable income and Y_{WD} = disposable wage and salary income all deflated by the implicit price index for consumption. The parameter ψ_o is the constant term, ψ_1 the marginal propensity to consume out of non-labour income and ψ_2 the difference expected to be positive between the marginal propensities to consume out of labour and non-labour income.

Annual data used in estimation were taken from Feinstein and the model was estimated over the years 1921-1938 by instrumental variables using domestic capital formation, exports of goods and services and a time trend as instruments[1]. This gave the following result (standard errors in parentheses).

$$\frac{C_t}{Y_{D,t}} = \underset{(29.536)}{405.305} \frac{1}{Y_{D,t}} + \underset{(0.083)}{0.665} + \underset{(0.126)}{0.195} \frac{Y_{WD,t}}{Y_{D,t}}$$

$$\bar{R}^2 = 0.921 \quad \text{R.S.S.} = 0.0006 \quad \text{D.W.} = 1.679$$

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[1] Consumer's expenditure and total personal income are from Feinstein (1972), Table 10, p. T28. Disposable wage and salary income was obtained by subtracting employees' contributions for unemployment and health insurance calculated from the same tables from gross wage and salary income in Table 21 p. T55. Y_{WD} will be overestimated to the extent that these incomes were liable to direct tax but this would be relatively small in magnitude and would tend to bias ψ_2 downwards. Gross domestic capital formation and exports of goods and services in constant prices which are used as instruments are from Table 5, p. T15-16

As expected the equation gives a good fit and, although the coefficient ψ_2 is not significantly different from zero on the t test at the 5% level, it is easily significant at the 10% level. Furthermore, the equation yields extremely plausible estimates of the marginal propensities to consume, 0.665 for non-labour income and 0.86 for income from employment.

An alternative formulation is based on the permanent income approach in which current consumption is related to a distributed lag of current income. In ratio form,the function to be estimated is as follows

$$\frac{C_t}{Y_{D,t}} = \psi'_o \frac{1}{Y_{D,t}} + \psi'_1 + \psi'_2 \frac{C_{t-1}}{Y_{D,t}} + u'_{5t}$$

The definitions of the data are the same as those used earlier. In this case ψ'_o is the constant term, ψ'_1 is the short run marginal propensity to consume, and ψ'_2 is the partial adjustment paramater, $1 - \psi'_2$ is the proportion of adjustment occurring in the current year and the long run marginal propensity is $\frac{\psi'_1}{1-\psi'_2}$. The result for this equation was as follows:

$$\frac{C_T}{Y_{D,t}} = \underset{(48.411)}{322.480} \frac{1}{Y_{D,t}} + \underset{(0.051)}{0.691} + \underset{(0.070)}{0.140} \frac{C_{t-1}}{Y_{D,t}}$$

$$\bar{R}^2 = 0.918 \quad R.S.S = 0.0007 \quad D.W = 1.333$$

The overall fit is not improved over the earlier equation and the Durbin Watson statistic is lower though it will be biased upwards in the presence of a lagged dependent variable. This will tend to bias the standard errors downwards but, even so, the lagged term is only marginally

significant at the 5% level. Bearing in mind these qualifications, the result suggests that about 85% of adjustment comes in the current year - a result which is consistent with the view that consumption was largely determined by the constraint of current income. The short run m.p.c. of 0.69 is substantially higher than that usually obtained in this type of consumption function .

The Expenditure Multiplier

There have been two prominent attempts recently to calculate values for the standard Keynesian expenditure multiplier which use the two different versions of the consumption function estimated above. Most recently Glynn and Howells have argued that serious doubt must be cast on "the feasibility during the early 1930s of the 'Keynesian Solution' granted the validity of orthodox Keynesian concepts" (1980, p. 30). The argument was based on the finding that the multiplier was low and that the large deficits which would have been necessary to make any significant impact on unemployment would have caused a collapse of confidence which might offset any direct stimulus to demand.

To demonstrate this they went to considerable lengths to obtain a value for the multiplier by taking values of the relevant propensities from various sources "making generous allowances in favour of the Keynesian case". This yielded an upper bound estimate of 1.26 which, as they point out is considerably lower than the values estimated by comtemporaries which ranged between 1.5 and 2 and which have gained a wide measure of acceptance (1980, pp. 35-41). Their values of the marginal propensities for the two income classes were taken from Radice which were 0.64 to 0.70 for non-labour income and 0.90 to 0.925 for

income from employment. These are close to those obtained above and appear realistic though perhaps not excessively generous. However, their value for the marginal propensity to import which they take as 0.355, appears to be rather high. In the econometric model estimated by Thomas , this is estimated at 0.21 which seems a rather more plausible value (1975, p. 4). If this is substituted into their expression for the multiplier, its value rises to 1.49[1].

In his somewhat more sophisticated approach, Thomas estimated a full Keynesian econometric model of the interwar economy (1975, 1981). This gave an impact multiplier of only 0.98 and a long run multiplier of 1.44 which neatly brackets the estimate of Glynn and Howells. In his permanent income type consumption function, the short run m.p.c. is only 0.443, significantly lower than the value estimated above, though given the larger coefficient on lagged consumption, the long run m.p.c. is similar at about 0.8. The main reason that such low estimates are obtained, however, appears to be that first round expenditure effects feed only slowly and partially into disposable income. In

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[1] The expression for the multiplier they use is (in their notation)

$$k = \frac{1}{1 + \frac{u}{p} - (c-m)(1-t)}$$

where c and m are marginal propensities to consume and import, t is the marginal tax rate, u is per capita unemployment benefit and p average output per capita. Substituting in the chosen values gives

$$k = \frac{1}{1 + \frac{50}{241.65} - (0.84 - 0.355)(1 - 0.15)} = 1.26$$

particular, profits respond only gradually to expenditure changes and, by assumption, income from self employment does not respond at all. In turn profits feed only slowly into investment and, as with wages, only gradually into consumption.

Glynn and Howells take their text for the'Keynesian Solution'from Keynes open letter to President Roosevelt of 1933. While this does not embody a specific set of proposals for reflating the British economy, they take the definition of the 'Solution' to be the indiscriminate expansion of expenditure through public works schemes in order to return the economy to full employment. Thus taking their estimate for the multiplier of 1.26, they calculate the injection which would have been required to produce 2.8 million man years of employment which is the total of insured employment in 1932. This gives the result of £537 million. There is no disputing that this is an enormous sum but it must be remembered that 1932 was the most depressed interwar year. According to their model, the policy of spending would have transformed it into what, by interwar standards, would have been a massive boom comparable with that of 1919-20. This seems to be deliberately unfavourable to the Keynesian case.

By contrast, Thomas used his model to evaluate the implications of the rather more modest proposals put forward by Lloyd George and supported by Keynes and Henderson in 1929. Both Thomas and Glynn and Howells interpret the results as showing that the proposals would not have succeeded. According to Thomas's simulations, if a £100 million public works programme had been started in 1929 and continued henceforward, employment would only have risen by 350,000 in 1932. With total unemployment standing at 3.4 million in that year, it would not

have done much to eradicate the depression though it would have been a useful addition to employment. But these proposals were put forward in 1929 when total unemployment was only 1.5 million and, even then, it was only envisaged that it would fall by half a million. To produce this would have required an expenditure multiplier of 1.8 using Thomas's employment function and 1.2 using Glynn and Howells' assumed value for labour productivity.

Proceeding with their counterfactual exercise, Glynn and Howells examine the implications of the £537 million public spending programme. They argue that, given the planned budget balance for 1932 with totals of £766 on either side of the accounts, "a national budget deficit of £537 million would have required an increase in spending or a decrease in revenue of 70 per cent" (1980, p. 42). While the statement is arithmetically correct, the idea that the £537 million spending programme would cause an equivalent deficit is totally mistaken. According to their own model, the tax yield would have increased by £101.5 million and the improvement in the insurance fund (ignoring the increase in contributions) would have been £140 million. Thus, even leaving aside all the other endogenous components of the accounts, the deterioration in the budget, including the insurance fund (which was regarded as outside the budget but still had to be financed) would have been little more than half the figure they use. It is odd that this aspect is played down since built-in stabilisation is one reason why such low values for the multiplier are obtained.

The response of the budget to variations in income has recently been examined in detail by Middleton (1981). The central government accounts were first adjusted on to a consistent basis by bringing in the social insurance funds and items of capital expenditure and adjusting

for "fiscal window dressing". The accounts were then fully endogenised to calculate the "macromarginal budget rate" which is the ratio of the change in the budget surplus to the change in GDP (which is assumed to originate in the private sector). For fiscal year 1931/32 this was calculated at 0.44 and similar values were obtained for other years (1981, Table 4, p. 76). The following table uses this value for illustrative calculations which show the impact of a £100 million public spending programme.

Table 5.3

Effects of £100 million Public Spending Programme

(1) Multiplier	(2) Income change (£m)	(3) Change in Budget Deficit (£m)	(4) Employment change 000's	
			(a)	(b)
1.00	100	56	276.5	413.8
1.25	125	45	345.6	517.3
1.50	150	34	414.8	620.7

With a multiplier as low as one the budget deficit would rise by over half the amount of expenditure but with a value of 1.5, it would only rise by a third of it. The employment effects are calculated in a column 4 where (a) uses Thomas's employment function and (b) Glynn and Howells' productivity figure. Depending on the assumptions chosen, the effect of the programme varies between 300 and 600 thousand of additional employment. In terms of the number of man years of employment which could be bought for every £1 million of loan financed deficit, even the most pessimistic outcome is only slightly worse than the picture painted by Glynn and Howells, while the most optimistic is nearly three and a half times better.

Concluding their paper, Glynn and Howells argued that irrespective of the actual value of the multiplier, even a relatively small deficit

of £50 million or so would have undermined public confidence so as to offset any induced effects of the spending programme. (1980, pp. 42-44). In fact, when the budgetary accounts are adjusted to accord with established accounting principles, it emerges that deficits in the neighbourhood of £50 million did occur in fiscal years 1931/32 and 1932/33 (Middleton, 1981, Table I, p. 58). They point to the debacle of 1931 as evidence of the likely effects on confidence of a potentially large deficit. However, the loss of confidence which occurred then was a fear that the gold standard would be jeopardised, not that domestic demand would be impaired. Once sterling had left gold, the crisis rapidly subsided. Furthermore, the measures which were taken, the imposition of a revenue tariff and the establishment of the Exchange Equalisation Account to manage the sterling exchange rate virtually amounted to a revolution in economic policy. Yet it is not suggested that these measures caused a collapse of confidence which made entrepreneurs unwilling to invest and consumers unwilling to consume, indeed quite the reverse.

It is clear that, in an open economy such as interwar Britain, any domestic expenditure policy would have consequences for the balance of payments and/or the exchange rate. Similarly any exchange rate policy would directly affect domestic economic activity and we turn to these issues next.

5.6 Exchange Rate Policy and Unemployment

Though unemployment rates were, on average, higher in the 1930s than the 1920s, by comparison with other industrialised countries, it is the 1920s which stands out as the decade of high unemployment. Almost all countries suffered from the world depression of the early 1930s and the subsequent slow and incomplete recovery from it later in the decade. Even the war torn economies of continental Europe after the severe monetary disorders and problems of reconstruction in the early 1920s achieved relatively high levels of employment later in the decade. The widely accepted explanation for this is that overvaluation of the period hindered export expansion, further exacerbating the competitive weakness of the staple industries.

In 1918, the influential Cunliffe Committee set the course for a return to monetary orthodoxy and towards the restoration of the gold standard, viewing these as essential conditions for the return of stability and prosperity. During the immediate postwar inflation, the exchange rate against the dollar fell to a low point of $3.20 in February 1920 but, in the sharp monetary and fiscal contraction that followed, wages and prices fell simultaneously and the exchange rate rose to average $4.62 in 1922. From then on it maintained an average level of about 90% of the prewar parity of $4.86. With the election of a conservative government late in 1924, the exchange rate rose further on expectations of a resumption of the gold standard and, in April 1925, Churchill announced a return to gold at the old parity of $4.86.

Returning to fixed exchange rates at any other parity was never seriously considered and any return to gold was thought synonymous with the old parity. This brought forth a polemical response from Keynes

(1931) who, in a pamphlet entitled 'The Economic Consequences of Mr Churchill', argued that the pound was overvalued at $4.86 and an exchange rate of $4.40 would have been more realistic. This provided the starting point for a debate which has echoed on ever since but much of the argument has surrounded the issue of why the decision was taken when it was, and what the main motives lying behind it were. Keynes argued that Churchill had simply been misled by his advisors and had acted impulsively (1931, p. 30). Considering it from a greater distance, Sayers found that "[I]n fact it was an exceptionally well considered step" (1957, p. 88). With the benefit of official documents, Moggridge has shown that, though a great deal of discussion took place, there was very little consideration of what the economic consequences might be, even though it was recognised that British prices were still higher than those of the U.S. relative to 1913 (1969, 1972, Ch. 3). An interpretation favoured by Pollard (1970) is that among those who had a voice, such as the Bank of England, financial interests predominated over those of industry and trade though this has recently been criticised on the grounds of taking too narrow a perspective (Tomlinson, 1981, Ch. 7).

Much attention, though little quantitative work, has been addressed to the question of what the consequences of an exchange rate of $4.40 might have been, compared with $4.86. Much of this followed the lead of Keynes in comparing domestic and foreign prices compared with 1913 as a measure of the necessary price deflation which would have been needed to relieve the persistent pressure on the balance of payments. Though these in general indicate a relative price disadvantage of 5% or 10%, it should be pointed out that the relative prices of 1913 would not necessarily be the appropriate ones for 1925, given the difficulties of the staple industries, the lack of growth in world trade and the loss

of earnings from overseas assets liquidated during the war (Moggridge, 1972, pp. 98-106).

Considerable doubts have been raised as to whether a lower exchange rate would have provided much relief to the balance of payments. According to Sayers a return to fixed exchange rates of itself provided a stimulus to world trade which was of greater benefit to Britain's trading accounts than a small devaluation would have been. Indeed it is suggested that against some currencies a lower exchange rate would not have been possible since "a lower level for the pound would have meant an even lower level for the French and Belgian francs" (1957, p. 93) This also applies to other currencies principally of empire countries whose currencies were tied to sterling rather than to gold and hence for a substantial share of trade no advantage would be gained. But Presnell (1975) has shown that some empire countries were considering breaking with sterling in 1925 if the pound had not returned to gold and that part of the increasing strain in the late 1920s was due to the weakness in the balance of payments of empire countries. For sterling countries , as a whole, devaluation against the dollar would have eased the strain considerably. Under such circumstances, it seems likely that the relative price effects of devaluation would have been augmented, through the effects on the primary producers of the empire, by positive income effects on British exports. In the aggregate import and export equations estimated by Thomas as part of his model the elasticities are -0.42 for imports and 0.53 for exports (with a one year lag). (1981, p. 344.) However, there are strong reasons for thinking that this is too pessimistic because the relative price term used in both equations is the value of the import deflator to the GDP deflator. While this may

be appropriate for the import equation, it is not a satisfactory index of export competitiveness. In order to explore this further, some estimates of export functions were made.

An export function for the U.K. 1924-38

To estimate an export demand equation in elasticity form, a logarithmic model was used, taking the following form

$$\ln X_t = \eta_o + \eta_1 \ln WT + \eta_2 \ln \frac{P_X}{P_W} t + u_{6t} \qquad (5.21)$$

where X is a volume index of exports, WT a volume index of world trade and P_X and P_W are price indices for exports and world trade respectively. Thus η_1 is the world trade and η_2 the relative price elasticity of demand for exports.

An important test of the model is that exports and domestic and foreign prices are individually significant. Thus the alternative form is

$$\ln X_t - \eta_o' + \eta_1' \ln WT + \eta_2' \ln P_{X_t} + \eta_3' \ln P_{W_t} + u_{6t}' \qquad (5.22)$$

Since the policy alternatives being considered involve changing export prices holding world prices constant, it is important that η_2' takes a negative and significant sign. Furthermore the failure of the two price terms to be individually significant would suggest that export prices were indeed tied to world prices either due to parallel movements in exchange rates or in competing world prices.

For the volume of world trade and of British exports, the indices provided by the League of Nations for 1924 to 1938 are used. From the same source price indices of world trade are available either measured

in gold or in sterling. As an alternative, Feinstein's index of exports of goods and services and his sterling price deflator were used[1]. The results are given in Table 5.4.

These equations all indicate a high degree of explanatory power and the Durbin Watson statistics almost inevitably fall into the indecisive region. In each case, the coefficients are individually significant and the coefficients on world trade at around 0.6 are consistent with other estimates[2]. When prices are measured in gold, the relative price elasticity is more than 2 and when entered individually, the price terms take almost exactly equal values with opposite signs. When sterling prices are used, the point estimates are slightly lower but the restriction still cannot be rejected on the F test at the 5% level.

There is a further drop in the coefficients when Feinstein's data is used and the separate price terms give even lower estimates though, as before the restriction cannot be rejected[3]. It seems likely that this fall in the coefficients results from the inclusion of invisibles in Feinstein's data which are likely to have been less price elastic and forwhich the prices are, in any case, not adequately represented in the price indices[4]. Thus the results overall strongly support the

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[1] The League of Nations' data is taken from Review of World Trade 1938, p. 60 and 78 and Feinstein's export volume and price series were taken from Feinstein (1972) Table 5, p. T16 and Table 64, p. T139.

[2] In his study of long term changes in world trade, Maizels (1963, p.214) found that over the period 1899 to 1955 the elasticity of British exports with respect to world trade was 0.5.

[3] The computed values of F for the three restrictions were respectively 0, 1.68 and 1.64 compared with a critical value at the 5% level of 3.29.

[4] Feinstein's procedure in arriving at a volume index of exports of services was to apply the merchadise import deflator, except in the case of shipping where an index of freight rates was used (1972, p. 122).

Table 5.4

Demand Equations for British Exports 1924-38

Prices in	Constant	$\ln WT_t$	$\ln(P_x/P_w)_t$	$\ln P_{x't}$	$\ln P_{w't}$	$\bar{R}^2$	RSS	DW
				League of Nations data				
Gold	1.8031 (0.5841)	0.6094 (0.1306)	-2.1867 (0.2132)			0.9234	0.0232	1.5526
Gold	1.8067 (0.6267)	0.6099 (0.1375)		-2.1936 (0.3495)	2.1924 (0.3130)	0.9165	0.0232	1.5601
Sterling	1.8358 (0.6158)	0.6026 (0.1377)	-2.1644 (0.2234)			0.9153	0.0256	1.5716
Sterling	1.0107 (0.8674)	0.6029 (0.1337)		-1.6090 (0.4753)	1.7888 (0.3590)	0.9201	0.0222	1.4186
				Feinstein's data				
Sterling	5.0059 (0.6116)	0.5638 (0.1304)	-1.4763 (0.1753)			0.8890	0.0239	1.6462
Sterling	3.8715 (1.0763)	0.5419 (0.1285)		-0.9289 (0.4648)	1.1375 (0.3175)	0.8943	0.0208	1.6308

view that the export price elasticity is larger than one and certainly larger than that obtained by Thomas and furthermore, that this reflects the equal and opposite effects of domestic and foreign prices.

Exchange Rate Policy and Employment

In his well known "back of an envelope" calculations, Moggridge estimated the deterioration in the balance of payments which resulted from the 11% revaluation of sterling in 1924-5 and which might have been expected from a 10% devaluation in 1928 - a typical gold standard year. The key assumptions made were that relative price elasticities for imports and exports were -0.5 and -1.5 respectively. Though the assumption of infinite elasticities of supply has been questioned, with general excess supply prevailing in the domestic economy and import prices ruled largely by world markets, these assumptions do not seem unreasonable. Furthermore, when the assumptions were changed to incorporate upward sloping supply curves, almost identical results were obtained for changes on the balance of payments. (Wright, 1981, Appendix, pp. 304-5).

Moggridge found that the 11% revaluation and 10% devaluation implied a deterioration of £80 million in 1924-5 and an improvement of £70 million in 1928 and, of this, £64 million and £52 million respectively arose from the change in the balance of visible trade. However, he did not evaluate the consequences of these changes for employment but only observed that the improvement in the balance of payments in 1928 would have easily contained an expansion of employment to reduce the unemployment rate below 5%. In the following Table Moggridge's calculations are taken somewhat further with the initial shift in the balance of payments evaluated for three different export elasticities but retaining the rest of Moggridge's assumptions.

Table 5.5

Year	(1) Export Price Elasticity	(2) Nominal Expenditure Switch £m	(3) Nominal Income Change £m	(4) Change in Government Budget £m	(5) Final Balance of Payments Change £m	(6) Implied Employment Change 000's
1924	-1	-53	-79.5	-31.8	-36.3	-207.5
"	-1.5	-80	-120.0	-48.0	-54.8	-313.2
"	-2.0	-107	-160.5	-64.2	-73.3	-418.9
1928	-1	48	72.0	28.8	32.9	196.9
"	-1.5	70	105.0	42.0	48.0	287.1
"	-2.0	93	139.5	55.8	67.7	381.5

Source: Estimates based on Moggridge 1972, Appendix 1, pp. 245-250. The estimates of expenditure switching use Moggridges allowances for the change in invisibles throughout.

In Table 5.5 this change due to expenditure switching is translated into a change in income using a value for the multiplier of 1.5. Columns (4) and (5) show the change in the budget using a macro marginal budget rate of 0.4 and the ultimate change in the balance of payments obtained by applying the marginal propensity to import of 0.21 to the change in nominal income. Column (6) gives the implied change in employment using Thomas's employment function[1].

[1] Middleton's estimates of the macromarginal budget rate did not cover the 1920s but, given the sharp rise indicated from 1929 to 1931, it appears that a figure somewhat lower than 0.44 would be appropriate for the 1920s. The application of the multiplier and the import propensity in nominal terms will, in the first instance, give a smaller income change and, in the second, a larger import change (for a devaluation) than if the calculations were made in constant prices. In the case of the employment function, the nominal income change was converted to 1938 prices before applying the employment function.

The results indicate that, depending on the assumed elasticity of demand for exports, the effect of the 11% revaluation in 1924 was to reduce employment by between 200 and 400 thousand. Similar magnitudes are indicated for the rise in employment which might have been expected from a 10% devaluation in 1928. The level of unemployment rose from 1.4 million to 1.56 million from 1924 to 1925 and in 1928 it stood at 1.54 million according to Feinstein's estimates. Thus it is clear that holding the pound in the neighbourhood of $4.40 in the 1920s would, not, of itself, have produced a high level of employment and it seems that total unemployment would not have fallen below one million though insured unemployment might have[1]. However, on unchanged fiscal policies it appears that there would have been a considerable improvement in the budget. Feinstein's estimates indicate that the current account of central government including the insurance funds worsened sharply from a deficit of £14 million in 1924 to £54 million in 1925. On the middle estimate of the export elasticity, it appears that a failure to revalue in 1924 would have eased most of this pressure on the budget but would not have left much scope for expansionary policies unless a budget deficit were entertained. In 1928, however, the actual deficit was down to £4 million. Had the authorities chosen to expand public spending to achieve a balanced budget, then, with an export elasticity of 1.5 and a 10% devaluation, income might have increased by as much as £300 million and employment by 840 thousand though this would probably have caused balance of payments difficulties[2].

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[1] The insurance totals for 1924 and 1928 are 1.17 and 1.28 million respectively.

[2] With a given expenditure switch ΔS and a macromarginal budget rate of 0.4, if the authorities expanded public works to maintain the same deficit as actually occurred, income would be raised by $\Delta Y = \frac{1.5}{1-1.5(0.4)}\Delta S$. This gives an income change of £308.8m and employment change of 844,000 but also a rise in imports of £64.8m which is almost equivalent to the initial improvement in the balance of payments due to expenditure switching.

It is clear from this that while a lower exchange rate would have provided some scope for the expansion of domestic demand, domestic demand expansion alone would have placed further strain on the balance of payments. In so far as short term capital movements were sensitive to the government's budgetary position, any attempt to pursue a quantitatively significant public works policy would probably have placed the gold standard in serious jeopardy. In his examination of Lloyd George's public spending proposals, Thomas (1975, p. 6) pointed out that any "adequate" public works programme would have driven sterling off the gold standard before 1931. However, once off the gold standard, the position would be different.

After leaving the gold standard, the pound fell sharply against other currencies but then began to rise. Redmond has calculated that taking 1929-30 = 100, the effective exchange rate for sterling fell to 86.7 in 1932 but then rose to 95.9 in 1934 and was back above its initial level in 1937 when it stood at 100.8 (1980, p. 90). After the dollar devaluation of 1933, the pound moved above par against the dollar where it remained until 1938. Thus any significant advantage to exporters which might have come from a lower exchange rate was relatively short-lived. In part this may have been due to the effects of import duties which were imposed in 1932 and which probably kept the exchange rate higher than otherwise. On the other hand the policy of cheap money adopted in 1932 ensured that the exchange rate was not pushed up by capital inflows attracted by domestic interest rate differentials,such as those which had been maintained under the gold standard. Indeed according to Nevin, the policy of cheap money emerged largely as a side effect of the desire of the monetary authorities, once off the gold standard, to keep the pound as low as possible. (1953, p. 82). In mid 1932, the Exchange

Equalisation Account was established with the same objective but as Howson has shown, while in 1933 the authorities were attempting to keep sterling below $3.50, by 1936, they were being forced to consider rates in excess of $5 because of a strong trend of improvement in the balance of payments (1980, pp. 55-56).

Thus the evidence indicates that, from 1932, lower exchange rates were not only feasible but desired as an object of policy. And yet it was an object which the authorities clearly failed to achieve despite the fact that there was an increase in reserves of £620 million between 1932 and 1937. Though this occurred largely due to capital inflow despite low interest rates, so that the current account balances of payments was worse in the 1930s than the 1920s (Wright, 1981, p. 289), it is likely that any further tendency towards deterioration of the trade balance would have brought lower exchange rates. This could have been induced directly by a higher level of domestic demand which would have raised the volume of imports. Hence lower exchange rates would have been the natural corollary of a higher level of domestic demand.

In order to evaluate the feasibility of such a policy, we can calculate how much the exchange rate would have to be lowered in order to accommodate a given domestic demand expansion. This depends on the assumption made about the balance of payments. A reasonable assumption which makes for computational ease is that the response of the authorities would be such that the balance of payments deficit in any year as a proportion of the import bill denominated in foreign currency is held at the existing level. Hence in proportionate terms the balance of payments is not allowed to be any worse than it actually was. The relationship between the proportionate addition to income arising from

demand expansion and the proportionate devaluation need to ensure that this condition is maintained is derived in Appendix 5.2 and is given by the following expression

$$\frac{\Delta e}{e} = \frac{m}{(z_1(1+n_1) + z_2(1+n_2)-1} \frac{\Delta Y}{Y}$$

where e is the exchange rate given in terms of the foreign currency price of sterling and Y is real GNP. m is the income elasticity of demand for imports which can be derived from Thomas's function to be almost exactly 1[1]. n_1 (which is negative) is the price elasticity of imports for which Thomas's figure of 0.42 is taken and n_2 is the export price elasticity for which three alternative values of -1, -1.5 and -2.0 are used. z_1 is (minus) the exchange rate elasticity of sterling import prices. Here we follow Moggridge's assumption applied for 1928 that a 10% devaluation would raise sterling import prices by 9% to allow for some narrowing of profit margins so that the value of z_1 is 0.9 (1972, p. 249). Similarly z_2 is the exchange rate elasticity of export prices in foreign currency which, allowing for some rise in exporters profit margins and some increase in costs arising from the change in import prices, is, following Moggridge, 0.6.

The three values obtained using export price elasticities of -1, -1.5 and -2 are -2.09, -1.29 and -0.93. Thus following this policy, for every percentage increase in domestic real income above that observed, the exchange rate would have to decline between one and two per cent to ensure no proportionate worsening in the balance of payments. Given the conditions of the 1930's these appear to be perfectly feasible

[1] From Feinstein (1972) Table 19, p. 149, the average import ratio for 1921-38 was .206 per cent which, divided into Thomas's marginal propensity to import, gives 1.01.

magnitudes but there is also another important aspect. It is that the impact of such a policy would be to expand exports and, hence, direct additional demand into the areas where it was most needed. By plugging the formula back into the export function we can calculate the income elasticity of exports. For the three different export elasticities, the results respectively are 1.26, 1.16 and 1.15 and hence it seems that this policy would have expanded exports more than proportionately with income.

The effects so far calculated are only the first round effects, however, and the impact of the increase in exports would be to raise income still further and push the exchange rate even lower. Thus the automatic operation of the policy would increase the value of the multiplier and, in order to measure this, we need to calculate the marginal propensity to export. Taking the export to income ratio as 0.16[1] (the value in 1932-3) this is calculated from the export elasticities for the three price elasticities as 0.20, 0.19 and 0.19 respectively. Taking this value as 0.2 we can see how incorporating this into the expression for the multiplier would augment the values considered earlier. Taking the values for the simple multiplier to be 1, 1.25 and 1.5, incorporating this effect raises them to 1.25, 1.67 and 2.14 respectively. Hence had a policy of devaluation been undertaken as the natural corollary of domestic demand expansion in the 1930's the multiplier would be enhanced to the extent that 1.25 would be an absolute minimum and the value may well have been as large as 2.0 or more. It goes without saying that this would also have the virtue of reducing the loan financed budget deficit which would be implied for a given programme of public spending.

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[1] Feinstein (1972) Table 19, p. 149.

Appendix 5.1

A Note on Benjamin and Kochin's Counterfactual Calculations for Benefit Induced Unemployment 1920 - 1938

In an attempt to indicate the possible quantitative significance of benefits on unemployment, Benjamin and Kochin calculated counterfactual series for unemployment on the assumption that the benefit to wage ratio was kept at the "no effect" level of 0.27. It was upon this calculation that their statements about the extent of benefit induced unemployment were based. This was not simply done by using the single equation model to predict unemployment with B/W at 0.27 since they argued that the estimated coefficient on this term would be downward biased as an estimate of its total effect on unemployment. They argued that holding the level of aggregate demand constant, to the extent that increases in the B/W ratio reduced employment as opposed to increasing the total number insured, it would reduce output and hence some of the output changes should be imputed to changes in the B/W ratio.

This is demonstrated in the following model:

$$U = U^* + a(B/W - 0.27) + bX + \varepsilon_1 \qquad (5A1.1)$$

$$\ln Q = \ln Q^* + d(U - U^*) + cX + \varepsilon_2 \qquad (5A1.2)$$

where U, B/W, Q and Q* are as defined earlier. U* is the natural rate of unemployment and X is an index of the unanticipated component of aggregate demand. Although X is unobserved (5A1.2) can be substituted into (5A1.1) to give an equation structurally identical to that of their estimating equation given as (5.1)

$$U = U^* + \frac{a}{1+\frac{b}{c}d}(B/W - 0.27) - \frac{b/c}{1+\frac{b}{c}d}(\ln Q - \ln Q^*)$$

$$- \frac{b/c}{1+\frac{b}{c}d}\varepsilon_2 + \frac{1}{1+\frac{b}{c}d}\varepsilon_2 \qquad (5A1.3)$$

b is expected to be negative and c positive. The term d is the effect of a change in unemployment, part of which is a change in employment, on output holding demand constant and is therefore expected to be negative. If there is no such supply side effect on output, then d = 0 and the model collapses back into the single equation from which unbiased estimates of a can be obtained.

Although d cannot be estimated directly, if plausible values can be imputed to it, estimates of the "true" value of a can be and, hence, the impact of changes in B/W measured. Benjamin and Kochin suggest upper and lower bounds for d which give lower and upper bounds for a. The upper bound for d is given as

$$d_u = \frac{W_{un}}{W}(\alpha)\left(\frac{-0.01}{1-0.01U}\right) \qquad (5A1.4)$$

The third term in the expression translates changes in the percentage unemployed into changes in employment and α is the proportionate change in output for a given change in insured employment set at ½. $\frac{W_{un}}{W}$ is the marginal product of unemployed relative to employed workers which is given a value of ⅔. For the lower bound, the expression is multiplied by ½ on the assumption that only half the change in unemployment arises from a change in employment and the remainder from a change in the participation rate. Also the ratio of marginal products is reduced to take the value of the benefit to wage ratio which gives

$$d = (\tfrac{1}{2})(B/W)(\alpha)\left(\frac{-0.01}{1-0.01U}\right) \qquad (5A1.5)$$

Using these measures Benjamin and Kochin first solve out for the true value of a and then calculate the counterfactual percentage unemployed[1].

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[1] For footnote 1, see next page.

These estimates are reproduced as Columns (2) and (3) in Table 5A.1. Over the period 1922 to 1938, their estimates indicate that insured unemployment would have averaged between 6.3% and 9.2% compared with the observed average of 14.1%. In Column (4) an alternative calculation is made which sets d = 0 so that the output effects are ignored. This shows by how much using these assumptions raises the estimate of benefit induced unemployment and the average counterfactual level is now raised to 9.7%.

A different interpretation would suggest that the estimated coefficient on B/W is likely to be biased up rather than down. This is derived from the Keynesian effects on aggregate demand of the payment of benefits. A rise in the rate of benefit, while it may have encouraged workers to register at the employment exchanges, will also, as a transfer payment, have increased the level of aggregate demand and output. The implications of this can be examined by utilising the same two equation model but changing its interpretation.

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[1] Footnote 1 from previous page:

The true value of α is obtained once a value for d is assumed by solving the equations (derived from the estimated coefficients)

$$\frac{a}{1+\frac{b}{c}d} = 18.3 , \qquad \frac{b/c}{1+\frac{b}{c}d} = -90.0$$

which, eliminating b/c, gives

$$a = 18.3 + 18.3 \left(\frac{-90d}{1+90d}\right)$$

counterfactual unemployment is simply actual minus benefit induced

$$U - a(B/W - 0.27)$$

Table 5A1.1

Counterfactual Insured Unemployment Percentages 1922 - 1938

	(1)	(2)	(3)	(4)	(5)
	Actual % Unemployed	Benjamin and Kochin Upper	Lower	d = 0	Keynesian effect
1922	14.3	12.2	10.8	12.5	12.8
1923	11.7	9.1	7.5	9.3	9.8
1924	10.3	6.7	4.5	7.6	8.1
1925	11.3	7.0	4.4	7.5	8.4
1926	12.5	8.0	5.4	8.6	9.6
1927	9.7	5.3	2.9	5.9	6.8
1928	10.8	6.1	3.4	6.6	7.6
1929	10.4	5.5	2.8	6.2	7.2
1930	16.1	10.6	7.1	10.8	12.6
1931	21.3	15.5	11.5	15.9	17.8
1932	22.1	17.1	13.4	17.8	19.0
1933	19.9	14.8	11.4	15.6	16.7
1934	16.7	11.2	7.8	11.6	13.5
1935	15.5	9.5	5.9	9.7	11.8
1936	13.1	6.6	3.0	7.0	9.1
1937	10.8	4.6	1.3	4.9	6.4
1938	12.9	6.8	3.3	7.0	9.0
Average	14.1	9.2	6.3	9.7	11.0

Source: Columns (1), (2), (3) from Benjamin and Kochin (1979a) p. 467. For the derivation of these figures and those in Columns (4) and (5), see text.

If X is now defined as the level of aggregate demand in the absence of insurance transfers, b is still expected to be negative and c positive as before but now d is the addition to demand arising from a rise in unemployment due to benefit payments. Since the same problem of unobserved X exists, it is again necessary to find a value for d and in this case it is estimated as

$$d = Mk \left(\frac{B}{W}\right) \left(\frac{0.01}{1-0.01U}\right) \qquad 5A1.6$$

The last two terms are as before; they convert a change in unemployment into a change in output. The first round addition to demand is less than the implied change in output and is reduced by the ratio B/W. Finally the first round effect is multiplied by the Multiplier, M times the marginal propensity to spend unemployment benefits, k [1].

It will be seen that d is now positive and applying this expression in the two equation system gives the counterfactual unemployment percentages in Column (5) which give an average of 11.0% considerably higher than those obtained by Benjamin and Kochin. These calculations cast a different light on their conclusion that "while members of the army of the unemployed were chiefly conscripts in the two major depressions of the era, they seem to have been willing volunteers during the late twenties and late thirties" (1979 , p. 468). The results indicate that, on this alternative view, their conclusion cannot be sustained even on the basis of their own estimated equation. If the output effects imputed by them are ignored, there is no year in which the benefit induced unemployed make up the majority. Furthermore, if Keynesian effects are taken into account, this conclusion is reinforced.

Even so, these results indicate more than 20% of unemployment was induced but, in any case, the absolute level of all these estimates depend on the arbitrary assumption of "no effect" below a B/W of 0.27.

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[1] There are likely to be biases running in both directions but it was not thought worthwhile to estimate upper and lower bounds. The B/W ratio is that of Benjamin and Kochin which is an over estimate for reasons previously examined but, on the other hand, the average wage used in the denomination is probably an over estimate of the productivity of marginal workers The multiplier value used is 1.5 and the m.p.c. out of benefits is 0.85, both of which, especially the latter, may be underestimates.

By varying this level according to taste, any proportion of benefit induced employment can be obtained as desired. The more important point, however, is that this adjustment was made by Benjamin and Kochin because they did not expect that the benefit to wage ratio would shift employment holding output constant. Had they recognised that this was in large part what they were picking up, there would have been no grounds for making such an assumption and they would have had to set d = 0.

APPENDIX 5.2

Economic Activity, the Trade Balance and the Marshall-Lerner Condition

The trade balance is defined in terms of foreign currency as:

$$B = P_x X - eP_m M \tag{1}$$

Where X and M are volume indices of exports and imports respectively, P_x is the foreign currency price of exports, P_m is the sterling price of imports and e is the exchange rate given as the foreign currency price of sterling.

Writing the trade balance as a proportion of the import bill:

$$b = \frac{B}{eP_m M} = \frac{P_x X}{eP_m M} - 1 \tag{2}$$

To hold the proportionate trade balance constant:

$$db = \frac{X}{eP_m M} dP_x + \frac{P_x X}{eP_m M} dX - \frac{P_x X}{e^2 P_m M} de - \frac{P_x X}{eP_m^2 M} dP_m - \frac{P_x X}{eP_m M^2} dM = 0.$$

dividing both sides by $\frac{P_x X}{eP_m M}$ gives (3)

$$\frac{dP_x}{P_x} + \frac{dX}{X} - \frac{de}{e} - \frac{dP_m}{P_m} - \frac{dM}{M} = 0 \tag{4}$$

Defining z_1 as the exchange rate elasticity of the foreign currency price of exports and $-z_2$ as the exchange rate elasticity of the sterling price of imports, the expression can be rewritten and rearranged to give:

$$\frac{dM}{M} = \frac{dX}{X} + (z_1 + z_2 - 1) \frac{de}{e} \tag{5}$$

The import function in proportionate changes is

$$\frac{dM}{M} = m \frac{dY}{Y} + n_1 \frac{dP_m}{P_m} \tag{6}$$

where Y is real GNP, m is the income elasticity and n_1 the price elasticity of imports. Domestic prices are assumed constant.

The export function in proportionate changes is

$$\frac{dX}{x} + -n_2 \frac{dP_x}{P_x} \tag{7}$$

Where n_2 is the export price elasticity and world prices are unchanged.

Substituting the exchange rate into (6) and (7) gives:

$$\frac{dM}{M} = m \frac{dY}{Y} - n_1 z_1 \frac{de}{e} \tag{8}$$

$$\frac{dX}{X} = n_2 z_2 \frac{de}{e} \tag{9}$$

Substituting (8) and (9) into (5) gives:

$$m\frac{dY}{Y} = (n_1 z_1 + n_2 z_2 + z_1 + z_2 - 1) \frac{de}{e} \tag{10}$$

and on rearranging we obtain an expression analogous to the discrete function used in the text.

$$\frac{de}{e} = \frac{m}{(z_1(1+n_1) + z_2(1+n_2) - 1)} \frac{dY}{Y} \tag{11}$$

CHAPTER 6

EMPLOYMENT, UNEMPLOYMENT AND BENEFITS: SOME FURTHER TESTS

6.1 Employment Functions and the Interwar Period

In the first part of this chapter we turn to examining variants of a simple annual model of employment for the industrial sector and for the individual industries comprising it. There are two distinct motives for doing this, the details of which are dealt with in sequence. The first is to compare the results of these functions on interwar data with those of similar functions for the postwar period. In this, the aim is to examine and interpret any systematic differences which emerge in the two periods in the context of the general differences between the periods, in particular in the conditions of excess supply. The second is to get behind the results obtained for aggregate employment obtained in the previous chapter. In particular, it is important both for the evaluation of economic policy and for the debate over unemployment benefits to see if the aggregate results for output, the real wage and the benefit to wage ratio are substantiated at the disaggregated level. Furthermore systematic differences which emerge at this level may raise doubts about the validity of the aggregate equations or alternatively indicate what the impacts of various policy measures might have been at the industrial level.

Estimating Employment Functions

Since the mid-1960s, numerous studies of the determinants of employment have appeared[1]. These models typically relate employment to a string of variables derived from hypotheses about the determinants of short run demand for labour and are interpreted as labour demand equations. Most of the econometric effort has concentrated on postwar

[1] For a recent survey of this literature, see Hazeldine (1981).

data and supply constraints are generally ignored even though labour markets may have been in excess demand for part of the period. Indeed it is ironic that the earliest papers in the field by Brechling (1965) and Ball and St. Cyr (1966) estimated demand functions for labour over the period up to the early sixties when the labour market appears to have been tighter than over any other period for which data are available. The interwar period on the other hand, provides a unique opportunity to observe employment under conditions of labour market excess supply. Despite the fact that equations for this period are likely to be more convincing as estimates of true demand functions, such estimates have not previously been made. Thus it will be of interest to compare the results with those obtained for other periods and to do this, some of their features will be briefly outlined.

The characteristic findings can best be examined by reconsidering the basic model put forward by Ball and St. Cyr (1966) which was used earlier. Essentially, the production function is simply inverted to give an equation for desired employment in terms of output and a time trend.

$$E^* = \alpha_o^{\frac{1}{\alpha_1}} H^* Q^{\frac{1}{\alpha_1}} e^{\frac{\alpha_2}{\alpha_1} t} \tag{6.1}$$

This is the same equation as (5.2) and represents the output constrained cost minimising employment level. In addition there is the partial adjustment mechanism relating desired to actual employment

$$E_t/E_{t-1} = (E_t^*/E_{t-1})^{\lambda} \tag{6.2}$$

On substituting (6.1) into (6.2) and estimating either at the industry or aggregate level, some strikingly consistent results appear. These are that the estimate of α_1 almost always turns out to be larger than one, implying increasing short run returns to labour and that the estimate of λ is substantially lower than one, indicating relatively slow adjustment speeds. In a recent study, Wilson (1979) estimated different variants of this function on annual data for 1948-70. The use of annual observations is important for the comparison with the interwar period for which only annual data is available. Out of 34 industries output was significant in 25, lagged employment in 27 and the time trend in 20. In 15 industries, the returns to labour parameter exceeded unity which is a rather smaller proportion in most quarterly models. Even more striking was the finding that the point estimate for the adjustment parameter λ was found to be less than 0.5 in 31 cases, implying average lags, calculated as $\frac{1-\lambda}{\lambda}$, in excess of one year (1979, p. 10-12)[1].

Efforts to explain and improve on the standard results have taken a number of directions. One suggestion is that the measured returns to labour embody the returns to other factors and should therefore be interpreted as returns to scale (Ireland and Smythe, 1970). In order to overcome this simultaneous models of factor demand and utilisation rates with interrelated factor adjustment have been specified (Nadiri and Rosen, 1969). On U.K. data, the results do not appear to improve very substantially on the simple single equation model (Briscoe and Peel, 1974, 1975, Hart and Sharot, 1978). Alternatively, non-linear

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[1] Wilson reported slightly better results more in accord with a priori expectation from a model based on Hazeldine (1978).

production functions and asymmetric adjustment lags have been used (Hazeldine, 1978). It is sometimes thought that the length of lags partly reflects supply constraints as well as internal adjustment costs[1]. When postwar data is partitioned into supply and demand side observations the employment function under excess supply exhibits both faster adjustment and lower short run returns to labour. (Peel and Walker, 1978, p.199). Similarly the structural breaks occurring in the standard employment function in the mid 1960s may be associated with rising levels of unemployment but though the evidence up to 1972 indicated a decline in the return to labour parameter, there was also a decline in adjustment speed - though this result largely disappears when the data is extended further into the 1970s (Briscoe and Roberts, 1977; Morgan, 1979).

Another line of enquiry suggests that part of the observed labour force is determined by the scale of the firm's capacity rather than the actual level of output. Morgan (1978, p. 9) found that, for non manual workers, output elasticities were very low and adjustment speeds insignificantly different from zero and, more recently, Nickell (1981) has used this distinction to derive an aggregate model with a complex lag structure[2]. In the framework developed by Oi (1962) each unit of labour may be

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1 Ball and St. Cyr (1966,p. 192), Hughes (1971, p. 375), Hazeldine (1981 , pp. 159-163).

2 The implication of overhead or fixed labour is demonstrated simply by Nickell (1981, p. 36). If E_F is fixed labour and the production function is

$$Q = (E - E_F)^{\alpha_1}$$

then the estimated value of short run returns would be

$$\hat{\alpha}_1 = \frac{\alpha_1}{1-(E_F/E)}$$

thus $\hat{\alpha}$ is an upward biased estimate of α_1.

partially fixed because of the firm specific human capital invested in the worker. In long run equilibrium, the wage is below the marginal product of employees and the difference is the return on the firm's investment in training. When demand contracts, they will not be laid off until the marginal product falls to the variable cost, i.e. the wage. A third hypothesis due to Miller (1971) is that hoarded labour can be regarded as a substitute for inventories to meet unexpected variations in demand given the costs of inventory holding and the adjustment costs associated with changing the employment level. Tests of these hypotheses have produced rather mixed results (McKendrick, 1975; Greer and Rhoades, 1977). In any case it seems that the arguments should apply with more force to the speed of adjustment than to returns to labour except in the case of fixed workers which are more analogous to the capital stock. However, the effects might be different at different levels of labour market tightness. Firms might be more willing to lay workers off if they could get them back at a moment's notice.

These hypotheses have been developed largely because increasing short run returns is inconsistent with the usual downward sloping demand curve needed for competitive equilibrium . Thus taking the first order condition for profit maximisation implied by (6.1) gives an equation for desired employment similar to (5.16) as

$$E^* = (\alpha_1\alpha_o)^{\frac{1}{1-\alpha_1}} \; H^{*-1} \; \frac{W}{P}_t^{-\frac{1}{1-\alpha_1}} \; e^{\frac{\alpha_2}{1-\alpha_1}t} \qquad (6.3)$$

Similarly the implied first order condition for desired output reflected in (5.13) is

$$Q^* = \alpha_o^{\frac{1}{1-\alpha_1}} \alpha_1^{\frac{\alpha_1}{1-\alpha_1}} \left(\frac{W}{P}\right)_t^{\frac{-\alpha_1}{1-\alpha_1}} e^{\frac{\alpha_1}{1-\alpha_1}t} \qquad (6.4)$$

If $\alpha_1 > 1$, there is no finite maximum and it is clear from (6.3) and (6.4) that downward sloping functions for output and employment in the real wage, cannot be obtained. However, inferences from about (6.3) and (6.4) have generally been derived from estimates of (6.2). If the effect of quasi-fixity or labour hoarding or contractual employment is to cause the true variable part of employment to be mis-measured, then (6.3) might still be found downward sloping even though it will not give an adequate estimate of α_1. An alternative would be to exclude employment altogether and estimate the parameter from an output equation such as (6.4).

If the labour market is in disequilibrium, the observed relationship between the real wage and employment or output will depend on the prevailing regime. This is shown in Figure 6.1 which is a simplified version of

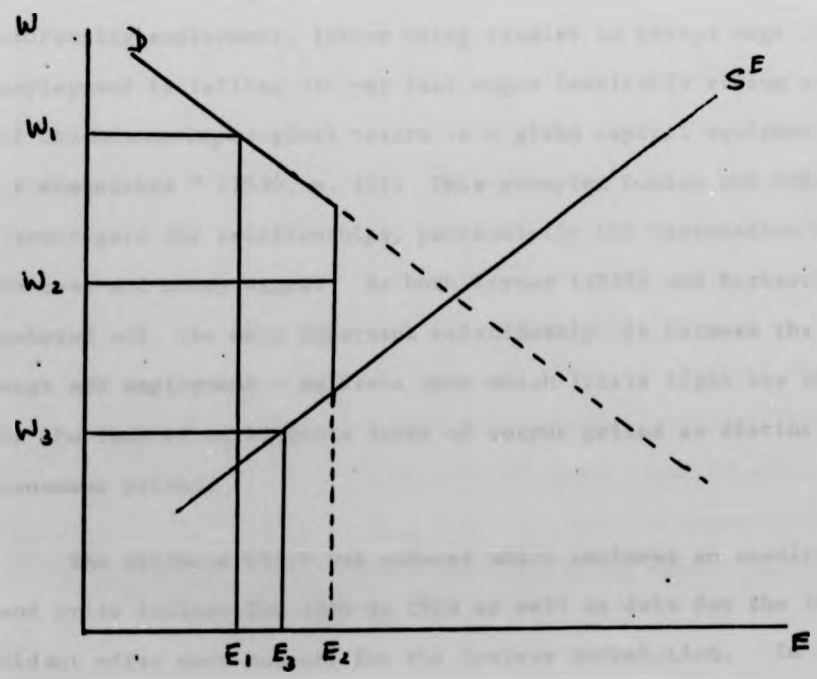

Figure 6.1

Figure 5.2. In the neighbourhood of W_1 and E_1 the economy or industry is in Classical unemployment with employment and output set at their unconstrained profit maximising levels. Variations in the wage will cause inverse variations in employment. Under Keynesian unemployment with the wage in the region of W_2, variations will not lead to changes in employment unless such changes cause changes in the rationed level of output which gives rise to employment at E_2. In the third case where there is excess labour demand in the region of W_3, there will be a positive correlation between the wage and employment if the labour supply curve is upward sloping.

This issue was first raised as an empirical question in the famous debate which took place in the late 1930s between Keynes (1939), Dunlop (1938) and Tarshis (1939). It arose from a passage in the General Theory in which Keynes asserted that "in the short period, falling money wages and rising real wages are each, for independent reason, likely to accompany decreasing employment, labour being readier to accept wage cuts when employment is falling off yet real wages inevitably rising on account of the increasing marginal return to a given capital equipment when output is diminished " (1936, p. 10). This prompted Dunlop and others to investigate the relationships, particularly the correlation between changes in real and money wages. As both Keynes (1939) and Richardson (1939) pointed out, the more important relationship is between the product wage and employment - an issue upon which little light was shed because of the lack of an adequate index of output prices as distinct from consumer prices.

The evidence which was adduced which included an examination of wage and price indices for 1860 to 1913 as well as data for the interwar period, did not offer much support for the inverse correlation. In a later

study using aggregate data for the U.S. and Canadian economies for the interwar and postwar periods, Bodkin reexamined the relationship between the detrended real wage and unemployment. The findings confirmed that no strong relationship could be found in either direction though, for interwar Canada and some other cases, the expected sign was obtained on the regression coefficient (1969, p. 361). Recently, more successful results have been obtained both for postwar Britain and the U.S. in which strong negative coefficients were obtained for employment on the real wage but with dynamic models giving long adjustment lags (Neftci, 1978, Sargent, 1978 and Symons 1981).

These studies do not estimate structural models of supply and demand. As was shown in Chapter 3, a negatively sloped labour demand curve could be estimated in an equilibrium model for the period before 1913, a result similar to that obtained by Lucas and Rapping on U.S. data from 1929. In most single equation models, where employment is assumed to be demand determined, relative price terms do not generally yield very significant coefficients. But when regimes of excess supply and excess demand for labour are separated, the results improve. Thus, in their disequilibrium model, Rosen and Quandt obtaimed highly significant negative coefficients on the real wage (1978, p. 376). Similarly, for post war Britain, Peel and Walker used a simple wage change rule to separate the two regimes and obtained a strong negative real wage coefficient in an employment function under excess demand (1978, p. 198). In each of their studies, however, the employment function was following Dhrymes (1969) based on the first order condition from a C.E.S. production function. As in Chapter 3, output appears as a regressor and it becomes difficult to distinguish between the output constrained employment function and the unconstrained case. However, if excess supply in the labour market can

be assumed, then one regime is ruled out and it becomes more feasible to attempt a distinction between the two labour demand regimes.

Of more immediate significance for the interwar economy is that, if the regime of Classical Unemployment were found to hold in important sectors of the economy, then straightforward demand expansion designed to relax the constraint of effective demand would not have been as the simple Keynesian model implies since the stimulus to output and employment would come through raising product prices. This was the point emphasised by Keynes (1939) in his response to Dunlop (1938) and Tarshis (1939). On the other hand, with money wages relatively fixed, given the high elasticity of demand for British exports, any policy induced decline in the exchange rate might have stimulated exports through raising sterling export prices whilst lowering them in terms of foreign currency. Thus distinguishing between those industries in which employment was responsive to the real wage and those in which it was not, would be important from the point of view of public policy.

In the aggregate employment equation of Table 5.1, there was both increasing short run returns and an insignificant real wage term which, on the face of it, casts doubt on the Classical regime. But this may be an artifact of aggregate data in which the service sector whose prices are not adequately measured is mixed up with the industrial sector. Though separate tests did not indicate that the inclusion of lagged employment was appropriate, it is of importance in discussing labour hoarding and the role of unemployment benefits to examine speeds of adjustment and returns to labour at the industry level.

The idea that the benefit to wage ratio has a major effect in shifting the level of employment is difficult to reconcile within the neoclassical approach. However, if employers systematically hoarded labour, higher unemployment benefits might have induced them to operate closer to their production functions. In the presence of unemployment benefits the costs of laying off workers in rotation might not be very great especially under conditions where the opportunities for employment elsewhere faced by such workers were severely limited. This would suggest that employment would respond increasingly rapidly to demand changes and that, as the benefit to wage ratio rose, a progressive "shake-out" took place. Such hypotheses have been investigated for the 1960s where there appears to have been a substitution of hours for employment[1]. Even so, it is difficult to imagine that, even if the impact of benefits was to reduce short time working, or at least change it from being measured as employment to unemployment, as well as to cause substitution of hours for employment, that this would have caused measured unemployment to have

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[1] Shifts in unemployment for a given output in the mid 1960s were associated with a rise in unemployment benefits by Maki and Spindler (1975) using an approach closely followed by Benjamin and Kochin (1979). Knight and Wilson (1977) found that there had been a shake out or decline in labour hoarding at this time for reasons unassociated with benefits. In their study, Holden and Peel (1976) found that there appeared to have been a substitution of employment for hours which was reflected in a break in the hours equation, indicating increased responsiveness to output after 1966.

risen by one and a half million or more by the later 1930s.

Details of actual hours worked are incomplete and exist for only a few industries in the interwar period. In a study using data for the engineering industry, Harrison and Hart (1982) found some weak evidence that the interwar insurance system affected working hours. However, these came through as a result of the insurance contributions paid by employers rather than rates of benefit paid to the unemployed. Insofar as changes in contribution were paralleled by changes in benefits, this effect might be reflected in the coefficient on the benefit to wage ratio. However, rates of contribution were small relative to wage rates and, unless employment were highly wage rate elastic, it seems unlikely that this can account for very much of the observed effect .

Whatever the exact interpretation of the benefit to wage ratio in the employment function, it is important to determine whether this result holds at the industry level. In his sectoral estimates, Collins specified the unemployment rate of an industry as a function of the benefit to wage ratio and the deviations of employment from trend, thereby explicitly restricting the equations to focusing on supply side effects. Only in cotton textiles and the distributive trades were significant positive benefit effects found. In their reply, Benjamin and Kochin argued that output, rather than employment, should be used thus making it explicit that shifts in employment holding output constant, were expected. They estimated the relationship between output and unemployment for 7 industries, finding that only in electrical engineering was the coefficient not significant (1982, p.420-1). In the light of this, a wider

industry level examination of the effect of unemployment benefits as a shift term in the employment function will identify the sectors in which this phenomenon appears and may suggest some reasons for the empirical findings.

When examining employment at the industry level, some account needs to be taken of different trends between industries which might be due to faster technical progress, capital accumulation or structural change such as often discussed in the literature. It is possible that some of the structural shifts observed in unemployment rate equations around 1930 might be due to such effects (Ormerod and Worswick, 1980, Table 3, p. 110; Irish, 1980 , pp. 3-5) from 1924 to 1929, the capital stock in manufacturing grew at an annual average rate of 0.6%, falling to 0.4% from 1929 to 1937. But for individual industries the differences are much greater. In textiles, the rates were 0.1% and -1.6%, in shipbuilding 10.6% and -1.4% and in engineering -0.1% and 0.4% respectively (Dowie, 1968, Table 3, p. 76). Thus at least at the industry level some allowances should be made for different trend rates of growth in the capital stock between the two periods. Total factor productivity also grew faster in manufacturing in the 1930s than the 1920s and here also there are sharp breaks in the performance of industries between the two periods with ferrous metal, electrical engineering, textiles and leather all showing a marked rise of 2.5% or more in the 1930s compared with 1924-29.

6.2 Output Constrained Employment Functions 1921-1938

In this section output constrained employment functions based on (6.1) and (6.2) are considered. To obtain an estimating equation appropriate to the interwar period, the Ball and St. Cyr model is augmented with multiplicative shift terms for the benefit to wage ratio and a time trend dummy for the 1930s. Taking logs and adding a stochastic error term gives the estimating equation

$$\ln E_t = a_o + a_1 \ln Q_t + a_2 \ln E_{t-1} + a_3 t + a_4 Dt + a_5 \ln\frac{B}{W} + \varepsilon_{1t} \qquad (6.5)$$

where D is a dummy taking the value of one for 1930 to 1938 and zero otherwise. Of the coefficients $a_1 = \frac{\lambda}{\alpha_1}$, $a_2 = (1-\lambda)$, $a_3 = \frac{\lambda\alpha_2}{\alpha_1}$ and a_4 and a_5 are the direct shift coefficients multiplied by the adjustment coefficient λ.

The model was estimated for 19 industries and for industrial production and manufacturing as a whole on annual data 1921 - 1938. The employment series are for man-years of employment (full time equivalent) given by Chapman (1953, Table 61, p. 18) which are based on the 1948 Standard Industrial Classification. The wage series are those obtained by dividing Chapman's series for the total wage bill in these industries by the employment series. Both sets of data are for wage earners only so that in so far as salary earners reflect overhead labour, they are excluded. The output indices are those given by Lomax (1964, p.32-3) which are also based on the 1948 s.i.c. For benefits, different weighting systems would be appropriate to different industries but since sufficiently detailed information to calculate different sets of weights is not available, the national weighted index calculated earlier is used for all industries.

Table 6.1

Output Constrained Employment Functions for UK Industries 1921-1938

(1) SECTOR	(2) a_o	(3) a_1	(4) a_2	(5) a_3	(6) a_4	(7) a_5	(8) R^2	(9) DW h	(10) α
Industrial Production	3.6126	0.7888	0.0070	-0.0131	-0.0006	-0.3299	0.9635	2.7799	1.2588
	(0.3657)	(0.0536)	(0.0031)	(0.0037)	(0.0015)	(0.0584)		-1.6495	(0.0868)
Manufacturing Industries	4.0604	0.6980	0.0036	-0.0052	-0.0041	-0.2602	0.9849	2.8160	1.4275
	(0.2352)	(0.0347)	(0.0022)	(0.0024)	(0.0010)	(0.0382)		-1.7310	(0.0720)
Building Materials	1.1618	0.6944	0.0139	0.0136	-0.0079	-0.1508	0.6676	2.9396	1.4201
	(7.3266)	(0.5616)	(0.0922)	(0.0404)	(0.0161)	(1.0207)		-2.1657	(1.2509)
Chemicals	0.7501	0.4004	0.0131	0.0099	-0.0086	-0.4990	0.6424	1.2741	2.4648
	(0.8982)	(0.1408)	(0.0150)	(0.0089)	(0.0031)	(0.1626)		1.5431	(0.8850)
Ferrous Metals	1.8518	0.5507	0.0055	-0.0027	-0.0073	-0.2677	0.7596	2.3010	1.8059
	(1.2563)	(0.0968)	(0.0309)	(0.0130)	(0.0065)	(0.2276)		-0.6440	(0.2961)
Mechanical Engineering	-1.0257	0.9944	-0.0462	-0.0024	0.0001	-0.5602	0.8890	1.7469	1.0521
	(1.0964)	(0.1044)	(0.0159)	(0.0105)	(0.0061)	(0.1772)		0.5381	(0.1089)
Electrical Engineering	-0.5469	0.3637	0.0427	0.0243	0.0019	-0.7236	0.9740	1.5030	2.6321
	(0.8062)	(0.0901)	(0.0145)	(0.0094)	(0.0035)	(0.1177)		1.0563	(0.6939)
Ship-building	-1.7882	0.3614	0.0590	0.0009	-0.0122	0.9548	0.9457	1.6390	2.6038
	(1.8197)	(0.0314)	(0.0344)	(0.0144)	(0.0083)	(0.3294)		0.7741	(0.2442)
Vehicles	5.1066	0.4241	-0.0145	0.0058	-0.0035	0.2285	0.9841	1.5166	2.3916
	(0.4860)	(0.4682)	(0.0076)	(0.0058)	(0.0025)	(0.0809)		1.0260	(0.2636)
Precision Instruments	1.5144	0.6751	-0.0020	-0.0173	-0.0032	0.0176	0.9365	1.3492	1.4842
	(0.4256)	(0.0728)	(0.0057)	(0.0047)	(0.0019)	(0.0583)		1.3809	(0.1603)

(1) SECTOR	(2) $\bar{a}_o$	(3) a_1	(4) a_2	(5) a_3	(6) a_4	(7) a_5	(8) $\bar{R}^2$	(9) DW/h	(10) α
Metal goods n.e.s.	-1.9178	1.7969	-0.0401	-0.0636	0.0071	0.1145	0.5430	2.9655	0.5788
	(4.2348)	(0.5065)	(0.0611)	(0.0436)	(0.0177)	0.06981		-2.1206	(0.1484)
Textiles	3.9213	0.5338	0.0167	0.0047	-0.0156	-0.1265	0.8972	1.9990	1.8421
	(0.8891)	(0.1059)	(0.0123)	(0.0081)	(0.0033)	(0.1852)		0.0021	(0.3540)
Leather	-2.2037	0.6179	-0.0515	0.0159	0.0073	-0.7789	0.6621	1.0077	1.7017
	(1.7628)	(0.1977)	(0.0177)	(0.0080)	(0.0039)	(0.2266)		2.1109	(0.5354)
Clothing	3.2568	0.5075	0.0129	-0.0020	-0.0012	-0.1335	0.8788	0.6756	1.9446
	1.2094	(0.2314)	(0.0040)	(0.0065)	(0.0019)	(0.0682)		2.8100	(0.8845)
Food	1.9745	0.8918	-0.0077	-0.0145	-0.0041	0.0240	0.9149	1.3742	1.1230
	(1.1979)	(0.2968)	(0.0074)	(0.0129)	(0.0021)	(0.1042)		1.3281	(0.3721)
Drink	3.5064	0.3128	0.0063	0.0063	-0.0033	0.0923	0.9209	1.1864	3.1768
	(0.3958)	(0.0393)	(0.0051)	(0.0024)	(0.0012)	(0.0599)		1.8707	(0.4067)
Tobacco	1.5470	0.2483	0.0164	-0.0059	-0.0013	-0.2038	-0.1339	0.5408	3.4597
	(1.5194)	(0.2045)	(0.0127)	(0.0091)	(0.0035)	(0.1829)		3.0999	(2.5114)
Timber & Furniture	-1.2888	0.5441	-0.0086	0.0034	-0.0020	-0.5920	0.9169	1.8117	1.8537
	(1.0718)	(0.1181)	(0.0084)	(0.0080)	(0.0028)	(0.1362)		0.3997	(0.4037)
Paper & Printing	5.9191	0.0649	-0.0025	0.0154	-0.0030	0.1015	0.9790	1.5552	15.4468
	(0.6000)	(0.0937)	(0.0080)	(0.0012)	(0.0013)	(0.0664)		0.9441	(22.3135)

(1) SECTOR	(2) a_o	(3) a_1	(4) a_2	(5) a_3	(6) a_4	(7) a_5	(8) R^2	(9) DW/h	(10) α
Mining & Quarrying	0.9016	0.7113	0.2218	-0.0116	-0.0034	0.2617	0.9607	1.0497	1.0941
	(0.6522)	(0.0512)	(0.0688)	(0.0061)	(0.0034)	(0.0772)		2.0202	(0.1196)
Gas, Electricity & Water	4.5130	0.1320	-0.0049	0.0137	0.0009	0.0113	0.9928	0.8806	7.6129
	(0.4835)	(0.0808)	(0.0040)	(0.0056)	(0.0011)	(0.0565)		2.3750	(4.6636)

Standard Errors are given in brackets below the coefficient estimates and the points estimate implied for the parameter α is given in Col. (10) with its associated asymptotic standard error. The figure given below the Durbin Watson statistic in Col. (9) is Durbin's h statistic.

The results of estimating equation (6.5) are given in Table 6.1. With a few exceptions for individual industries, the overall explanatory power of these equations, judging by the values of $\bar{R}^2$, is quite high, particularly for the aggregates of the first two rows. Only in the case of tobacco does the equation completely fail to account for the variance of employment. Since lagged dependent variables are included, Durbin's h statistic is given below the Durbin-Watson statistic in Column 9. This suggests that serial correlation cannot be rejected at the 5% level in either of the aggregate equations and in seven of the industries and this is an important caveat in the interpretation of the results.

As might have been expected, a_1 is highly significant in the aggregate equations at the 5% level in all but four of the industry equations, the exceptions being building materials, vehicles, tobacco and paper and printing. The implied values of the parameter α_1 and its associated standard error are given in column 10 of the Table. Both for the aggregates and all but one of the industries, the value is greater than one, significantly so in the aggregates and all but one of the industry equations. These results are similar to and perhaps even more decisive than those typically obtained for the postwar period referred to earlier. If one takes the interpretation that variations in employment reflect variations in the utilisation of all factors, this might be interpreted as short run returns to scale but, even so, 8 of the industry equations give point estimates for α_1 which are larger than 2. In this light, it seems likely that the estimates reflect variations in the rate of utilisation of employed labour or perhaps a high proportion of fixed or overhead labour.

The coefficient on the lagged dependent variable is strikingly different. With the exception of mining and quarrying, it is always smaller than 0.1, implying that in annual terms, lags are negligible and indeed, the coefficient is often negative though in only three industries significantly so. Though these results are not strictly comparable with those which have been obtained on quarterly data, the results of Wilson (1979) discussed earlier indicate that this appears to be a major difference between the interwar and postwar periods. If, as was suggested earlier, adjustment lags are likely to reflect, at least in part, supply conditions in the labour market, then this can be interpreted as striking confirmation of the conditions of excess supply in the interwar period. On the other hand, if one takes excess supply as accepted a priori, then the estimates suggest that it is indeed through the adjustment coefficient that supply conditions are reflected.

The pattern of coefficients on the time trend dummy give very weak support for an upward shift in the secular growth rate of output per worker in the 1930s though the effect appears to be highly significant for the manufacturing sector as a whole. Among individual industries, however, both the trend and dummy variables give the wrong sign and, on average exhibit low levels of significance. The same cannot be said of the benefit to wage ratio which at least in the aggregate equations, appears to have exerted a powerful influence on the utilisation rate of employed labour. In manufacturing the coefficient is exceptionally well determined, giving a t value of nearly 7 and indicating that a 1% increase in the benefit to wage ratio reduces employment by 0.25%.

One of the reasons for investigating the effect of the benefit to wage ratio was to see if it was merely an artifact of aggregate data picking up compositional changes or non-linear trends. To some extent

this is borne out since, at the more disaggregated level, though 10 of the industries give negative coefficients on the benefit to wage ratio of which 6 are significant at the 5% level, 9 give positive signs of which 3 are significant. A further impression of this can be gained from the weighted average of coefficients obtained within manufacturing. Using the average employment weights for 1924, 1929 and 1937, the aggregate coefficient for the 12 industries in manufacturing is 0.1058 which is less than half the size of the point estimate for manufacturing as a whole[1]. Together with the wide variation in the size of the coefficients and their significance this casts considerable doubt on the impact of benefits as a systematic force affecting employment. In the 7 industrial unemployment equations estimated by Benjamin and Kochin, only in electrical engineering did they fail to find a significant positive coefficient on the benefit to wage ratio (1982). Of the six of these included among the employment functions in Table 6.1, only two gave significant negative coefficients and one of these was electrical engineering[2].

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[1] The weights were taken from the calculations of Dowie (1968,Table 4, p. 77) (based on Chapman's data) for the three years. Two manufacturing industries, other manufactures and non-ferrous metals are not included in the employment function estimates but these only accounted for 3.4% of manufacturing employment and the weights on the included industries were raised to compensate for their omission.

[2] Benjamin and Kochin, (1982) Table 2, pp. 420-1). The other six industries they used were coal mining, textiles, timber, shipbuilding, electrical, utilities and distributive trades. In the employment function estimates above, non-industrial sectors were excluded both because service employment is widely used as the basis of output estimates, giving a non independence between them and because price data is difficult to come by.

Some further expermentation was undertaken with the equations. Both the time trend dummy and the lagged dependent variables were removed from the equation but this affected the other coefficients very little. Secondly a measure of the realwage (discussed in the next section) was introduced in place of the benefit to wage ratio. If the latter were acting as a proxy for the real wage, then its sign would be positive. Thus if the real wage were affecting employment independently of output in some industries, this might account for the instability of the benefit to wage ratio across industries. In six cases, significant negative coefficients were obtained but four of these were in industries for which Table 6.1 gives negative coefficients on the benefit to wage ratio. The main effect of introducing the real wage into equations with output was to reduce the size and significance of the output coefficients in cases where the real wage coefficient was well determined. As has been observed, it is not clear that both of these should be included in the employment function and so, rather than examine these results in detail, we move to some estimation of pure classical employment demand and output supply functions.

6.3 Unconstrained Functions for Employment and Output

In this section we turn to examining a set of unconstrained functions for employment and output. In this case the underlying functions for desired output and employment are (6.3) and (6.4) which are simultaneously determined from the first order conditions. As before the employment function is derived by including the multiplicative shift terms, substituting into the adjustment mechanism and taking logs to give the estimating equation

$$\ln E_t = b_o + b_1 \ln(\frac{W}{P})_t + b_2 \ln E_{t-1} + b_3 t + b_4 Dt + b_5 (\frac{B}{W})_t + \varepsilon_{2t} \tag{6.6}$$

where $b_1 = \frac{-\lambda}{1-\alpha_1}$, $b_2 = (1-\lambda)$ and $b_3 = \frac{\lambda d_2}{1-\alpha_1}$ with b_4 and b_5 as the shift coefficients.

Before turning to the results, some reference must be made to the additional data on prices which is needed for estimation. These were gleaned from several sources and in some cases, pieced together as described in more detail in Appendix 6A1. These are rather crude and are likely to suffer from two types of error. First the series used may not adequately reflect the range of prices which would be included in the industry's average price but, more importantly, several of the series used are broad price indices which, again, may not adequately refect the price history of the individual industry. Secondly the appropriate price in theory is the price of value added but the prices used most nearly approximate the prices of final output.

The overal explanatory power of the equations given in Table 6.2 is lower than for those in Table 6.1 though, for manufacturing as a whole, it is still respectably high. On the criterion of Durbin's h

Table 6.2

Unconstrained Employment Functions for U.K. Industries 1921-1938

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
SECTOR	b_o	b_1	b_2	b_3	b_4	b_5	$\bar{R}^2$	DW/h	α
Industrial	7.1896	2.2244	0.0393	0.0031	-0.0100	-0.4295	0.4231	1.1293	1.2729
Production	(1.3380)	(1.4164)	(0.0174)	(0.0190)	(0.0051)	(0.2304)		1.9000	(0.2817)
Manufacturing	7.5686	-0.4911	0.0055	0.0308	-0.0064	-0.1847	0.8850	2.1076	-1.0250
Industry	(0.5800)	(0.0753)	(0.0061)	(0.0041)	(0.0026)	(0.1079)		0.2283	(1.4036)
Building	8.2026	0.3348	-0.0677	0.0526	-0.0211	0.6130	0.6346	2.9699	4.1981
Materials	(4.1884)	(0.6033)	(0.0644)	(0.0235)	(0.0122)	(0.7914)		-2.1391	(5.7695)
Chemicals	2.5504	-0.4523	0.0150	0.0325	-0.0076	-0.5153	0.6626	1.4877	-1.1778
	(0.8731)	(0.1484)	(0.0142)	(0.0057)	(0.0032)	(0.1557)		1.0887	(0.7016)
Ferrous	7.7920	-1.1375	-0.0324	0.0284	0.0172	0.2931	0.4626	2.3022	0.0924
Metals	(2.8751)	(0.4062)	(0.0588)	(0.0163)	(0.0091)	(0.4685)		-1.0438	(0.2894)
Mechanical	3.3553	-1.5223	-0.0031	0.0490	-0.0190	-0.5892	0.5661	1.6381	0.3411
Engineering	(1.9032)	(0.4029)	(0.0315)	(0.0169)	(0.0106)	0.3532		0.7746	(0.1788)
Electrical	1.4339	-0.4787	0.0233	0.0534	-0.0021	-0.6654	0.9566	1.4194	-1.0403
Engineering	(0.7932)	(0.2153)	(0.0173)	(0.0074)	(0.0043)	(0.1498)		1.2350	(0.9223)
Ship-	1.3407	-0.3911	-0.0374	0.0628	-0.0579	-0.6968	0.3787	1.0781	-1.6525
building	(8.0813)	(0.4909)	(0.1754)	(0.0530)	(0.0306)	(0.4388)		2.8608	(3.0079)
Vehicles	7.0101	-1.2663	-0.0146	0.0550	-0.0194	0.2580	0.8764	1.0994	0.1988
	(1.3959)	(0.3959)	(0.0261)	(0.0235)	(0.0100)	(0.2449)		1.9224	(0.2387)
Precision	4.1547	-0.3029	0.0070	0.0176	-0.0134	-0.0590	0.6182	1.7131	-2.2783
Instruments	(0.7549)	(0.1457)	(0.0147)	(0.0063)	(0.0035)	(0.1430)		0.6098	(1.5942)

Table 6.2 cont.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
SECTOR	b_0	b_1	b_2	b_3	b_4	b_5	$\bar{R}^2$	DW/h	α
Metal goods n.e.s.	6.6498 (4.3221)	-3.4405 (1.4833)	-0.0031 (0.0716)	0.0701 (0.0368)	-0.0140 (0.0190)	0.3038 (0.8322)	0.3535	2.0704 -0.1567	0.7084 (0.1265)
Textiles	5.4084 (1.4039)	-0.2469 (0.1194)	0.0322 (0.0178)	0.0211 (0.0108)	-0.0119 (0.0060)	-0.2983 (0.2735)	0.7638	1.1699 1.7660	-2.9198 (1.8644)
Leather	3.2563 (0.7380)	-0.4835 (0.0880)	-0.0398 (0.0120)	0.0218 (0.0056)	-0.0018 (0.0030)	-0.2395 (0.1404)	0.8255	1.3735 1.3307	-3.2114 (0.3895)
Clothing	5.6380 (0.3648)	-0.1838 (0.1255)	0.0192 (0.0050)	0.0132 (0.0031)	-0.0037 (0.0014)	-0.1045 (0.0713)	0.8559	1.3418 1.3965	-4.3362 (3.6584)
Food	4.8653 (0.5833)	-0.4067 (0.1845)	0.0120 (0.0082)	0.0276 (0.0491)	-0.0032 (0.0025)	-0.1834 (0.1126)	0.8938	0.6691 2.8250	-1.4293 (1.0927)
Drink	4.5503 (0.5281)	0.7804 (0.1782)	0.0195 (0.0098)	0.0046 (0.0039)	-0.0019 (0.0021)	0.0753 (0.9439)	0.8092	1.3963 1.2818	2.2564 (0.3574)
Tobacco	3.5494 (0.6713)	-1.9308 (0.6066)	0.0009 (0.0089)	0.0203 (0.0067)	-0.0003 (0.0027)	-0.0660 0.1335	0.3097	1.6190 0.8088	0.4825 (0.1614)
Timber & Furniture	4.6695 (0.7767)	-0.2829 (0.0888)	-0.0167 (0.0104)	0.0317 (0.0057)	-0.0063 (0.0029)	-0.1257 (0.1448)	0.8755	1.4174 1.2371	2.5938 (1.1358)
Paper & Printing	6.2661 (0.3332)	0.0039 (0.0332)	0.0024 (0.0038)	0.0169 (0.0025)	-0.0030 (0.0014)	0.1188 (0.0627)	0.9782	1.7601 0.5090	256.7949 (2175.1676)
Mining and Quarrying	3.7139 (2.3658)	0.4406 (0.3149)	0.2102 (0.2720)	-0.0105 (0.0242)	-0.0070 (0.0131)	-0.3023 (0.2952)	0.4244	1.3519 1.3812	2.7925 (0.8018)
Gas, Electricity & Water	5.0181 (0.3352)	0.1472 (0.1139)	-0.0006 (0.0059)	0.0223 (0.0021)	0.0007 (0.0011)	0.0187 (0.0585)	0.9923	1.0655 1.9831	7.7976 (5.2822)

Standard erros are given in brackets below the coefficient estimates and the points estimate implied for the parameter α is given in Col. 10 with its associated asymptotic standard error. The figure given below the Durbin Watson statistic in Col. (9) is Durbin's h statistic

statistic, serial correlation appears to be present in about the same number of cases as in Table 6.1 but not necessarily in the same equations. For manufacturing, for instance, it disappears altogether while, for industrial production, it becomes more serious. The difference between the two aggregate equations stands out sharply when looking at the coefficient b_1 which, for industrial production, is positive but not significant and for manufacturing is negative and highly significant. This clearly explains much of the difference in the overall performance of the two equations and might be due to the use of too wide a price index for industrial production (the GDP deflator)

but the results for individual industries seem to bear out the distinction.

In 14 out of 19 industries, the coefficient b_1 is negative and in 12 of these, significantly so and this preponderance is even greater in manufacturing alone where all of the negative coefficients appear. However the values of a_1 implied by the point estimates are unreasonable, ranging across both positive and negative values, although in only 6 cases are they significantly different from zero. In view of the apparently widespread finding of decreasing short run returns to labour in Table 6.1, these results should hardly be surprising. What is surprising is that, despite the failure to identify a "reasonable" production function, the estimated demand curves appear to be predominantly downward sloping.

It might have been expected that the exclusion of output from the equation would raise the size and significance of the coefficient on the lagged dependent variable. This is not the case, however, and the estimates of b_2 are not substantially larger or more significant than

a_2 in Table 6.1. As before, with the exception of mining and quarrying adjustment is almost complete within each period and, in nine of the industries, the coefficient b_2 gives a negative sign. The time trend coefficients are much less ambiguous than in Table 6.1. With the exception of mining and quarrying, the coefficient b_3 is always positive and almost always significant. The trend dummy is, with the exception of two industries, always negative though only significant in seven cases and not in the aggregates. Hence the results are consistent with the model though not with more rapid productivity growth in the 1930's.

The results for the benefit to wage ratio, are much less clear cut and, in aggregate, b_6 takes a negative sign which is significant for the manufacturing sector. This is reflected in the industry equations where the sign of the coefficient varies, only giving significant coefficients in four cases. This is not altogether surprising since the effects might run in both directions. If the results of Table 6.1 are interpreted as indicating some net dishoarding of labour contingent upon increases in benefits, then this has the effect of reducing employment at every level of output which would be equivalent to increasing productivity. This might, in turn, shift the labour demand curve outwards raising output and offsetting the direct downward shift in employment. If this were so, then, given the real wage, the output supply curve would shift out with increases in the benefit to wage ratio. If the effects found in Table 6.1 reflect the substitution of hours for workers on the other hand, as long as it is assumed that the marginal product of hours and workers are the same, the benefit to wage ratio will not shift the output supply function.

The output supply function is based upon the equation of desired output (6.4) from the first order conditions. This is augmented as

before with the shift terms and a first order adjustment process this time, in output. In logs the estimating equation is

$$\ln Q_t = c_o + c_1 \ln(\frac{W}{P})_t + c_2 \ln Q_{t-1} + c_3 t + c_4 Dt + c_5 - \ln(\frac{B}{W})_t + \varepsilon_{3t} \tag{6.7}$$

where $c_1 = \frac{-\lambda\alpha_1}{1-\ _1}$, $c_2 = 1-\lambda$, $c_3 = \frac{\lambda\alpha_2}{1-\alpha_1}$ and c_4 and c_5 are the shift coefficients.

As with the unconstrained employment functions, the equations of Table 6.3 give a surprisingly high level of explanatory power and, although there is evidence of serial correlation in the industrial production estimate, it is absent for manufacturing and for individual industries with four exceptions. The results of Table 6.3 are also strongly supported in other respects. The coefficient c_1 indicates an upward sloping supply curve for output in manufacturing but not for industrial production as a whole and this is, to a large extent, reflected in the coefficients on the industry equations where the twelve negative coefficients are all in manufacturing industries.

The point estimates of α_1 give values which lend much more support to the simple production function than the employment equation. All but one of the industry equations gives a value which falls less than one standard error away from the interval between zero and one. Among the more well determined coefficients, the point estimate frequently falls near the middle of this range. Hence the results suggest that, while the determinants of output lend some support to the model, the reason for the inconsistency between this and the unconstrained employment function lies largely in the relationship between output and employment which was demonstrated in Table 6.1. This appears consistent with the n otion that some part of observed employment is fixed in the short run

Table 6.3

Output Equations for U.K. Industries, 1921 - 1938

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
SECTOR	c_o	c_1	c_2	c_3	c_4	c_5	$\bar{R}^2$	DW/h	α
Industrial Production	4.3877 (1.5204)	3.6756 (0.1618)	0.1074 (0.0418)	0.0071 (0.0225)	-0.0099 (0.0059	0.2086 (0.2677)	0.9142	1.0110 2.1316	1.3207
Manufacturing Industries	4.9722 (0.9118)	-0.6792 (0.1149)	0.0063 (0.0186)	0.0515 (0.0061)	-0.0037 (0.0038)	0.0994 (0.1693)	0.9666	1.8403 0.3398	0.4060 (1.2027)
Building Materials	11.5204 (2.1709)	-0.3628 (0.3083)	-0.1394 (0.0385)	0.0676 (0.0117)	0.0212 (0.0062)	1.3562 (0.4101)	0.9315	1.5146 1.0437	0.2415 (0.1548)
Chemicals	3.8122 (1.2663)	-0.8202 (0.2071)	0.0215 (0.0247)	0.0534 (0.0076)	-0.0004 (0.0044)	-0.1423 (0.2251)	0.9558	1.6874 0.6668	0.4560 (8.4967)
Ferrous Metals	9.8631 (5.1898)	-1.8560 (0.7312)	-0.0710 (0.1446)	0.0630 (0.0236)	-0.0201 (0.0139)	0.8796 (0.8426)	0.7577	2.2099 -0.5639	0.6664 (0.0691)
Mechanical Engineering	3.9930 (2.3746)	-1.1945 (0.4351)	0.0657 (0.0540)	0.0522 (0.0182)	-0.0219 (0.0115)	-0.0845 (0.4385)	0.7271	1.4498 1.1991	0.5611 (0.0924)
Electrical Engineering	5.3026 (1.5021)	-1.2890 (0.3947)	-0.0551 (0.0375)	0.0832 (0.0135)	-0.0121 (0.0078)	0.1366 (0.2841)	0.9406	1.4510 1.1796	0.5499 (0.0775)
Ship-building	-15.0280 (13.3635)	0.1504 (1.0663)	-3.5458 (2.4219)	0.1295 (0.1365)	-0.0841 (0.0779)	-3.4575 (2.4219)	-0.0086	1.2425 ——	-0.0342 (0.2523)
Vehicles	2.7820 (3.2213)	0.1131 (0.8945)	0.0509 (0.0826)	0.0913 (0.0554)	-0.0274 (0.0231)	-0.2167 (0.5639)	0.8565	0.8165 2.6805	-0.1353 (1.2233)
Precision Instruments	3.8787 (0.9490)	-0.5069 (0.1844)	0.0157 (0.0185)	0.0508 (0.0079)	-0.0147 (0.0044)	-0.1216 (0.1798)	0.9277	1.5054 1.0524	0.3399 (0.0831)
Metal Goods n.e.s.	5.1335 (1.2995)	-1.9630 (0.4442)	0.0157 (0.0258)	0.0735 (0.0109)	-0.0115 (0.0058)	0.1738 (0.2502)	0.9478	1.4460 1.1824	0.6660 (0.0543)
Textiles	2.7021 (2.0566)	-0.4064 (0.1834)	0.0502 (0.0422)	0.. (0.0155)	0.0054 (0.0090)	-0.3347 (0.4001)	0.6691	1.9203 0.1719	0.2997 (0.2762)

Table 6.3 cont.

(1) SECTOR	(2) c_o	(3) c_1	(4) c_2	(5) c_3	(6) c_4	(7) c_5	(8) R	(9) DW/h	(10) α
Leather	7.6670	-0.3672	0.0318	0.0089	0.0045	0.6648	0.9112	2.0667	0.2750
	(1.2716)	(0.1411)	(0.0208)	(0.0088)	(0.0048)	(0.2420)		-0.1420	(0.0764)
Clothing	5.0821	0.0349	0.0051	0.0253	-0.0059	0.1290	0.9786	2.6105	-0.0364
	(0.4203)	(0.1438)	(0.0080)	(0.0035)	(0.0016)	(0.0822)		-1.2958	(0.1551)
Food	3.3555	-0.3406	0.0255	0.0451	0.0003	-0.2087	0.9932	1.7054	0.5082
	(0.3894)	(0.1265)	(0.0073)	(0.0033)	(0.0017)	(0.0769)		0.6252	(0.0720)
Drink	3.2785	2.4631	0.0422	0.2463	0.0043	-0.0671	0.7029	1.7163	1.6363
	(1.2685)	(0.4202)	(0.0225)	(0.4202)	(0.0051)	(0.2284)		0.6046	(0.1938)
Tobacco	6.1358	0.1915	-0.0237	0.0352	0.0059	0.3273	0.9175	0.8801	-0.2301
	(1.2497)	(0.1115)	(0.0136)	(0.0125)	(0.0049)	(0.2486)		2.3795	(1.6490)
Timber & Furniture	8.3471	-0.3401	-0.0124	0.0537	-0.0104	0.7778	0.9720	1.2837	0.2515
	(1.4048)	(0.1471)	(0.0229)	(0.0092)	(0.0049)	(0.2620)		1.5268	(0.0818)
Paper & Printing	4.5656	-0.0264	0.1106	0.0233	0.0006	0.1150	0.9777	2.9004	0.0288
	(1.0112)	(0.0934)	(0.0152)	(0.0069)	(0.0039)	(0.1900)		-1.9140	(0.3134)
Mining and Quarrying	3.6853	0.8585	0.0067	-0.0048	-0.0033	-0.0648	0.0687	1.2576	-6.3687
	(2.2601)	(0.3780)	(0.2402)	(0.0293)	(0.0161)	(0.3633)		0.3712	(12.0065)
Gas, Electricity and Water	3.9222	0.8824	0.0278	0.0635	-0.0025	0.0426	0.9917	1.2926	-0.0306
	(0.8612)	(0.2794)	(0.0169)	(0.0052)	(0.0029)	(0.1516)		1.5046	(35.0017)

Standard errors are given in brackets below the coefficient estimates and the point estimates implied for the parameter α is given in Col. (10) with its associated asymptotic standard error. The figure given below the Durbin Watson statistic in Col. (9) is Durbin's h statistic.

and is not treated by firms as a variable factor though the exact reasons for this remain unclear[1]. It also suggests that increasing short run returns to labour found in traditional employment functions are not necessarily inconsistent with the finding of the conventional downward sloping labour demand and upward sloping output supply schedules.

As before, adjustment appears to occur almost wholly within the year and among the individual industries, the lagged dependent variable gives a negative sin in six cases. The trend coefficients are also similar in that, with the exception of mining and quarrying, c_2 takes a positive coefficient thoughout and the time trend dummy is negative in the aggregates and only significant when negative among the industries. The other shift term, the benefit to wage ratio is generally positive though rarely significant. This lends only very weak support to the idea that a shake out of labour raised the profit maximising output level.

The overall findings of this section shed an interesting light on the Keynes-Dunlop-Tarshis debate. It indicates that, though for aggregates such as GDP or industrial production, labour demand curves are not found to be downward sloping, for the all important manufacturing sector, they are.

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[1] Using this approach, if one were to take the coefficient α_1 in Table 6.3 as an estimate of the "true" labour parameter and that of Table 6.1 as a biased estimate of it due to the fixity of some part of employment, then the proportion of fixed labour can be calculated from the two coefficients. From the expression on p.6.4 , the ratio of fixed to total employment is

$$\frac{E_f}{E} = 1 - \frac{\hat{\alpha}_1(6.3)}{\hat{\alpha}_1(6.1)}$$

Thus, for manufacturing as a whole, it would be

$$1 - \frac{0.4060}{1.4275} = 0.72$$

which is an uncomfortably high proportion. Both the difficulties in interpretation and the uncertainty surrounding the price data to be against simply accepting such a result at face value.

Thus disaggregation is an important key to gaining further insights on this issue. However, one should not necessarily conclude that in the manufacturing sector at least there was Classical Unemployment. For one thing, not all industries exhibit the same tendency and, in any case, it is possible that there were switches of regime in any one industry across time. Furthermore, it was largely the manufacturing sector which competed in foreign markets and particularly in engineering, metals and textiles where the strongest results appear. It is therefore possible that the price terms are acting as proxies for international competitiveness rather than for domestic prices relative to variable costs. This would be consistent with the finding of strongly significant relative price effects on exports in the previous chapter. Similarly it would allow Keynesian unemployment consistent with increasing short run returns but in which the quantity rationing was determined largely by the level of international competitiveness.

6.4 Labour Market Flows and Unemployment

It is now a commonplace that the unemployed cannot be simply described as a standing army or a stagnant pool since there is continuous entry and exit. Thus the pool of unemployed is not stagnant but is a resevoir whose level at anytime depends on the cumulative inflows and outflows and in which the current change in level depends on the current balance of these flows. In the postwar period, it has been found that, for some groups, a fifth or more of the labour force flowed on to the register in any year[1].

The relation between stock changes and the different types of flows for the three major stocks of employed, unemployed and those not in the labour force, can be examined in the simplified framework laid out by Holt and David (1966, p. 78):

$$E_t - E_{t-1} = h + c - r - q - \ell \tag{6.8}$$

$$U_t - U_{t-1} = q + \ell + e - w - h - c \tag{6.9}$$

$$F_t - F_{t-1} = b - d + w - e + r \tag{6.10}$$

where the current period flows (between t-1 and t) are defined by the lower case letters as h = hires, c = recalls, r = retirements, q = quits, ℓ = layoffs, e = entrants, w = withdrawals, b = births and d = deaths. In this simple classification, exits from the labour force (i.e. into the

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[1] Cripps and Tarling estimated annual inflows on to the unemployment register as a proportion of employment for 1966 at between 10% and 30% for different age groups and between 10 and 20% for across different regions (1974, pp. 308-309). Similar orders of magnitude have been calculated for 1972 by Nickell (1980 p. 780) and for 1978 by Stern (1982, pp. 7, 11).

not in labour force category F) are termed withdrawals if they are from unemployment, U, and retirements if they are from employment, E, though in each case they would include all exits including death, retirement, sickness etc. Similarly, entrants into the labour force are assumed to enter unemployment in the first instance. Variations in the labour force can thus be summarised as the net change in employment and unemployment

$$L_t - L_{t-1} = e - r - w \qquad (6.11)$$

If rates of flow off the register can be measured, then, provided the level is not changing, the average duration of unemployment can be calculated. If workers are identical in that they do not have characteristics which affect the duration of their spell of unemployment, this also gives the expected duration of a worker entering unemployment. If all workers on the register have the same probability of leaving unemployment in any week, then this probability is the inverse of average duration, D_u, (e.g. in weeks). Thus where $U_t = U_{t-1}$ average duration can be calculated as the ratio of the stock to the inflow or outflow (in weeks)

$$D_u = \frac{U}{w+h+c} = \frac{U}{r+\ell+e} \qquad (6.12)$$

and the probability of leaving unemployment is $P_u = \frac{1}{D_u}$ [1]. If the same

[1] It is well known that the probability of leaving the register is not constant and that it decreases with length of time unemployed. This might be due to length of unemployment itself reducing re-employability and/or the fact that workers enter the register with different exit probabilities and. given this, higher proportions of those with high durations have low exit probabilities which lowers the average exit probability for the group as a whole. Some evidence of this latter effect has already been considered in the relatively high proportions of long term unemployment amongst older workers. According to Beveridge, these longer durations reflected low re-employment probabilities. Quoting from his earlier work, he re-emphasised that "the adverse effect of advancing years is seen less when it is a question of retaining old employment than when it is a question of finding new employers" (1944, p. 71).

assumptions are made for employment, average employment duration D_e can be calculated as

$$D_e = \frac{E}{h+c} = \frac{E}{r+q+\ell} \qquad (6.13)$$

and the rate of turnover or the probability of leaving employment is $T_e = \frac{1}{D_e}$. It is also useful to express the flow between employment and unemployment as a proportion of the labour force $T_\ell = \frac{h+c}{L}$. If labour force exit and entry is ignored, the unemployment rate can be expressed as

$$\frac{U}{L} = T_\ell \times D_u \qquad (6.14)$$

Thus when $e = r + w$, for those workers not leaving or entering the labour force, the unemployment rate is the product of labour force turnover and average unemployment duration.

These various magnitudes could be calculated if rates of flow on and off the unemployment register could be found but such information is not readily available. It is possible to make approximation, however, using the procedure suggested by Beveridge (1944, p. 80) of applying the placing index (i.e. the ratio of vacancies filled by exchanges to the number of worker leaving the register for employment) to the total number of vacancies filled by the exchanges to give an estimate of the total flow into employment. The placing index applies only to the wholly unemployed and hence, though the proportion is probably not large, to the extent that re-engagements among the temporarily stopped are included in the vacancies filled statistics, the rate of flow for the wholly unemployed will be over-estimated[1].

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[1] It is likely (though not known) that most of recalls of those temporarily laid off was direct, rather than through the exchanges since, in most cases, the worker would still be closely linked with the firm or would have been laid off for a fixed period and told when to return.

Using this calculation and applying it to the annual average of wholly unemployed using equation 6.12 gives the estimate of average duration (for those not leaving the labour force) in Table 6.4. The figures are somewhat distorted for juveniles because of the inclusion of 14 and 15 years olds in the scheme in September 1934[1]. Comparison with the upper panel of the Table shows that the decline in the rate of wholly unemployed between 1932 and 1937 was largely, though not entirely, due to a decline in duration which holds for all groups. Furthermore, a substantial part of the differences in unemployment rates for different groups is accounted for by differences in average duration. Some check on the figures is possible by comparison with the results of Cripps and Tarling who calculated average duration for the wholly unemployed using data on the proportions in different duration groups under the assumption of a stationary register at selected dates. This gave an average duration for adult males of 18.4 weeks in April 1933 and 14.4 weeks in April 1937[2].

The striking aspect of these average durations is that they are so low compared with the unemployment rates and the bottom panel shows that this is due to high rates of turnover[3]. On average it reflects a movement from wholly unemployed into employment for each worker every two years. Surprisingly the turnover rate is lower for adult females than for the other groups but this is probably due to the higher proportion

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[1] This tends to raise the rate of flow into employment from unemployment for juveniles aged 16 - 17 because, prior to 1934, many would not have come onto the register until they had once been in insured employment. Once the insurance system was extended to younger age groups, these juveniles would be more likely to have experienced a spell of insured employment.

[2] These figures were calculated from Cripps and Tarling (1974), Table IV, p. 306 on the assumption of a 5½ day week.

[3] Cripps and Tarling found that the rate of inflow fell dramatically in the post-war period before rising again after 1966.

Table 6.4

Unemployment, Duration and Labour Turnover 1932-38

	1932	1933	1934	1935	1936	1937	1938
			% Wholly Unemployed				
M	19.9	19.0	16.2	15.1	12.9	10.3	15.4
W	9.3	8.2	7.0	7.1	6.7	6.2	8.1
B	10.9	10.4	11.3	5.8	4.7	3.1	3.6
G	10.2	10.1	11.2	6.6	5.9	4.0	4.8
All	15.8	15.0	12.9	12.2	10.4	9.2	9.8
			Average Duration (Weeks)				
M	16.6	14.4	12.8	11.0	11.1	9.9	9.9
W	10.7	9.2	8.0	7.8	7.5	6.8	8.5
B	7.4	6.2	4.7	3.6	2.7	2.0	2.5
G	6.0	5.3	3.9	3.4	3.1	2.2	2.8
All	15.3	13.4	11.8	10.4	10.4	9.2	9.5
			Annual Labour Turnover %				
M	62.5	68.8	66.6	71.0	60.2	54.0	56.0
W	45.5	46.5	45.6	47.8	46.9	46.5	45.9
B	77.0	86.9	125.3	84.8	89.8	79.6	75.2
G	88.3	98.0	152.1	102.1	97.6	95.5	90.0
All	53.5	58.5	56.6	60.9	52.2	52.2	53.5

Sources: Wholly unemployed calculated from monthly totals for the U.K in the Ministry of Labour Gazette, Labour force at the mid-year card count from 22nd Abstract of Labour statistics, pp. 15-16 and the Gazette. The flow into employment was calculated by dividing the placing index given by Beveridge, 1944, Table 14, p. 80 into the annual totals of vacancies filled from the Gazette and converted to a rate using the figures for insured population.

of men entering casual and relief work and returning to former employers. In his estimate for 1937 Beveridge found that, of the 9 million engagements of wholly unemployed workers, about 30% were returns to the last employer so that the labour force turnover rate for new

employment was about 45% per annum[1].

These calculations, however, largely exclude those among the unemployed categorised as "temporarily stopped" or "normally in casual employment". The former were only distinguished from 1926 and were defined by the Ministry of Labour as including"those persons recorded as unemployed on the date of the return who were either on short time or were otherwise stood off or suspended on the definite understanding that they were to return to their former employment within a period of six weeks from the date of suspension" (Ministry of Labour Gazette, February 1926, p. 54). Thus this category appears to capture for the most part, those workers who were temporarily laid off including those who might have been claiming unemployment benefits under the 'OXO' system. Beveridge's table illustrates that these were a significant proportion of the unemployed as has already been observed.

The proportion of temporarily stopped is surprisingly high and, even though it falls in the recovery of the 30's, it still accounts for 13% even in the boom year of 1937. Together with the casuals these figures reflect groups with extremely low durations and probably high turnovers.

Despite being a minority of the unemployed, these groups would dominate flows on and off the register. In a sample enquiry conducted by the Ministry of Labour for the year ended January 1931, it was found that only 27.3% of claimants had just one spell of unemployment and that

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[1] Some more detailed information is available for the 6 months ending December 26th from Chegwidden and Myrdin-Evans (1934) Appendix 1, pp. 236-238. From this it was calculated that 43.2% of adult males and 37.2% of adult females returned to their old employer while the proportions entering casual and relief employment were 25.3% and 19.4% respectively. Given the depressed conditions of 1932, these proportions are probably higher than at other times and not inconsistent with the figure given by Beveridge.

Table 6.5

	Wholly Unemployed	Temporarily Stopped	Casual Workers
1928	69.3	24.6	6.1
1929	72.1	21.5	6.4
1930	68.1	26.7	5.0
1931	73.9	21.8	4.3
1932	75.9	20.4	3.7
1933	78.7	17.6	3.7
1934	79.4	16.6	4 .0
1935	81.0	14.9	4.1
1936	81.9	13.8	4.3
1937	82.5	13.2	4.3
1938	76.2	20.2	3.6
Average 1928-38	76.3	19.2	4.5

Source: Beveridge (1944) Table 11, p. 68

18.3% had more than ten spells. The average number of spells per claimant was 7.3, average duration 20.8 days and some 63% of claims were for less than 6 days which would predominantly be the temporarily stopped and casuals. Thus even though across all groups, the average spell was less than three weeks, the average amount of unemployment per claimant was 27.5 weeks or more than six months (Royal Commission on Unemployment Insurance Final Report, p. 71-2). It appears from this that as far as individuals were concerned, it was not just among the long term unemployed that unemployment was concentrated among a minority - when durations were very short they often reflected repeated spells.

In a study of flows across the register in the late 1930s, H.W.Singer found that changes in the stocks of unemployed were determined largely by variations in rates of inflow rather than rates of outflow. In high unemployment regions the probability of leaving the register in

any three month period, was lower and the proportion of the insured flowing onto it was higher. This indicates that high regional unemployment rates arose both from longer duration and high turnover[1]. It is likely that, given their occupational structure, temporary layoffs were more common in the North and that, insofar as there were repeated spells connected for the purposes of claiming benefit, much of what would otherwise be long term unemployment was concealed.

We turn finally to the category of flows so far omitted - movements into and out of the insured labour force. The Ministry of Labour regularly reported the number of new entrants, i.e. those who had not been in insurance before and these are given as a proportion of the insured population in the last column of Table 6.6. These consist partly of workers who were changing from uninsured to insured occupations but is dominated largely by the entry of juveniles seeking or obtaining their first job. The Ministry also calculated net exits, given in Col. 2 by deducting the total change in the insured labour force from new entrants. Thus the gross flows of entrants including re-entrants cannot be ascertained. However, the numbers in the Two Months file were also reported and this may be interpreted as a very crude measure of gross outflow. This is estimated roughly by taking the average of quarterly observations on the numbers in the Two Months file and multiplying by six.

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[1] Singer (1939) calculated rates of flow onto the register per quarter which gave averages of 52 per thousand for the four southern divisions and 89 per thousand for the five northern divisions. The annual percentage rate of flow for Great Britain emerging from these figures is 28%. This appears to be a considerable underestimate because no account was taken of those flowing in and out within the three month period and, hence, Singer's flow rates are affected by regional differences in the average length of short durations.

Table 6.6

Flows Into and Out of Insurance 1926-37

Year ended June	(1) New Entrants (% of Insured)	(2) Exitants less Re-entrants (% of Insured)	(3) Two Months file % insured
1926	7.6	6.3	5.7
1927	7.2	6.3	6.1
1928	7.2	6.4	5.4
1929	7.0	5.2	4.4
1930	7.0	4.4	4.0
1931	6.4	3.4	4.4
1932	5.7	5.4	6.7
1933	5.4	4.8	5.3
1934	5.4	4.9	4.2
1935	5.7	5.0	4.0
1936	7.1	5.1	3.5
1937	6.6	4.3	3.0

Sources: Cols. (1) and (2) from Ministry of Labour Gazette, Nov. 1937 p. 421, Col. (3) calculated as an average of quarterly totals given in Burns (1941) Table 1, p. 343, expressed as a proportion of total insured in Great Britain from 22nd Abstract of Labour Statistics, p. 14.

The result in Col. (3) compares reasonably well with Col. (2) though it is somewhat lower. This suggests that reentrants were probably not a large proportion of the insured. It seems likely that most of the movements were permanent changes connected with different stages in the typical lifecycle. Among new entrants the effect of falling birth rates during the First World War is very clear as is the post war rise and, fortuitously, this serves to reduce the inflow during the depression of the early 1930s. The low rate of exit in the 1930-1 and high rates in 1932-33 which are reflected in the residual change in the

insured population and in the Two Months file are clearly associated with the genuinely seeking work clause and the anomalies regulations. Though the evidence is not very firm, it seems likely that some of those affected subsequently reentered, though it would not have been common at other times.

6.5 Quarterly Variations in Employment and the Insured Labour Force 1924-39

If sufficient flow data were available, it would be possible to conduct estimation which could shed further light on changes in the stocks represented by insured employment and unemployment so far examined only on annual data. One implication of large scale flows across the unemployment register and especially the high proportion of temporary layoffs is that stock adjustments could be made through small alterations in rates of flow. Increases in demand for labour could be met almost instantly be recalling those on temporary layoff, hiring casuals or contacting the employment exchange. The evidence from employment functions bears this out, at least on annual data.

A stringent test of this general view is to examine the determinants of quarterly changes in employment, unemployment and the labour force. As illustrated previously, the net change in any stock is simply the balance of gross flows and, hence, the determinants of such stock changes should embody the determinants of the various inflows and outflows. With these considerations in the background, we proceed in this section to build an explanation of quarterly changes in unemployment by analysing changes in employment and the labour force before considering unemployment directly in the following section.

An important reason for examining quarterly changes is to provide further tests of the impact of unemployment benefits. It is possible that annual data used in levels was affected to some extent by differences in coverage and methods of counting, not to mention structural change. This might have affected the levels but would be less serious when the data is converted to changes. Furthermore, in the recent discussion of

the impact of unemployment benefits, it appears to have been accepted that one is unlikely to obtain very accurate point estimates of the effect of benefits when using only 18 or so annual observations. (Benjamin and Kochin, 1982, p. 413, Metcalf et al., 1982, p. 395). However, despite the availability of quarterly data for the period, this has not been resorted to in order to increase the number of degrees of freedom in time series estimates.

The model used for employment is essentially the same as that used on annual data and similar quarterly series are therefore required. These were drawn largely from the quarterly data base conveniently provided by the Ministry of Labour for 1924 onwards given in the Ministry of Labour Gazette[1]. The maximum period for which these are available is from 1924I to 1939II just prior to the outbreak of war, giving a total of 62 observations in all. The employment totals, wage rate and wholesale price indices are all available for the entire period. There is no quarterly national income series and the Ministry's quarterly industrial production series begins only in 1928 and so, for earlier quarters, the London and Cambridge series was used suitably spliced in 1928[2]. For unemployment benefits, the table of rates given in Burns (1941) was again used applying the same weights but converting to a quarterly basis. (See earlier discussion, pp.4.13).

The equations are specified in first differences of logarithms to give proportionate rates of change and thus the exponential trend term appears as the constant in the equation. The notation is as before with Q being industrial production, W/P the wage relative to wholesale price

[1] The whole set of data can be obtained from two Supplements to the Gazette, August 1932 and February 1940.

[2] This was obtained from the L.C.E.S. Bulletin for January 1934, p. 14.

and B/W the benefit to wage ratio. The equations reported in Table 6.7 are for Keynesian and Classical Models of employment with both the real wage and output included in equation (3). Given that the specification is in pure first differences, the equations (1) and (3) which include output give a remarkably good fit though equation (2) which excludes output, fails totally. Surprisingly, when both output and the real wage are included, the latter becomes significant with a negative sign. It is likely that the wholesale price series is more representative of raw material inputs than of final outputs and, hence, it may be picking up the effects of relative input prices.

Table 6.7

Eq. No.	Const.	$\Delta \ln Q_t$	$\Delta \ln(W/P)_t$	$\Delta \ln(B/W)_t$	$\bar{R}^2$	RSS	D.W.
1	-0.0100 (0.0029)	0.2605 (0.0164)		-0.0665 (0.0495)	0.8198	0.0059	2.3441
2	0.0091 (0.0063)		-0.0960 (0.1131)	-0.0864 (0.1169)	-0.0024	0.0328	1.3867
3	-0.0104 (0.0027)	0.2637 (0.0151)	-0.1452 (0.0444)	-0.0528 (0.0458)	0.8460	0.0049	2.4849

4 $$\Delta \ln E_t = \underset{(0.7545)}{2.3515} + \underset{(0.0159)}{0.2595}\,\Delta \ln Q_t + \underset{(0.0285)}{0.0648}\,\ln Q_{t-1} - \underset{(0.0432)}{0.1534}\,\Delta \ln(W/P)_t$$

$$- \underset{(0.0280)}{0.0902}\,\ln \frac{W}{P}_{t-1} - \underset{(0.0946)}{0.2901}\,\ln E_{t-1} + \underset{(0.0004)}{0.0012}t$$

$\bar{R}^2 = 0.8635$ RSS = 0.0414 D.W = 2.2122

(Seasonals included but not reported)

No strong emphasis is laid on the particular values of the point estimates for output and the real wage since both measures are not fully representative and are likely to be more volatile than the wider measures

of the output and price of insured industries would be if they were available. It is notable that, in these equations, the benefit to wage ratio is never significant at the 5% level though, as in the industrial employment functions, it does better in equations with only output. Thus an important result appears to be the disappearance of the benefit effects or employment which were shown to underlie the annual estimates where quarterly differences are used.

It is possible that by constraining to first differences important dynamics affecting the variables in different ways are missed out. As a test of the first difference formulation against an equation in pure levels or one in levels with first order dynamics, the lagged level of each variable (including the dependent and a time trend) were added to the equation. This more general model was then tested against the first difference specification for each of equations (1) - (3) using the F test[1]. This does not reject first differences for equation (1), rejects it for equation (2) and is almost exactly on the borderline of 5% significance for equation (3)[2]. None of the terms in the benefit to wage ratio was significant at any time and, hence, these terms were dropped and the equation re-estimated with differences and lagged levels as given in equation (4). It appears that a dynamic specification is appropriate when the real wage term is included but not otherwise. It

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[1] In the simple bivarate case, the test for Y on X in first differences gives the null hypothesis H_o, $\Delta Y_t = \beta_1 \Delta X_t$ with the alternative as H_1, $\Delta Y_t = \beta_1 \Delta X_t + \beta_2 X_{t-1} + \beta_3 Y_{t-1}$. If the time model is in first differences, then $\beta_2 = \beta_3 = 0$ and if the true model is in levels, then $\beta_2 = \beta_1$ and $\beta_3 = -1$. If a dynamic specification in levels is indicated, then the coefficients β_2 and β_3 may take on other values. Thus performing the best for the joint significance of lagged levels tests the first difference specification against these alternatives.

[2] The computed F statistics were 0.72, 3.60 and 2.34 respectively and the critical values are 2.55, 2.55 and 2.40.

is possible that these effects were too subtle to be picked up on annual data though this may simply be the result of the inadequacy of the particular wholesale price index.

We turn to the other side of the labour market for an examination of quarterly changes in the insured population. It has been noted at several points in the discussion that variations in the insured population were affected by a whole range of legislature and administrative changes. The Ministry of Labour often evaluated the short run effects of such changes by examining the flow of insurance books through the Two Months file. If, as was suggested in the previous section, the Two Months file closely reflects the outflow from insurance, it is useful to see if this flow can be accounted for in regression analysis. To the extent that this can be explained, the impact of various influences determining the size of the labour force can be accounted for. To do this we need a variable which can act as a proxy for the effects of legislative and administrative change. Easton (1978, p. 158) and, following him, Benjamin and Kochin (1982, p. 412) used the number of claims admitted by the insurance and supplementary systems as a proportion of books lodged as a measure of the severity with which the system was enforced. However, among the claims not admitted were those serving waiting days and those disqualified from benefit. For the purposes of determining the flow out of insurance it seems that the rate at which claims were being disallowed would be a more appropriate variable and this has been used to explain postwar flows off the register by Nickell (1982).

This information was reported regularly in the Gazette from the last quarter of 1924 but there are some problems in using it. The main one is that the types of claims referred to and the machinery for evaluating them changes over time. From November 1924 to April 1928

they are for claims to extended benefit adjudicated by local Employment Committees. From May 1928 to March 1930 they include all claims including both those decided upon by Insurance officers and those decided on appeal to Courts of Referees. From then until October 1935, the system changed, narrowing the jurisdiction of Insurance Officers such that only Courts of Referees had the power to disallow. A further change occurred in November 1935 when Insurance officers were re-empowered under certain circumstances. These changes caused sharp breaks in both the numerator number of disallowances and the denominator number of claims such that the ratio fell from about 15% in the first period to 9% in the second and 7% in the third, rising slightly in the fourth.

In specifying the model for the Two Months file we take the Burns series on the total number of books in the Two Months file at a date near the end of each quarter from 1924I to 1939I as representing the current rate of flow off the register[1]. This is, therefore, explained using first differences of variables thought to determine labour supply, namely the benefit to wage ratio and the wage relative to cost of living index, termed C (also given as a quarterly series by the Ministry). Another variable included is the unemployment level (in absolute numbers) in an effort to capture the net impact of added and discouraged worker effects. If the discouraged worker effect dominates, then labour supply will be smaller the higher is unemployment, due to the rationing of job opportunities that the latter represents. Finally the ratio of

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[1] There are some difficulties with interpreting this as a pure flow since it is strictly a stock, i.e observed at a single point in time but, given that duration is fixed (i.e. two months) then variations will largely reflect changes in the flow. However, since we are not measuring completed spells, the composition of durations will not, in general, be constant (such that average duration is always one month). Though this will be relatively unimportant (given that the maximum spell is shorter than the period of observation) it may also be that books were drawn back into the system in different proportions at different times.

disallowances to claims, termed Z is included as a level since it represents a flow variable, was entered separately for the four periods distinguished when different disallowance procedures operated.

The result of estimating this equation is given as equation (1) in Table 6.8. Though a reasonable level of explanatory power was achieved several of the terms including the change in unemployment were not significant and the equation exhibits serial correlation. An alternative formulation is to include unemployment as a level rather than a change. This represents the total stock from which those passing through the Two Months file were drawn and was therefore included with a lag of one quarter[1]. As shown in equation (2) this improves the equation considerably and raises the Durbin Watson statistic to an acceptable level. The coefficient on lagged unemployment indicates that the elasticity of the Two Months file to the number unemployed is strikingly high at 0.6. Furthermore the benefit to wage ratio enters significantly with the expected sign, indicating that an increase in the ratio reduced the flow out of insurance. The wage to cost of living ratio, however, now gives the wrong sign and is not significant. The variables for the rate of disallowance subscripted for the different periods also give striking confirmation of the impact of changes in the provisions for and administration of benefit claims. In the first period variations in the rate of disallowance do not seem to have affected the outflow but, subsequently, the effects are strongly positive and increasingly large. An attempt was made to see if these effects were simply arising because the different segments were acting as shift dummies , but the inclusion of dummies for each of the periods did not give any significant coefficients.

[1] This is the appropriate stock since those on the file would have been there for anything up to two months. Also, it does not appear that those passing directly from employment out of insurance would appear since their books would not have been deposited at the exchange.

Table 6.8

Eq. No.	Const.	$\Delta \ln U_t$	$\ln U_{t-1}$	$\Delta \ln(B/W)_t$	$\Delta \ln(W/C)_t$	$\ln Z_t$ (24-28)	$\ln Z_t$ (28-30)	$\ln Z_t$ (30-35)	$\ln Z_t$	$\ln J_t$	$\bar{R}^2$	RSS	D.W
						Dependent Variable ln(TMF) 1924IV - 1939I							
1	4.6249	-0.0719		-2.7246	-1.9259	-0.0199	0.1360	0.1855	1.0885		0.5590	1.0469	0.9918
	(0.0946)	(0.2425)		(0.7447)	(1.7833)	(0.0498)	(0.0437)	(0.2458)	(0.2659)				
2	0.4792		0.5895	-1.4789	0.4418	-0.0146	0.1390	1.2936	1.7003		0.7321	0.6560	1.7321
	(0.8385)		(0.1151)	(0.6854)	(1.5637)	(0.0600)	(0.0494)	(0.3426)	(0.3200)				
						Dependent Variable $\Delta \ln(L)_t$ 1924IV - 1939II							
3	-0.0815	0.0044		0.0043	0.0365	-0.0013	-0.0017	-0.0097	-0.0159	0.0109	0.1831	0.00022	0.8586
	(0.0343)	(0.0037)		(0.0121)	(0.0291)	(0.0011)	(0.0009)	(0.0059)	(0.0063)	(0.0044)			
4	-0.0279		-0.0054	-0.0038	0.0336	-0.0008	-0.0013	-0.0164	-0.0177	0.0090	0.2598	0.00020	0.9812
	(0.0406)		(0.0021)	(0.0121)	(0.0275)	(0.0011)	(0.0009)	(0.0061)	(0.0060)	(0.0043)			

5 $$\Delta \ln L = \underset{(0.6565)}{1.7295} + \underset{(0.0027)}{0.0004}\,\Delta \ln U_t + \underset{(0.0026)}{0.0016}\,\ln U_{t-1} + \underset{(0.0106)}{0.0226}\,\Delta \ln(B/W)_t + \underset{(0.0083)}{0.0480}\,\ln(B/W)_{t-1} + \underset{(0.0238)}{0.0018}\,\Delta \ln(W/C)$$

$$+ \underset{(0.0238)}{0.0008}\,\ln(W/C)_{t-1} + \underset{(0.0083)}{0.0328}\,\ln J_t - \underset{(0.0775)}{0.1901}\,\ln L_{t-1} + \underset{(0.0003)}{0.0006}t - \underset{(0.0008)}{0.0007}\,\ln Z_{t\,(24-28)} - \underset{(0.0007)}{0.0014}\,\ln Z_{t\,(28-30)}$$

$$- \underset{(0.0045)}{0.0132}\,\ln Z_{t\,(30-35)} - \underset{(0.0052)}{0.0123}\,\ln Z_{t\,(35-38)} \qquad \bar{R}^2 = 0.6435,\ \text{RSS} = 0.00009,\ \text{D.W} = 1.5517$$

Thus it appears that insofar as the Two Months file reflects the outflow from insurance, it can be explained using a combination of variables representing economic incentives and the stance of the insurance system. The next step is to attempt to embody this in an explanation of variations in the total number insured. This variable is available on a quarterly basis in the data set referred to compiled in the Gazette. Since direct observations are only available once a year (at the mid year card count) the quarterly figures were interpolations almost certainly obtained by examining the records of new entrants and the Two Months file. Insofar as there are inaccuracies in this estimate, it will also be reflected in the quarterly series for employment which is obtained by deducting the monthly average of unemployed from the labour force estimate.

One additional variable needs to be included to account for the flow into insurance which, at least for new entrants, has a large demographic component. Thus it is necessary to construct a variable representing the cohort of juveniles entering insurance each year. This was done by taking the annual figures for births in England and Wales and Scotland and constructing a two year quarterly moving average. This was then advanced by 17 years and applied to the quarter at the beginning of which it was centred[1]. This is a flow variable (termed J) and is therefore entered as a level rather than a change.

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[1] The data was obtained from Mitchell and Deane (1962) p. 30-31. The method of construction is such that, e.g. for 1932I, it is the average of births for 1914 and 1915 and for 1932II it is 1915 plus the average of 1914 and 1916, etc. This is consistent with the insured labour force series which includes juveniles aged 16 and 17 throughout but excludes those aged 14 and 15 noted earlier. The inclusion of these is likely to have affected the timing of the entry into insurance of juveniles aged 16 and 17.

With the addition of this variable the equation used in the Two Months file was applied to changes in the insured labour force and the results are given as equations (6.3) and (6.4). The number unemployed was tried both as a difference and a lagged level. Though inclusion as a level improves the estimate, only about 25% of the variation is explained and there is serious serial correlation. With this qualification in mind, however, some of the variables, including the disallowance rates show up well with the expected signs which are are the opposite of those for equations (6.1) and (6.2). Given the extent of serial correlation, the lagged levels of all the variables were included except those which represent flows, i.e. the disallowance rates and the demographic term. The F test massively rejects the first differences specification and the full model including lags, is reported as equation (6.5). The most striking coefficients are on the lagged labour force and the benefit to wage ratio. The former indicates rather slow adjustment of only 20% per quarter and the benefits terms indicate strong positive current and lagged effects. On the other hand, the unemployment rate and wage to cost of living ratio have coefficients which are very small and insignificant. It is pleasing to note, however, that the coefficients of the three disallowance rate terms and the demographic variable remain significant.

It would be possible to explore the dynamics of employment and the labour force further and obtain from the coefficients a quarterly model of unemployment. However, given that both variables are to some extent constructed by a form of interpolation, it is more appropriate to move to analysing the unemployment data itself which is observed directly each month. The equations estimated in this section do, however, indicate which variables appear to be important on either side of the labour market. These do not correspond well with the results of our earlier findings:

for employment output and the real wage and for the insured labour force, the stance of the insurance system and the demographic trend appear to dominate. Thus the variables are clearly separated into those affecting labour demand and those affecting supply which is useful in interpreting the coefficients of a quarterly model of unemployment.

6.6 Quarterly Variables in Unemployment 1924-1939

In this section we examine the results of estimating equations which parallel those estimated in the previous section for each side of the labour market separately. The quarterly series provided by the Ministry of Labour are averages of monthly observations and from the beginning of 1926, when the separate categories were first distinguished, total unemployment is divided into the "wholly unemployed" and the "temporarily stopped". Given that these reflect quite different types of unemployment and, in particular, different durations, it is likely that the responses to economic variables will differ as between the two groups. However, there is a major qualification in that casual workers who were unemployed are included with the wholly unemployed group. Apart from these the wholly unemployed also includes a significant proportion of workers with short durations who were changing jobs or moving into or out of the labour force. Thus the difference is not simply of duration but of the degree of attachment to individual employers but, even among the wholly unemployed, the high frequency of returns to previous employment has been noted. The importance of distinguishing the temporarily stopped is that it focuses exclusively on unemployment among those with a definite promise of or agreement for resumption within a finite and relatively short period.

Recent developments in theory emphasise that the employment contract may, in some circumstances, include not only a current wage contract but an implicit agreement as to the continuation of wages, hours and employment which may be expected in the future contingent on the demand conditions facing the firm. Given worker preferences, a lower multiperiod wage can be offered by firms in the presence of a contract which minimises expected costs and which in some states, leads to layoffs rather than

wage reduction. These arrangements depend on the alternative income available to workers when unemployed, the obvious alternative being unemployment insurance benefits. In the simplest case where these are externally financed, the layoffs will take place when the marginal product of workers falls below the value of benefits plus the utility the additional leisure.

The implications for temporary layoffs have been examined by Feldstein (1976) and Baily (1977) among others. In these models, higher unemployment benefits lead to higher average levels of temporary layoffs and larger variations in employment for given variations in demand. Demand conditions are usually summarised by the price facing the competitive firm but if the firm is sales constrained, this enhances fluctuation in employment under the contract. In Baily's model the alternative income facing workers is the combination of benefits and the expected return from job search. The better are job opportunities elsewhere, the greater the value of these alternatives and the more likely are layoffs. However Pissarides (1981) has argued that, if workers have firm specific human capital, the risk of the loss of this capital to the firm is lower the poorer are opportunities of employment elsewhere and, hence, the more likely are layoffs at a time of high unemployment. In this case firms will be more likely to place their workers on the unemployment register than to keep hoarded labour on the payroll.

The relevance to the interwar period of these observations is obvious. The speed of response of unemployment to variations in demand is one of the features which distinguishes the period. If temporary layoffs are found to vary more in response to demand than other types of unemployment, it would suggest a rationale for these findings which is

rather more subtle than the mere observation of labour market excess supply. Little empirical work on temporary layoffs has been done, though Feldstein (1978) finds strong cross sectional evidence of a positive relation between the benefit to wage ratio and temporary layoffs which is stronger in the presence of unionisation. The recent argument of Benjamin and Kochin connecting the OXO system with short term benefit induced unemployment has already been noted. If the link between the temporarily stopped and unemployment benefits can be substantiated, it would support this view and also help explain why, in some employment equations at least, benefits appear to shift employment at given levels of demand.

The specification used for unemployment is the same as that used in the previous section with both supply and demand side variables and the dependent variable is the first difference of the log of the number unemployed (rather than the unemployment rate). Equation (1) of Table 6.9 is for total unemployment. The change in output and the real wage are significant with the expected sign but the benefit to wage ratio and the wage over the cost of living index, though giving the expected signs are not significant. None of the other terms including the lagged dependent variable gives a significant coefficient and all give the wrong sign. Thus the effects of disallowance rates which were distinguished in the supply side equations do not come through in the unemployment equations. An alternative dynamic specification which drops these terms is given as equation (3). A determinate long run solution for unemployment for given values of the independent variables requires that the lagged dependent variable and some of the other lagged terms be non zero but more of these are significant. On the F test a pure first differences specification (including the first five terms only) cannot be rejected against either of equations (1) and (3) or against the most general

Table 6.9

Eq. No.	(1)	(2)		(3)	(4)
Dep. Var.	$\Delta \ln U_t$	$\Delta \ln WU_t$	Dep. Var.	$\Delta \ln U_t$	$\Delta \ln TS_t$
Const.	1.4549	1.1440	Const.	1.0563	3.4198
	(1.0595)	(1.2378)		(2.1369)	(3.0222)
$\Delta \ln Q_t$	-0.7253	-0.3750	$\Delta \ln Q_t$	-0.7736	-1.6715
	(0.0902)	(0.0939)		(0.1011)	(0.1835)
$\Delta \ln(B/W)_t$	0.4013	0.1051	$\Delta \ln(B/W)_t$	0.5800	0.4313
	(0.3226)	(0.3970)		(0.3527)	(0.7160)
$\Delta \ln(W/P)_t$	0.7982	0.7698	$\Delta \ln(W/P)_t$	0.8728	3.4459
	(0.3197)	(0.3482)		(0.3480)	(0.6845)
$\Delta \ln(W/C)_t$	1.2130	1.2120	$\Delta \ln(W/C)_t$	0.8135	2.1610
	(0.8376)	(0.8943)		(1.0542)	(1.9005)
$\ln(\text{DepVar})_{t-1}$	-0.0528	0.1149	$\ln(\text{DepVar})_{t-1}$	-0.0854	-0.6433
	(0.0561)	(0.0619)		(0.0971)	(0.1293)
$\ln J_t$	0.0686	-0.0165	$\ln J_t$	0.1116	0.5880
	(0.1132)	(0.1292)		(0.1261)	(0.2806)
$\ln Z_t$ (24-28)	0.0467	0.0675	$\ln Q_{t-1}$	-0.1418	-1.0036
	(0.0276)	(0.0302)		(0.1127)	(0.2335)
$\ln Z_t$ (28-30)	0.0172	0.0371	$\ln(B/W)_{t-1}$	0.2026	-0.8186
	(0.0233)	(0.0746)		(0.2730)	(0.4918)
$\ln Z_t$ (30-35)	0.0736	0.0455	$\ln(W/P)_{t-1}$	0.2944	1.0277
	(0.1640)	(0.1775)		(0.2758)	(0.7011)
$\ln Z_t$ (35-39)	0.1436	0.2297	$\ln(W/C)_{t-1}$	-0.6005	0.1738
	(0.1585)	(0.1704)		(1.2035)	(2.0966)
$\bar{R}^2$	0.6880	0.7220	t	0.0015	-0.0010
RSS	0.1261	0.1203		(0.0024)	(0.0045)
D.W.	1.8392	1.8988	$\bar{R}^2$	0.6663	0.8314
			RSS	0.1319	0.3607
			D.W.	1.7248	2.3755

Note: Equations (1) and (3) are estimated for 1924II to 1939II and equations (2) and (4) for 1926II to 1939II.

model including all of the variables in the equations[1].

Equation (2) is for the wholly unemployed and may be compared with that for total unemployment (though it should be noted that sample period is different). The wage and price terms give similar coefficients but that on output falls sharply and the lagged unemployment coefficient is now larger and just significant. It might have been expected that the disallowance variables would enter more strongly for the wholly unemployed but they are still positive and with slightly higher significance levels so the puzzle remains. The test for the joint significance of those terms fails as does that for a dynamic specification against pure first differences.

In equation (4) the model is estimated for the temporarily stopped using the dynamic specification. As would be predicted, the short run elasticity to changes in output and the real wage are larger. about twice the size as compared with those for total unemployment. Furthermore, lagged terms in the temporarily stopped, output and the benefit to wage ratio are significant. It is interesting to note that, given the coefficient on the lagged dependent variable and the negative sign on lagged (B/W) the long run effect of the benefit to wage ratio is negative. Thus there seems to be no support in time series that the benefit to wage ratio is positively related to the numbers temporarily stopped. A further surprising feature is that the demographic variable now takes a significant and positive sign which is not present in the comparable equation for the wholly unemployed. This is surprising, given that juveniles formed such a small proportion of the temporarily stopped at any time.

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[1] The computed F statistics are respectively $F_{6,45} = 1.269$, $F_{7,44} = 0.739$, $F_{11,40} = 1.794$, none of which are significant at the 5% level.

These observations suggest that it may be useful to disaggregate into different groups by age and sex. Data for the wholly unemployed and temporarily stopped distinguishing adult males and females and juvenile boys and girls are not available in the quarterly series provided by the Ministry of Labour. These therefore had to be taken from individual monthly issues of the Gazette and aggregated into quarterly series. The averages of these figures for 1926II to 1939II are as follows (in thousands):

	Men	Women	Boys	Girls
Wholly Unemployed	1123.38	185.69	41.72	37.36
Temporarily Stopped	241.82	100.82	6.56	5.85

These figures (which for the wholly unemployed now exclude casuals) show the surprisingly large number of women who were temporarily stopped - a feature which seems to be related to the industries in which they worked.

The equations for adult men and women appear in Table 6.10. The equation for the wholly unemployed are consistent with those for the aggregate in that changes in output and the real wage are most significant among the economic variables. However, among women, the joint significance of the disallowance terms can be rejected but for men it cannot[1]. The performance of the disallowance terms suggests an interpretation of the previous results. Among men they are all positive and significant while, among women, three are negative and none significant. Thus the effects of disallowances on the insured labour force previously found may have been due largely to the effects on women. For men on the other

[1] The relevant F statistics are: for women $F_{4,39} = 2.297$ and for men $F_{4,39} = 3.847$.

Table 6.10

	Wholly Unemployed			Temporarily Stopped	
Eq. No.	(1)	(2)		(3)	(4)
Group (i)	Men	Women	Group (i)	Men	Women
Const.	0.8281 (0.2801)	1.0499 (0.3494)	Const	7.0164 (2.2296)	2.7671 (2.6771)
$\Delta \ln Q_t$	-0.4056 (0.0770)	-0.4759 (0.1732)	$\Delta \ln Q_t$	-1.5383 (0.2202)	-2.2076 (0.2716)
$\Delta \ln(B_i/W)_t$	-0.2600 (0.3180)	0.3211 (0.6954)	$\Delta \ln(B_i/W)_t$	-0.4915 (0.8470)	0.6070 (0.9301)
$\Delta \ln(W/P)_t$	0.8083 (0.2892)	1.4651 (0.6589)	$\Delta \ln(W/P)_t$	3.8720 (0.8335)	3.9308 (0.9656)
$\Delta \ln(W/L)_t$	0.0505 (0.7406)	2.4846 (1.6405)	$\Delta \ln(W/L)_t$	2.0462 (2.3249)	0.5482 (2.7523)
$\ln WU_{it-1}$	-0.0891 (0.0403)	-0.1879 (0.0746)	$\ln TS_{it-1}$	-0.7424 (0.1351)	-0.5468 (0.1083)
$\ln Z_{it}$ (25-28)	0.0636 (0.0199)	0.0376 (0.0844)	$\ln Q_{t-1}$	-0.9240 (0.2403)	-0.8347 (0.3114)
$\ln Z_{it}$ (28-36)	0.0371 (0.0144)	-0.0677 (0.0580)	$\ln(B_i/W)_{t-1}$	-0.8911 (0.5717)	0.7178 (0.6538)
$\ln Z_{it}$ (30-35)	0.0996 (0.0894)	-0.4725 (0.3636)	$\ln(W/P)_{t-1}$	1.3854 (0.8186)	1.1287 (0.9295)
$\ln Z_{it}$ (35-39)	0.2353 (0.0848)	-0.4588 (0.3426)	$\ln(W/C)_{t-1}$	0.3223 (2.4736)	-3.7350 (3.0799)
$\bar{R}^2$	0.7682	0.6051	t	-0.0065	0.0107
RSS	0.0877	0.4449		(0.0054)	(0.0065)
D.W.	1.8865	2.0659	$\bar{R}^2$	0.7630	0.7202
			RSS	0.5709	0.7953
			D.W.	2.5950	2.2961

hand it is possible that high disallowance rates were more a result of high unemployment[1]. The results for the temporarily stopped also resemble closely the aggregate results with large significant coefficients on output and the real wage and significant negative coefficients on lagged output and the lagged dependent variable. The lagged benefit to wage ratio gives negative signs though these are not significant.

We turn finally to the similar equations for juveniles. This raises a problem for the disallowance variables since juveniles were not separately distinguished before 1930 and even after this not by sex. An effort was made to include the variable using dummies for the two regimes before 1930. This yielded some significant coefficients but, unlike the equations for adult males and females, the dynamic terms could not be rejected[2].

The equations given for the wholly unemployed, therefore, include the lagged independent variables and nearly every variable enters with an individually significant coefficient. Of particular interest are the coefficients on the benefit to wage ratio which are significant and positive in both the current change and the lagged level. The long run

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[1] Beveridge found that the total number of disallowances increased as unemployment fell and ascribed this to the larger proportion of claims formed by those of "unsteady character" (1944, p. 197). This figure, however, excludes those found ineligible for benefits on grounds other than misconduct, voluntary quit or refusal to accept suitable employment.

[2] The restrictions tested were as follows: (1) for the disallowance terms in absence of the lagged independent variables, (2) for the lagged independent variables in the absence of the disallowance terms (3) for the disallowance variables in the presence of the lagged independent variables and (4) for the lagged independent variables in the presence of the disallowance terms. Significance at the 5% level is denoted by the asterisk

Restriction	(1) $F_{4,39}$	(2) $F_{5,38}$	(3) $F_{4,34}$	(4) $F_{5,34}$
Boys	3.573*	3,278*	1.746	1.719
Girls	2.669*	3.394*	1.786	2.488*

elasticities implied are strikingly high, for boys 3.65 and for girls 3.37. It is possible that lack of wage series for juveniles and the consequent use of the aggregate wage index leads to spurious results but the size and significance of the coefficients suggests that they cannot be easily dismissed. The long run coefficients on the other variables are consistent with expectation with the exception of the wage relative to cost of living which is negative. The other curious finding is that the demographic variables give significant negative coefficients about which further comment will be made.

In the equations for the temporarily stopped, the usual results for the output, the real wage and the lagged dependents variable appear but there are striking contrasts in other respects. In particular the benefit coefficients are strongly negative which suggests that in parts, the effects of the benefit to wage ratio were to shift juveniles out of the temporarily stopped and into the wholly unemployed. However, the net effect of a rise in benefits (evaluated at the sample means) is to raise the wholly unemployed by nearly four times the fall in the temporarily stopped. Finally, the effect of the demographic variable is now positive though it is not sufficiently large to offset the negative coefficients for the wholly unemployed.

These results for quarterly data are curious and conflicting and the reasons for them are not obvious. The results obtained indicate that a quarterly model for interwar unemployment can be estimated with some precision using available data. However further work on the dynamic structure and, perhaps, the variables used in the model is needed before clear conclusions can be reached.

Table 6.11

	Wholly Unemployed			Temporarily Stopped	
Group (i)	Boys	Girls	Group(i)	Boys	Girls
Const.	8.2671 (2.6817)	5.7538 (1.7953)	Const.	-14.0194 (9.2767)	-13.4374 (10.3128)
$\Delta \ln Q_t$	-0.5228 (0.1018)	-0.4144 (0.0896)	$\Delta \ln Q_t$	-2.1503 (0.3553)	-2.6448 (0.3848)
$\Delta \ln(B_i/W)_t$	1.1400 (0.5067)	1.0309 (0.3651)	$\Delta \ln(B_i/W)_t$	-4.5775 (2.1936)	-3.0961 (2.3360)
$\Delta \ln(W/P)_t$	1.4906 (0.3428)	1.0346 (0.2931)	$\Delta \ln(W/P)_t$	4.7728 (1.2448)	4.8085 (1.2607)
$\Delta \ln(W/C)_t$	-0.2449 (0.1136)	0.3030 (0.9560)	$\Delta \ln(W/C)_t$	6.4089 (3.6609)	1.6208 (3.6499)
$\ln(WU_i)_{t-1}$	-0.4600 (0.1238)	-0.3975 (0.1093)	$\ln(TS_i)_{t-1}$	-0.7514 (0.1583)	-0.6046 (0.1406)
$\ln J_{it}$	-1.5259 (0.5230)	-0.9593 (0.3530)	$\ln J_{it}$	4.5676 (2.1367)	3.8470 (2.3900)
$\ln Q_{t-1}$	-0.1680 (0.1015)	-0.1184 (0.0815)	$\ln Q_{t-1}$	-0.9267 (0.3673)	-1.0794 (0.4247)
$\ln(B_i/W)_{t-1}$	1.6783 (0.5429)	1.3375 (0.3883)	$\ln(B_i/W)_{t-1}$	-4.6930 (2.2510)	-3.6706 (2.4143)
$\ln(W/P)_{t-1}$	1.2665 (0.4566)	0.7415 (0.3622)	$\ln(W/P)_{t-1}$	1.7165 (1.3548)	1.2452 (1.3156)
$\ln(W/C)_{t-1}$	-2.2911 (1.2389)	-2.5756 (1.0995)	$\ln(W/C)_{t-1}$	2.9603 (3.8800)	-3.8714 (3.9670)
t	0.0069 (0.0034)	0.0092 (0.0030	t	-0.0224 (0.0115)	0.0080 (0.0101)
$\bar{R}^2$	0.8728	0.9135	$\bar{R}^2$	0.7492	0.6943
RSS	0.1115	0.0862	RSS	1.3586	1.4228
D.W.	2.0803	1.8857	D.W.	2.1045	2.0499

APPENDIX 6A.1

Sources and Methods of Calculation of Price Series for Industries, 1920-38

In order to produce the estimates of employment demand by industry in Sections 6.2 and 6.3, a product price index for each separate industrial sector was required. No detailed series on prices for sectors deferred by the Standard Industrial Classification of 1948 are available. The price series used were crudely constructed from readily available sources and it is hoped that however defective the resulting estimates are, they approximate the year to year fluctuations in prices by sector somewhat better than using the aggregate price index.

Price indices for Drink, Tobacco and Gas and Water were taken from Stone and Rowe (1953), Table 73, p. 190, Table 71, p. 195 and Table 94, p. 211 respectively and Building Materials from Maywald (1954) p. 193. Series for Ferrous Metals, Non Ferrous Metals, Textiles, Chemicals and Coal were obtained from Mitchell and Deane (1962) p. 477 and spliced at 1930. The index for "Other Articles" continued from 1930 as "Miscellaneous" was used for Leather, Paper and Printing and Timber and Furniture. The remaining series were obtained from Feinstein (1972); Shipbuilding and Vehicles from Table 63, p. T137, Food and Clothing from Table 62, p. T132 and, for Miscellaneous goods, an index was derived from rows 8-10, Tables 24 and 25, p. T62-3 and T166-7. Separate indices could not be derived for each division of engineering so Feinstein's (1965) "Unspecified Plant and Machinery" index was used for Mechanical Engineering, Electrical Engineering and Precision Instruments.

CHAPTER 7

STRUCTURAL ASPECTS OF UNEMPLOYMENT BETWEEN THE WARS

7.1 Unemployment by Industry and Region

The broad dimensions of the pattern of interwar unemployment was discussed in Chapter 4. In this chapter, the focus is on the variation in unemployment rates across industries and regions, the major features of which may be briefly restated. Taking the average over the years 1923 - 1938, industrial unemployment rates ranged from a little over four per cent in groups such as Business and Financial Services and Other Road Transport up to nearly thirty-eight per cent for Shipbuilding. Similarly, over the nine regions distinguished by the Ministry of Labour, average rates varied over the same years from close to eight per cent for London and the South East to around twenty-two per cent for the most hard hit regions of Wales and Northern Ireland. There is a clear ordering of regional unemployment rates which persists over time, with the South, including the Midlands (which is intermediate in some respects) having unemployment rates on average half of those in the northern half of the country. It was largely this distinction which gave rise to the notion of "Two Britains" often labelled "Inner Britain" and the "Outer Regions"[1].

For many writers who have examined the regional incidence of unemployment, this imbalance, which appears to have been the reverse of that existing before 1914[2] was almost entirely due to the contraction of the

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[1] The geographical separation of the two regions used in this chapter follows that used by the Ministry of Labour, the four southern divisions London, South East, South West and Midlands, comprise Inner Britain, while the remaining five, North East, North West, Scotland, Wales and Northern Ireland make up the Outer Regions.

[2] See Beveridge (1944) pp. 73-74 for a comparision with the prewar distribution.

major ninteenth century staple industries of Textiles, Coal, Iron and Steel and Shipbuilding, to which perhaps, Engineering should be added. Thus, in their recent paper, Booth and Glynn argued that "high regional unemployment differentials arose because of the geographical concentration of these ailing industries, the location and establishment of growth industries elsewhere and the immobility of the industrial workforce" . (1975, p. 618).

This view was in varying degrees taken by contemporary writers such as Beveridge and Clay and is the most commonly found textbook explanation of regional variations[1]. Virtually the only formal attempt to examine the relationship between the industrial and regional characteristics of unemployment appeared in two articles written by Champernowne just before the outbreak of war . His conclusions were stated in these terms: "It seems that the main cause of the variation of unemployment percentage between industries is not so much that the percentages vary between industries within Inner Britain or within the outer Regions, as that some industries are mainly situated in prosperous Inner Britain and others are mainly situated in the depressed Outer regions" (1938, p. 103).

Champernowne worked with data provided by the Ministry of Labour for 100 industries for these two regions at the mid-year of 1929, 1932 and 1936. The conclusion stated above, however, was drawn primarily from examining a random sample of sixteen of the industries for which hypothetical unemployment percentages were computed by taking the region wide unemployment rates for Inner Britain and the Outer Regions weighted by the share of the industry's labour force in each region. These were then compared with the actual national unemployment rates for these industries in the

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[1] Clay (1929) p. 45, Beveridge 1930, p. 355. Two wellknown texts which embody this approach are Aldcroft (1970), Ch. 3 and Glynn and Oxborrow (1976), Chs. 3, 5.

year of observation, 1936 (1938, p. 102). However, when challenged to further substantiate the arguments that most of the variation between national unemployment rates by industry could be accounted for in this manner, Champernowne retracted the statement, conceding that the sample was unrepresentative. He admitted that location could only account for a small proportion of the differences in rates and that simple statistical techniques could not isolate geographical from industrial mobility[1].

The basic idea lying behind such comparisons is that, if in a region, there were perfect mobility of workers between industries but not between that region and another, then for each industry in the region, the unemployment would be approximately equal but different from the rate typical in the other region. On the other hand, if workers were mobile geographically but not industrially, the rate of unemployment in an industry would tend towards equality between different regions but not between industries in a region and the differences in regional unemployment rates would merely reflect the shares of various industries across regions. This gives a crude distinction between the extremes of structural unemployment which might be characterised as regional and industrial[2].

It is often not sufficiently stressed that this distinction does not necessarily bear a close relationship to the original cause of regional and industrial differences. For instance, if an industry concentrated in a particular region suddenly collapsed, workers in that industry might become evenly distributed over other industries in the region and hence the imbalance would appear as regional rather than industrial. However, the fact of redistribution or lack of it, reflects the specificity of

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1 Champernowne (1939b) p. 215. The objection was raised by ..Singer though the conclusion was also criticised by Dennison (1938) p. 158.

2 It should be noted at this stage that the term "structural unemployment is used only to refer to the fact of regional or industrial differences and not as a theoretical construct.

labour, whether in terms of skills, other objective characteristics or subjective attitudes[1]. It is this which is relevant if structural unemployment is considered from the point of view of solutions rather than causes. A severe regional imbalance might be tackled with appropriate regional policies while an industrial imbalance would require a policy framed towards stimulating particular industries or sectors of the economy. Thus one might consistently hold, as Booth and Glyn appear to, that the decline of particular industries was the cause but that "the interwar unemployment problem was essentially regional", (1975, p. 611).

In his original article Champernowne pointed out that in 1936, with only one exception (tailoring) the industrial unemployment percentage was greater in the Outer Regions than in Inner Britain, suggesting in the sense just defined, that unemployment was, to a certain extent, regional. In his "correction", however, he pointed out that there was a "fairly marked correlation" among industries between the unemployment percentage in the two major regions suggesting that immobility between industries was an important feature (1938, p. 103, 1939b, p. 126).

The same data used by Champernowne is given in the statistical tables produced by Beck and this can be used to throw some further light on the issue (1952, Table 21). The original source is from unpublished tables compiled by the Ministry of Labour and it should be remembered that the data covers only insured occupations which account for about sixty per cent of the labour force in 1936.

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[1] Allocating the unemployed to an industry is always somewhat arbitrary and there appears to have been an awareness of this problem in the Ministry of Labour at quite an early stage, see Hilton (1923) p. 175. The unemployed worker was normally allocated to the industry in which he was last employed unless it was known to be temporary or short term employment outside his normal industry.

In the upper half of Table 7.1, the actual unemployment percentages are given for the whole country (UK), Inner Britain (IB) and the Outer Regions (OR) as calculated in the usual way. The absolute difference between the two major regions, which widens after 1929 to nearly double its previous

Table 7.1

Actual Unemployment Rates (mid-year)

	UK	IB	OR	OR-IB
1929	9.66	6.30	12.87	6.57
1932	22.39	15.98	28.47	12.49
1936	12.95	7.27	18.80	11.53

Average Unemployment Rates (100 industries equally weighted)

	UK	IB[1]	OR	OR-IB
1929	8.83	6.85	10.94	4.09
1932	22.70	18.31	26.52	8.21
1936	11.75	7.77	16.16	8.39

level is given in the final column. If this difference were due largely to immobility between industries with high unemployment being located predominantly in the outer regions, then this difference should decline substantially if all industries are weighted equally in each region. The results of these calculations are provided in the lower half of the table and these show that about two thirds of the differences remains with a slight tendency for the proportion to increase over time. Thus, on average, unemployment percentages in industries were higher in the Outer Regions by four percentage points in 1929 and by over eight percentage points in

[1] This column gives an average over ninety-nine industries since one industry (jute) is not represented at all in Inner Britain.

the early 1930s. It is also interesting to note that the averages computed for the U.K in this manner do not differ very much from those in the top half of the table which reflects the fineness of the industrial classification[1].

These findings tend to support Champernowne's original view though not quite in the way he expressed it. A formal representation of the relationship he specified for his sixteen industry sample is given by the following equation

$$U_{Ni} = \alpha_o + \alpha_1 S_{ORi} \qquad (7.1)$$

where U_{Ni} is the national unemployment percentage in industry i and S_{ORi} is the share of the insured labour force of industry i which is located in the Outer Regions. If the national unemployment percentage for the industry were merely a function of the proportion of the industry's labour force in the high unemployment region, then equation (1) would give α_o equal to the unemployment percentage in Inner Britain and α_1 to the difference in the percentage between the two regions. Thus, in 1936, the year examined by Champernowne, the hypothesis would be $\alpha_o = 7.3$ and $\alpha_1 = 11.5$. Using the one hundred industries as units of observation and allowing a stochastic error term, equation (7.1) was estimated by ordinary least squares and the results for the three years are given in Table 7.2.

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[1] Thus, for instance, the textile group contains eleven different industries on this classification and, hence, when each is weighted equally, the group, as a whole, maintains more than a ten per cent share in the total.

Table 7.2

Year	Const.	S_{OR}	$\bar{R}^2$
1929	4.18	9.63	0.18
	(1.08)	(2.03)	
1932	10.76	24.68	0.20
	(2.61)	(4.91)	
1936	4.59	15.15	0.24
	(1.39)	(2.66)	

(Standard errors are given in parentheses).

The results are of some interest and again they tend to support Champernowne's contention although they do not bear it out exactly. The coefficients are all highly significant and suggest a strong relationship between the share of the labour force in the Outer Regions and the overall unemployment percentage though it should be noted that only about a fifth of the variance is explained. The equation for 1936 suggests that an industry located entirely in Inner Britain would have a predicted unemployment rate of 4.6 per cent compared with the actual of 12.9 and in the Outer Regions of 19.7 compared with the actual of 16.6. The actual and predicted figures are some what closer for 1929 than for the two subsequent years but, in each case, the coefficient estimate is significantly different from that implied by the null hypothesis. The result is always for α_o to be smaller and α_1 larger, suggesting that industries located mainly in the Outer Regions tended to have higher unemployment rates and those located mainly in Inner Britain lower rates than the regional averages suggest.

We now turn to the other relationship mentioned, namely that between the unemployment percentage in the two regions for each industry. This is specified in the following equation

$$U_{ORi} = \beta_o + \beta_1 U_{IBi} \qquad (7.2)$$

In this case, if there were pure industrial immobility, we would expect $\beta_o = 0$, $\beta_1 = 1$ predicting identical rates in the industry in both regions. This polar case has already been rejected in Table I but it is of interest to measure the two parameters separately, The results of estimating equation (7.2) across ninety-nine industries are given in Table 7.3.

Table 7.3

Year	Const.	U_{IB}	$\bar{R}^2$
1929	4.43	0.95	0.53
	(0.73)	(0.09)	
1932	8.66	0.96	0.58
	(1.72)	(0.08)	
1936	6.50	1.23	0.50
	(1.13)	(0.12)	

(Standard errors in parentheses)

All the coefficients are highly significant and about half of the variation is explained in each case. In each equation the constant term β_o is quite close to the difference in unweighted unemployment rates in Table I which is equivalent to the average differential and the coefficient β_1 is close to one. 1936 is slightly different with β_o lower and β_1 significantly larger than one by a small margin. Thus there is a highly significant differential between industrial unemployment percentages in the two regions. This alone would tend to yield higher unemployment percentages in industries

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[1] The jute industry was omitted since it was not represented in Inner Britain.

located primarily in the Outer Regions. Above this, however, a one percentage point increase in an industry's unemployment rate in Inner Britain is closely associated with a similar rise in the Outer regions. These results clearly reject the pure industrial unemployment hypothesis as expected and suggest that Champernowne need not have conceded his point quite so easily. But in order to get some idea of the relative importance of the regional and industrial components of unemployment, we need to measure each separately and compare the relative magnitudes.

A method frequently used for this purpose is "shift-share" or standardisation analysis. The unemployment rate for a particular region can be written as the weighted sum of industrial unemployment rates in the region, $U_r = \sum_i W_{ri} U_{ri}$ where W_{ri} is the proportion of the region's labour force in industry i and U_{ri} is the unemployment rate of industry i in the region (r). Similarly the national unemployment percentage can be written as $U_n = \sum_i W_{ni} U_{ni}$ where subscripts n denote national magnitudes. The "composition constant" rate of unemployment for the region can be calculated by applying national weights to regional unemployment percentages to give $U^*_r = \sum_i W_{ni} U_{ri}$. Thus $U_r - U^*_r$ measures the industrial composition component of the differential between the regional and national unemployment rate. Similarly, the "rate constant" unemployment rate for the region is calculated by applying the national industry unemployment percentages to regional labour force weights to give $U^{**}_r = \sum_i W_{ri} U_{ni}$. This gives the "regional rate" component of the difference between the regional and national unemployment as $U_r - U^{**}_r$.

These two terms do not sum to the difference between the regional and national unemployment rates since there is a residual interaction term as can be seen when the expression for the entire difference between the two is written as follows:

$$U_r - U_n = \sum_i U_{ri}(W_{ri} - W_{ni}) + \sum W_{ri}(U_{ri} - U_{ni})$$

$$- \sum(W_{ri} - W_{ni})(U_{ri} - U_{ni}) \qquad (7.3)$$

$$= (U_r - U_r^*) + (U_r - U_r^{**}) + \sum(W_{ri} - W_{ni})(U_{ri} - U_{ni}) \qquad (7.4)$$

The third term will be negative if there is a positive correlation between weight and rate differences. There are a variety of other ways of decomposing the total difference, some of which eliminate the interaction term but provide a less satisfactory basis for comparison[1].

The industrial composition and regional rate components given in equation (4) were first calculated for the data set previously examined for one hundred industries in Inner Britain and the Outer Regions and the results are given in Table 7.4.

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[1] The decomposition given by (7.3) and (7.4) is one of those discussed by Dixon and Thirwall who give four other alternatives which are as follows:

a) $U_r - U_n = \sum_i U_{ni}(W_{ri} - W_{ni}) + \sum_i W_{ni}(U_{ri} - U_{ni}) + \sum_i (W_{ni} - W_{ri})(U_{ni} - U_{ri})$

b) $U_r - U_n = \sum_i U_{ri}(W_{ri} - W_{ni}) + \sum_i W_{ni}(U_{ri} - U_{ni})$

c) $U_r - U_n = \sum_i U_{ni}(W_{ri} - W_{ni}) + \sum_i W_{ri}(U_{ri} - U_{ni})$

d) $U_r - U_n = \sum_i \frac{1}{2}(U_{ri} + U_{ni})(W_{ri} - W_{ni}) + \sum_i \frac{1}{2}(W_{ri} + W_{ni})(U_{ri} - U_{ni})$

There are no theoretical reasons for preferring any one of these over that given in equation (7.3). Its closest relative is (a) but this yields the terms $U_n - U_r^*$ and $U_n - U_r^{**}$ which are not the straightforward composition and rate components but the complements of them which makes interpretation slightly more difficult. Equations b and c have the advantage of eliminating the interaction term but have an assymetry since one term standardised by the region and the other by the aggregate. Equation (d) takes averages but is more difficult to interpret and calculate. For further discussion of these measures, see Dixon and Thirwall (1975) p.8-11.

Table 7.4

Shift-Share Analysis for Unemployment in Two Major Regions

	1929 (U_n = 9.66)			1932 (U_n = 22.39)			1936 (U_n = 12.95)		
	$U_r - U_n$	$U_r - U_r^*$	$U_r - U_r^{**}$	$U_r - U_n$	$U_r - U_r^*$	$U_r - U_r^{**}$	$U_r - U_n$	$U_r - U_r^*$	$U_r - U_r^{**}$
Inner Britain	-3.36	-1.37	-1.88	-6.41	-1.85	-3.38	-5.68	-1.07	-3.89
Outer Britain	+3.21	+1.09	+1.73	+6.08	+2.69	+3.21	+5.85	+1.45	+4.01

These calculations show that in each case the industrial composition component is smaller than the regional rate component. This suggests that differences between unemployment rates in the same industry accounted for more of the observed unemployment differential between regions than differences in the industrial composition of regions. There is also some evidence that this effect increased with time as might have been expected if mobility of labour within regions tended over time to reduce differences between industries. But it is surprising that this happens between 1929 and 1932 when the depression in particular industries was most intense. It can also be seen that the interaction term is negative for Inner Britain and positive for the outer Regions which is consistent with the findings of the previous section[1].

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[1] This arises from the results of Table III which suggest a roughly constant differential across industries between unemployment rates in the two regions. Thus, for example, the larger the share of the labour force in the Outer Regions the greater will be $W_{ri} - W_{ni}$ and the closer will the regional unemployment rate U_{ri} be to the national rate U_{ni}. Hence U_{ri} falls relative to U_{ni} giving a negative correlation and, since the sign on the interaction term is negative, the outcome is positive. For Inner Britain the sign will be reversed since the larger the weight of Inner Britain relative to the aggregate, the higher is U_{ri} relative to U_{ni}.

The analysis can be taken further to examine regional and industrial components of unemployment differences for the nine individual Ministry of Labour Divisions for which data on numbers employed and unemployed by industry is again provided by Beck (1952, Tables 14 and 22). In this case the number of industries is reduced to thirty. These are not based on a broader classification of industries, however, but are the largest of the individual industries accounting, in aggregate, for nearly three quarters of the labour force of the hundred industries. Since there is a possibility that this might lead to some bias in the results, the analysis was also done for the two major regions on the thirty industries for comparison. There is some reason to believe, however, that the results will not be too misleading since the overall unemployment percentages calculated for the smaller number of industries do not differ very much from those for the full complement of industries[1]. The results given in Table 7.5 show, however, that for the two major regions the dominance of the regional rate component is less marked. For the two earlier years Inner Britain benefitted from and the Outer Regions suffered from composition and rate differences in roughly equal amounts though, by 1936, industrial composition was a far less important factor in the unemployment differential. In 1929 the industrial distribution provided an advantage to the South West but a substantial disadvantage to the North East, Wales and Northern Ireland and, to some extent, the Midlands. For London and the South East differences in rates are very dominant and this also benefitted the South West but severely disadvantaged the North West, Wales and Northern Ireland. The pattern is not

[1] The figures comparable with those of the top panel of Table 7.1 are as follows:

Unemployment Rates (30 Industries)

	UK	IB	OR	OR - IB
1929	8.83	5.93	12.88	6.95
1932	20.99	15.38	28.56	13.18
1936	11.68	6.87	17.90	11.03

Table 7.5

Shift-Share Analysis for Unemployment Percentages for Ministry of Labour Divisions by 30 Industries

	1929 (U_n = 8.83)			1932 (U_n = 20.99)			1936 (U_n = 11.68)		
	U_r-U_n	$U_r-U^*_r$	$U_r-U^{**}_r$	U_r-U_n	$U_r-U^*_r$	$U_r-U^{**}_r$	U_r-U_n	$U_r-U^*_r$	$U_r-U^{**}_r$
London	-4.15	+0.03	-2.09	-8.40	-0.89	-2.84	-5.42	-0.26	-3.03
South East	-5.56	+0.03	-3.87	-9.01	+1.17	-6.02	-6.65	-0.61	-4.89
South West	-2.80	-1.63	-1.96	-6.18	-2.10	-4.58	-4.57	-1.79	-3.81
Midlands	+0.66	+1.09	-0.20	+0.20	+3.13	-1.59	-3.10	+0.49	-3.48
North East	+3.72	+1.74	+0.27	+8.80	+5.09	+2.45	+5.79	+2.61	+2.42
North West	+3.93	-0.14	+2.34	+5.80	+1.55	+2.64	+4.73	+0.17	+3.36
Scotland	+2.02	+0.65	+0.69	+4.92	+2.53	+2.35	+4.12	+0.58	+2.51
Wales	+9.28	+5.3	+3.55	+16.31	+10.89	+5.92	+17.30	+8.13	+9.39
Northern Ireland	+4.83	+4.20	+4.84	+4.91	+8.21	+5.01	+7.90	+4.3	+7.72
Inner Britain	-2.90	-1.72	-1.76	-5.61	-2.17	-3.22	-4.81	-1.07	-3.56
Outer Regions	+4.05	+1.40	+1.54	+7.57	+3.21	+2.89	+6.22	+1.56	+3.57

very different for 1932 though as unemployment differentials increase, there is a tendency for both components to grow. Even during the sharp rise in unemployment with divergent rates of contraction among industries, it appears that only in the Midlands, Northwest, Wales and Northern Ireland is industrial composition the dominant factor. By 1936 only in the North East is the industrial composition component equal in importance with regional rate divergence. In all regions with the exception of Wales and Northern Ireland compositon effects are relatively small.

These results at the divisional level are consistent with the rise in the regional rate differential noted in the previous section and suggest that especially for 1936 this applies quite widely across divisions. The interaction terms generally take the same sign as the observed differential as expected and are sometimes quite large. In part, this may be due to the methods used in calculating the composition constant unemployment rate since where the regional weight is zero, there is no regional unemployment rate and hence the national rate was used. This may account in part for the very large residual for Northern Ireland and the conclusions stated above must be subject to this qualification.

7.2 Employment Growth by Industry and Region

In most accounts of the interwar labour market, the major cause of persistent regional disparities in unemployment rates is found in the differential rates of growth of employment across different regions. For the 100 industries employment fell to 96 per cent of its 1929 level in 1932 in Inner Britain but to 86 per cent in the Outer Regions. By 1936 employment in Inner Britain was 15 per cent above that in 1929 while in the Outer Regions it was still 2 per cent below. For 30 industries, at the the extremes, employment grew by a quarter between 1929 and 1936 in the South East while it fell by 16 per cent in Wales.

Some writers have seen relative rates of growth among regions as simply a reflection of their industrial structure. For instance, according to Fogarty, "There was a tendency before the war for employment to increase or diminish in each area at about the rate which might have been expected if each industry had grown or contracted at the same rate all over the country (1945, p. 7). In his memorandum to the Barlow Commission, Jones came to a similar conclusion about the changes in the insured population which took place between 1923 and 1937. Though some differences emerged between the expansion of different groups of industries in different areas, the regional industrial structure appeared to be the most important determinant of a region's fortunes (Barlow Commission Report, 1940, pp. 277-9). The apparent exception to this was the area of Mid Scotland whose employment growth over the same period was investigated by Laser and Silvey. Using shift-share analysis they found that if all industries in mid Scotland had expanded at the national rate, total employment would have expanded by 3.7 per cent, instead of which it declined to 3.9 per cent (1950, p. 166). Richardson argued more generally that the regional pattern of recovery in the 1930's was "not full explicable in terms of industrial composition".

Comparing the experience of Scotland with Great Britain as a whole, he found that the slump after 1929 was more intense primarily because of the Scottish industrial structure but that "the dominant factor in recovery was the benefits of induced recovery spilling over into Scottish industry, particularly heavy industries, from the broad wave of recovery in the United Kingdom as a whole (1967, pp. 290-1).

Champernowne, in his analysis, computed the employment change which would have occurred in Inner Britain and the Outer Regions if, in nine major industries and the remaining aggregate of 'All Other Industries', between 1929 and 1936, employment had grown at the national rate. The result indicated "a tendency for industries to grow more slowly in the Outer Regions than in Inner Britain, thus exacerbating the regional imbalance (1939, p. 98). However, nearly half of the slower growth of the former arose from the slower growth of the 'All Other Industries' group in which compositional effects were not taken into account.

It is a natural step to shed further light on these issues by conducting shift-share analysis with employment growth. One plus the growth rate of employment in a region can be written as $(1 + g_r) = \sum_i E_{ri,t} / \sum_i E_{ri,s}$ where E_{ri} is employment in industry i in region r, s is the base year and t the terminal year, giving the interval t - s. Similarly for the economy as a whole $(1 + g_n) = \sum_i E_{ni,t} / \sum E_{ni,s}$. As before the "composition constant" rate of growth for the region plus one can be calculated by applying the national base year weights to one plus the regional growth rates to give $(1+g^*_r) = \Sigma P_{ni,s}(1+g_{ri})$ where the base year national employment weights are defined as $P_{ni,s} = E_{ni,s} / \sum_i E_{ni,s}$. The industrial composition component of the difference between regional and national employment growth is $(1+g_r) - (1+g^*_r) = g_r - g^*_r$. Similarly the "rate constant" rate of growth (plus one) is obtained by applying

national employment growth rates (plus one) to the regional base year employment weights to give $(1 + g_r^{**}) = \sum_i (1 + g_{ni}) P_{ri,s}$. The "regional rate" component of the growth differential is $(1+g_r) - (1+g_r^{**}) = g_r - g_r^{**}$.

This decomposition of the growth difference raises exactly the same problems as those encountered with the unemployment percentages and the expression for the total difference is:

$$g_r - g_n = \sum_i (1+g_{ri})(P_{ri} - P_{ni}) + \sum_i P_{ri}(g_{ri} - g_{ni}) - \sum_i (P_{ri} - P_{ni})(g_{ri} - g_{ni}) \quad (7.5)$$

$$= (g_r - g_r^*) + (g_r - g_r^{**}) - \sum_i (P_{ri} - P_{ni})(g_{ri} - g_{ni}) \quad (7.6)$$

As before there is an interaction term which will be negative if there is a positive correlation between weight and rate differences.

The two components of growth were calculated for the 100 industries and the two major regions for the intervals between the years previously used namely for 1929-32, 1932-36 and 1929-36. It should be remembered that, in so far as each interval represents a different length of time, the components for different periods are not directly comparable.

Table 7.6

Shift-Share Analysis for Employment Growth in Two Major Regions

	1929-32 (g_n = 8.96)			1932-36 (g_n = 16.28)			1929-36 (g_n = 5.87)		
	$g_r - g_n$	$g_r - g_r^*$	$g_r - g_r^{**}$	$g_r - g_n$	$g_r - g_r^*$	$g_r - g_r^{**}$	$g_r - g_n$	$g_r - g_r^*$	$g_r - g_r^{**}$
Inner Britain	+5.24	+ 1.89	+ 1.45	+ 2.91	+ 1.41	+ 1.28	+ 8.89	+ 3.64	+ 3.13
Outer Regions	-5.20	- 4.13	- 1.44	- 3.24	- 1.44	- 1.42	- 8.83	- 5.69	- 3.10

The results in Table 7.6 indicate that both industrial distribution and regional growth rate differences were important, particularly the former which contributed especially during the slump of 1929-32 in the Outer Regions. The large positive interaction term for Inner Britain 1929-32 suggests a strong negative relationship between weight and rate differences that is somewhat puzzling since it is not reflected in the results for Outer Britain. This disappears for 1932-6 and a check on the figures does not reveal an obvious reason for it.

The same exercise can be repeated for the nine Ministry of Labour divisions across 30 industries, the results of which are given in Table 7.7. For the two major regions the results are similar to those obtained for 100 industries including the large interaction term for Inner Britain 1929-32. Among the individual divisions of Inner Britain, there are some noticeable differences. The most important component maintaining employment in London during the slump of 1929-32 was its industrial distribution and to a lesser extent, this is true for the South West. In the South East and the Midlands, growth rate differences in individual industries are relatively more important. This reflects the small share of staple industries and heavy manufacturing in the first two regions while in the other two, it reflects the buoyancy of manufacturing industries such as engineering and vehicles compared with other areas. It appears to be

Table 7.7

Shift-Share Analysis of Employment Growth for Ministry of Labour Divisions by 30 Industries

	1929-32 (g_n = -9.54)			1932-36 (g_n = 16.77)			1929-36 (g_n = 5.64)		
	g_r-g_n	$g_r-g_r^*$	$g_r-g_r^{**}$	g_r-g_n	$g_r-g_r^*$	$g_r-g_r^{**}$	g_r-g_n	$g_r-g_r^*$	$g_r-g_r^{**}$
London	+8.30	+7.64	-0.40	-0.29	-2.46	-0.12	+9.40	6.57	-0.55
South East	+10.80	-2.73	+5.52	+7.09	+3.51	+2.60	+19.78	+0.61	+9.48
South West	+6.58	+5.53	+2.41	+0.73	+3.79	-2.99	+8.38	+9.32	+0.93
Midlands	+1.27	-2.89	+2.21	+7.10	+2.50	+3.66	+7.99	-1.12	+5.57
North East	-8.81	-9.48	-1.60	+0.73	-1.63	+1.49	-8.59	-13.01	-0.69
North West	-4.27	-4.53	-0.46	-8.04	-4.83	-4.00	-11.93	-9.16	-4.03
Scotland	-3.23	-2.35	-2.02	-0.69	-0.94	+0.44	-4.38	-2.48	-2.62
Wales	-12.06	-9.75	-3.38	-9.16	-6.04	-4.42	-21.28	-15.19	-7.33
Northern Ireland	-1.63	+0.97	-3.91	+2.94	+3.29	+2.99	+0.69	-3.00	+3.57
Inner Britain	+6.40	+2.42	+1.69	+3.12	+1.83	+0.95	+10.49	+4.68	+3.02
Outer Regions	-6.04	-4.75	-1.64	-3.28	-1.82	-0.95	-9.83	-6.85	-2.84

these conflicting trends which give rise to the anomalous result for Inner Britain. Industrial composition is the more important factor in the contraction of employment in the outer regions especially in Wales and the North East but not in Northern Ireland.

In the recovery of employment from 1932 to 1936, composition and rate effects are more evenly balanced and both continue to impose a substantial disadvantage in the Northern divisions and Wales. It is interesting to examine the recovery in Scotland which was referred to earlier which, together with Northern Ireland, appears rather different. Though Scottish employment contracted more sharply than the aggregate during 1929-32, it was very close to the national average in recovery and its industrial structure proved a slight disadvantage in the recovery without which above average growth would have occurred. A more striking illustration of recovery in the Outer Regions is given by Northern Ireland which continued to benefit from its industrial structure. Surprisingly, in the South, London and the South West do no better than the nation as a whole. In the former, industrial structure now proves to be a disadvantage while, in the latter, growth rate differences offset favourable structure.

It is clear from the results that Fogarty's claim that regional growth is merely a reflection of industrial growth is not supported, at least in the accounting context of shift-share analysis since, at least in the Northern divisions and Wales, industries grew slower than the national average and, in the South East and Midlands, they showed a tendency to grow faster. However, the claim cannot be dismissed quite as easily as this since it has been strongly argued that the shift-share approach is not an adequate method for determining the underlying cause of differences in employment growth[1]. As was mentioned earlier in the context of

[1] This point has been put most forcibly by McKay (1968).

unemployment, some of the effects of expansion or contraction of industries might show up as regional effects in other industries. This could occur both because changes in incomes resulting from the expansion of one industry in a region could raise demand for the products of other industries in that region, which would cause further expansion through the regional multiplier or because regional input-output connections could result in backward linkages between one industry and another within the region. These effects are likely to have been quite important and Richardson, for example, discussing the slow rate of expansion during recovery of the northern regions, argued that these were held back by "low purchasing power and high secondary unemployment resulting from the depressed regions' heavy reliance on staple industries ..." (1967, p. 278).

One way of approaching this problem is to examine the statistical relation between the growth rate of an industry in a region and the overall growth rate of the industry and the region. If there were a distinct regional component to employment growth, then we should expect in a cross section of industries by regions to find a stable relationship between the growth of a region and the growth of an industry in that region. Given that industry growth is also obviously a cause of differences, this should clearly be taken into account. For the whole cross section of industries we may specify the following equation

$$(1+g_{ri}) = \gamma_1(1+g_r) + \gamma_2(1+g_i) + u_3 \qquad (7.7)$$

The equation is specified in terms of $(1+g) = E_t/E_{t-n}$ in order to reduce the problems of exceptionally large values of g_{ri} when the industry is initially very small. If the differences in growth rates are explained only by the differences in industrial growth rates, then γ_2 should be significant and close to one. If there is a systematic regional component

to growth, then γ_1 would be positive and significant and γ_2 accordingly smaller than one. A natural restriction to impose on the regression would be that γ_1 and γ_2 should add up to one but this was not imposed in order that the significance test on γ_1 and γ_2 could be separate. However, the equation was restricted not to have a constant term which would be meaningless in the context[1].

The equation would not necessarily be expected to give the same results for different groups of industries and regions as across all industries and regions. One important reason is that demand for the products of some industries would tend to be more localised and others less so. In the "export base" approach to determining regional employment, some industries are regarded as serving national or international markets and are, therefore, not dependent on local demand, in which case induced effects of regional expansion will be small and, within the region, the industry's growth will reflect that of the industry as a whole. These industries should therefore be closest to the case of pure industry determination with γ_2 close to one and γ_1 close to zero. The staple industries are the most obvious group to fall into this category though it might be extended to others serving a national market. At the other end of the scale are industries which trade very little outside the region and these can be characterised as predominantly service industries though other localised industries such as building and small scale manufacturing might also be included. It was also considered that the results might differ among

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[1] An alternative formulation which was also considered was

$$(1+g_{ri}) - (1+g_i) = \gamma_o' + \gamma_1'(1+g_r) + u_3'$$

This explains the difference between the growth rate of an industry in a region and the industry wide growth rate by the region wide growth rate.

Table 7.8

Regional/Industrial Growth Rate Equations - All Industries

	1929-32			1932-36			1929-36		
	$(1+g_r)$	$(1+g_i)$	$\bar{R}^2$	$(1+g_r)$	$(1+g_i)$	$\bar{R}^2$	$(1+g_r)$	$(1+g_i)$	$\bar{R}^2$
UK (n=252)	0.0874 (0.0553)	0.9326 (0.0532)	0.9777	0.1283 (0.0725)	0.8749 (0.0694)	0.9688	0.0226 (0.0721)	1.0002 (0.0681)	0.9527
IB (n=112)	0.2771 (0.0756)	0.7567 (0.0777)	0.9832	0.4609 (0.0903)	0.5320 (0.0892)	0.9783	0.1544 (0.1074)	0.8925 0.1110	0.9583
OR (n=140)	-0.1598 (0.0848)	1.1394 (0.0768)	0.9755	-0.1073 (0.1063)	1.1073 (0.0991)	0.9652	-0.2400 (0.1132)	1.2017 (0.0981)	0.9507
				Staple Industries					
UK (n=54)	0.2420 (0.1017)	0.7392 (0.1241)	0.9622	0.1907 (0.2008)	0.8109 (0.1799)	0.9215	0.6602 (0.1499)	0.2229 (0.1765)	0.9525
IB (n=28)	0.4204 (0.1369)	0.5911 (0.1654)	0.9653	0.8272 (0.1593)	0.1172 (0.1519)	0.9677	0.8401 (0.2488)	0.0612 (0.3058)	0.9387
OR (n=26)	-0.0045 (0.1102)	1.0000 (0.1363)	0.9790	-0.2471 (0.3540)	1.2649 (0.2949)	0.9223	0.3614 (0.1544)	0.5337 (0.1712)	0.9783
				Service Industries					
UK (n=80)	0.0911 (0.0821)	0.9285 (0.0705)	0.9957	0.1005 (0.1135)	0.9109 (0.1149)	0.9894	0.1609 (0.0835)	0.8786 (0.0722)	0.9865
IB (n=35)	0.2076 (0.1358)	0.8310 (0.1251)	0.9968	0.1774 (0.1457)	0.8377 (0.1518)	0.9933	0.3021 (0.1301)	0.7549 (0.1255)	0.9885
OR (n=45)	-0.2121 (0.1545)	1.1641 (0.1242)	0.9953	0.0196 (0.1751)	0.9854 (0.1733)	0.9862	-0.0336 (0.1359)	1.0231 (0.1074)	0.9856

(Standard errors in parentheses)

different types of regions and here the most obvious distinction to make is between Inner Britain and the Outer Regions.

The results are reported in Table 7.8 for all industries and two sub sets for industries for the U.K. and Inner Britain (IB) and the Outer Regions (OR)[1]. Where an industry was not represented in a region the observation was omitted, leaving a total of 252 observations for each of the three time intervals. The seemingly high explanatory power of the equations as evidenced by the high levels of $\bar{R}^2$ should not be taken too seriously since there is no constant in the equation.

For all industries and all regions the results strongly support the view that industrial growth is the prime determinant since the coefficient γ_2 on aggregate industry growth is highly significant and close to one while the regional growth coefficient γ_1 is not significantly different from zero. The picture changes somewhat when the two major regions are separated. In Inner Britain the regional growth rate does appear significant though not for the whole interval 1929-36 and there is a tendency for the size of the industrial coefficient to fall. In the outer regions, however, it exceeds one and the regional coefficient is negative. This reflects the fact that industries grew faster in the South due in part to distinctly regional factors and though industrial growth was more dominant in the Outer Regions, industries nevertheless grew more slowly there.

Several different definitions of "export base" industries were tried and the results reported are for a small group of staple industries which consists of Coal, Steel, Cotton, Woollens, Shipbuilding and General

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[1] For each of the major regions, the values of $1 + g_i$ appearing as regressions are for the UK as a whole, not just the group of regions concerned.

Engineering. Surprisingly, for the UK as a whole, industry growth is a less dominant factor particularly over the whole period 1929-1936 when the coefficient is not significant but there is a striking difference between the two major regions. In Inner Britain, regional growth is dominant over the whole period and the industry growth gives a coefficient close to zero. For the Outer Regions, the industry growth is much more important though, over the whole period, it is still surprisingly low. One possible explanation for the findings is that, in each region, these industries are closely linked with others through regional input-output connections and that the interdependent growth of these groups is closely related to regional growth.

The group of service industries contains diverse industries such as Transport, Power Supply and Laundry Distribution, Banking and Finance and Leisure Industries[1]. The estimates for these are much closer to the pattern for all industries with industrial growth the dominant factor. As before. this is more marked in the Outer Regions than in Inner Britain where regional growth is significant at least for the whole period of 1929-36. A number of other sets of industries were tried, one of which was to be industries with over 70% of their employment in either of the two major regions as the export base industries for the regions. These results tended to confirm the differences between regions rather than between different groups of industries with Inner Britain showing stronger regional effects than the Outer Regions. The overall pattern of results emphasises the importance of industry growth as a systematic influence in different regions while the impact of regional growth is less systematic across industries but appears stronger in the South.

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[1] The nine industries included in this group are Gas, Water and Electricity, Tramway and Omnibus Industries; Road transport not separately specified; Shipping Service; Distributive trades; Commerce, Banking, Insurance and Finance; Entertainments and Sports; Hotel, Public House, Restaurant, Boarding House, Clubs etc. Services: Laundries, Dyeing and Drycleaning.

7.3 Time Series Variations in Industrial and Regional Unemployment Rates

The maldistribution of unemployment across regions and the coincident differences in industrial structure, have led some observers to the view that some measurable proportion of unemployment could be regarded as "structural". Though the term is not often given a rigorous definition, it is often taken as synonymous with some minimum level of unemployment which the economy could have achieved had a sufficiently high level of aggregate demand been maintained.

An official report for 1935 estimated that between 800 and 900 thousand of the unemployed could be attributed to geographical maldistribution (Howson, 1981, p. 273). Fogarty calculated "excess" unemployment in each region as all unemployment in excess of that which would yield the same unemployment percentage as in London and the South-East. This gave totals of 573 thousand in 1929, 1054 thousand in 1932 and 580 thousand in 1937. Since 1929 and 1937 were cyclical peaks, the "excess" unemployment at these dates, which amounts to about 6% of the labour force, was referred to as "persistent" excess unemployment (1945, Table 3,p.5)[1]. Subsequent writers have taken figures of about 6% as the best estimate of "hard core structural unemployment"[2]. It is clear from the figures that excess unemployment calculated in this way increased in the depression of the early 1930s and then declined again in recovery. Hence the persistent excess observed should not be taken to represent a fixed lower bound on the maldistribution of the labour force relative to employment. It seems likely that, had the peak in activity been higher, the component measured

[1] These calculations are also reproduced in Aldcroft (1971) p. 86.

[2] Glynn and Oxborrow (1976) p. 157. A figure of 8% is quoted by Constantine (1980) p. 15.

as persistent excess would have been smaller and the regional problem would have appeared less acute (McCrone, 1969, p. 102). This would be the case if, due to the combined effects of industrial composition and other factors, high unemployment regions were more cyclically sensitive than those with low average unemployment.

For the postwar period, efforts have been made to measure the cyclical sensitivity of unemployment in different regions by estimating time series equations in which the unemployment percentage of a region is a function of the national unemployment percentage. In his study, Thirwall estimated a model which was linear in unemployment percentages. This gave coefficients on national unemployment larger than one for high unemployment regions and smaller than one in low unemployment regions, which suggests that regional differentials tend to decrease as aggregate unemployment falls (1966, p. 210). In a similar study Brechling estimated a model which was logarithmic in unemployment percentages. This gave the opposite result; the coefficients or aggregate unemployment were generally higher in high unemployment regions (1967, p. 10). At one level all this reflects is the fact that, as aggregate unemployment falls, absolute differences between percentages in high and low unemployment regions decrease while their ratios increase.

However there is a more serious question about the manner in which such equations should be specified and interpreted and neither specification is entirely satisfactory in this respect[1]. Cyclical fluctuations arise

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[1] It has been argued, for example, by Gordon (1979) that if migration between regions is an exponential function of the aggregate unemployment rate, then the appropriate functional form lies somewhere between the two alternative specifications.

directly or indirectly from variations in employment and the appropriate functional form should relate employment variations in the region proportionately to those on the aggregate. Since the focus is on unemployment and there will generally be some cyclical sensitivity in participation rates, the model to be used is specified as logarithmic in the employment rate E/L which, in percentage terms, is 100 - U. Following the convention, a constant term is included and a time trend which attempts to capture the net effects of secular growth trends in regional employment and labour force, relative to the aggregate. This gives the equation to be estimated as

$$\ln (100-U_r)_t = \partial_o + \partial_1 \ln(100-U_r)_t + \partial_2 t + u_{4t} \qquad (7.8)$$

If $\partial_1 > 1$, then the region is cyclically sensitive compared with the aggregate, such that a one per cent change in the aggregate employment rate implies a larger change in the regional rate. Whether there is a tendency for unemployment rates to converge in cyclical expansion depends on both ∂_o and ∂_1 and whether there is secular convergence, on ∂_2.

The data used in estimating the equation are annual averages of monthly observations of the unemployment percentage for the nine Ministry of Labour Divisions from 1923 to 1938[1]. Some small adjustment to the data was occasioned by the changes in regional classification which took place in 1937[2]. The results given in Table 7.9 show that, with the exception of Northern Ireland, a good fit is obtained though there is evidence of serial correlation in most of the equations. This reflects the fact that cyclical variations in the regions do not depend solely on the aggregate but also on factors which give rise to slightly different regional

[1] These percentages are the same ones which are widely referred to in the literature for instance Beveridge (1944), p. 61, Gilbert (1971) Appendix 1, p.312 Booth and Glynn (1975), p. 633.

[2] The only change important enough to affect the regional unemployment percentages was the introduction of a new Northern region which was carved out of the North-East and North-West divisions. This was, therefore, the only adjustment made to the data.

Table 7.9

Estimates of Regional Unemployment Equations 1923-38

Region	(Constant)	(In(100-U_n))	(Time)	$\bar{R}^2$	D.W.	Average Unemployment Rate
London	2.1728 (0.3163)	0.5235 0.0705	0.0015 (0.0007)	0.7808	0.5708	8.48
South East	1.9310 (0.3163)	0.5804 (0.0705)	0.0008 0.0007	0.8222	1.0152	8.96
South West	1.2257 (0.2888)	0.7318 (0.0644)	0.0012 (0.0007)	0.8979	1.0473	10.42
Midlands	-0.0563 (0.2537)	1.0141 (0.0566)	0.0021 (0.0006)	0.9561	0.7435	11.94
North East	-1.8525 (0.3906)	1.4056 (0.0871)	-0.0001 (0.0009)	0.9517	0.5613	17.96
North West	-1.3665 (0.4967)	1.3000 (0.1108)	-0.0013 (0.0011)	0.9177	1.3795	17.53
Scotland	-1.5234 (0.3952)	1.3349 (0.0881)	-0.0016 (0.0009)	0.9499	0.9046	17.86
Wales	-2.6943 (1.2722)	1.5975 (0.2837)	-0.0104 (0.0029)	0.8116	0.6969	23.54
Northern Ireland	1.4568 (1.1006)	0.6617 (0.2455)	-0.0063 (0.0025)	0.5561	1.3434	22.41

(Standard errors in parentheses).

cycles[1]. The coefficients ∂_1 on the national employment rate are all highly significant and show a strong tendency to increase with the average rate of unemployment across regions which is given in the last column. The coefficient ∂_2 is negative in high unemployment regions and positive in high unemployment regions which implies a tendency towards secular divergence among unemployment rates. The tendency for unemployment rates to converge in the upswing of the cycle, which is evident in the data can best be illustrated by calculating the rates predicted by the equations for different national unemployment rates[2].

Table 7.10

Predicted Unemployment Percentages

	National Rate			
	20%	15%	10%	5%
London	16.61	8.76	5.99	3.28
S.E.	11.56	8.39	5.30	2.28
S.W.	14.85	10.98	7.18	3.43
Midlands	17.85	12.64	7.43	2.21
N.E.	25.87	19.27	12.52	5.61
N.W.	25.03	18.88	12.62	6.26
Scotland	25.55	19.27	12.87	6.35
Wales	33.18	26.39	19.35	12.07
N.I.	26.79	23.79	20.85	17.96
SD of $\hat{U}_r$	7.20	6.17	5.34	4.93
" " " exc NI	7.36	5.95	4.48	3.05
SD of $\hat{U}_r/\hat{U}_n$	0.36	0.41	0.53	0.99
" " " exc NI	0.37	0.40	0.45	0.61

[1] These have been discussed by Richardson (1967), pp. 266-7, 275-6.

[2] Since the estimating equations have time trends, the predicted rates will depend on the year of observation which was taken for ease of calculations as 1932 (when t = 10).

The first three columns are within the range of observation but the fourth which predicts regional rates for 5% national unemployment is more conjectural. The projection gives plausible magnitudes which, if anything, will be biased towards a greater spread of unemployment rates than would actually occur if some markets began to reach full employment. The standard deviation of the absolute unemployment percentages shows the tendency towards convergence - a tendency which is increased when Northern Ireland is excluded. As expected, relative to the national rate, the dispersion increases as unemployment falls though by less when Northern Ireland is omitted.

The same exercise can be performed on data for industrial employment rates to see if the pattern of convergence is similar for industries as for regions. Time series equations for 1923-38 similar to those for the regions were estimated for 36 industries and the results are given in the Appendix 7A.1. The equations on the whole give a good fit and the coefficient ∂_2 fails the significance test at the 5% level in only five cases. With few exceptions, industries with average unemployment rates above the national average are cyclically sensitive as measured by $\partial_2 > 1$. Calculating predicted unemployment rates as before gives plausible values in most cases but, in five of the equations, negative values are predicted for a national unemployment rate of 5%. It is interesting to note that these are in the iron and steel and engineering sectors and this probably reflects in part the disproportionate expansion of these industries in the late 1930s with the stimulus of rearmament. This is consistent with the relative tightness of the labour market in engineering observed from 1937 and, in any event, it seems likely that these industries would be among the first to reach full employment in cyclical recovery.

The standard deviations of the differences and ratios of predicted unemployment percentages from the equations are given in the following table.

Table 7.11

Standard Deviations of Predicted Percentages

National Rate	20%	15%	10%	5%
SD of $U_i - U_n$	10.3	7.4	5.2	5.7
" " " excluding 5 industries	9.9	7.4	5.2	4.9
SD of U_i/U_n	0.52	0.49	0.52	1.15
" " " excluding 5 industries	0.50	0.49	0.52	0.98

The results show substantial declines in the standard deviation of the absolute percentages which continues to the conjectural 5% level if the five industries are excluded. The standard deviations of ratios are also somewhat similar to those for the regions and the sharp rise at the 5% rate is somewhat reduced when the five industries are omitted.

The equations clearly underline the relative volatility of employment rates in the staple industries and in engineering compared with other sectors. The employment rate elasticities ∂_2 for Coal, Iron and Steel, General and Electrical Engineering, Shipbuilding and Cotton Textiles are among the highest of all the industries examined. In general those industries which were most dependent or most closely associated with the more volatile components of aggregate demand, such as exports and investment, tend to exhibit greater variations in employment rates relative to the aggregate. It is clear that a substantial part of the differences in regional elasticities are attributable to this. This effect would be

enhanced if a higher proportion of employment in the Outer Regions were associated with the more volatile components of demand within each industry as well as between industries.

Some impression of the implication of the differing industrial composition of each region can be gained by calculating the weighted average of elasticities appropriate to each region. This was done for the thirty industries examined earlier in the cross section and the weights used are those for the labour force shares in 1929 .

Table 7.12

Regional Employment Rate Elasticities (β_i) calculated from Equations by Industry

Inner Britain		Outer Regions	
London	0.73	North East	1.37
South-East	0.85	North West	1.36
South-West	0.94	Scotland	1.23
Midlands	1.12	Wales	1.51
		Northern Ireland	1.17

These are not directly comparable with the time series regional estimates since only thirty industries are included but the pattern is very close to that emerging from the regional equations. The regions of Inner Britain are somewhat above the earlier estimates and, in the Outer Regions, Northern Ireland appears again to be the exception.

All the evidence so far examined points to a close association between the industrial composition of regions and their cyclical sensitivity and it is important to ask how far this is reflected in dependence on different components of aggregate demand. This is an important issue, both for the diagnosis of structural unemployment and the evaluation of potential economic policies. The dependence of staple industries on exports is well known and often regarded as the major single determinant

of unemployment differences. The regional impact of investment, the next most important source of fluctuations is less clear cut since some investment good industries, such as building, are fairly evenly distributed while others are less so.

The importance of the broad sectoral composition of expenditure can be examined by attempting to explain the employment rate in the region relative to that in aggregate $(100 - U_r)/(100 - U_n)$ as a function of the proportion of exports and investment in total expenditure X/Y and I/Y respectively. The following equation specifies this relationship in logarithmic form.

$$\ln \frac{100 - U_r}{100 - U_n}_t = \varepsilon_o + \varepsilon_1 \ln \frac{X}{Y}_t + \varepsilon_2 \ln \frac{I}{Y}_t + \varepsilon_3 t + u_{5t} \qquad (7.9)$$

A constant is included and a time trend to account for secular changes in relative employment rate ratios. If the variations in this ratio can be explained by these major elements in the composition of demand, then ε_1 and ε_2 should be significant. Regions which are disproportionately dependent on exports or investment would be expected to have positive values of ε_1 and ε_2 and those with less than average dependence, negative values.

The equations were estimated using the same data on unemployment as in the previous estimates and Feinstein's estimates of exports, investment and GDP at constant 1938 prices. The results given in Table 7.13 indicate that between a quarter and a half of the total variation is explained by the equations except for Northern Ireland. As expected the coefficient on the export ratio is negative and significant for the three southern divisions. For London and the South-East, a 10 per cent rise in the export ratio reduces the employment rate ratio by 3 per cent.

Table 7.13

Equations for Employment Rate Differentials 1923-38

Region	ε_o (Constant)	ε_1 ($\ell n(X/Y)_t$)	ε_2 ($\ell n(I/Y)_t$)	ε_3 (t)	$\bar{R}^2$	D.W
London	-0.1048 (0.2035)	-0.3078 (0.0963)	0.1158 (0.0949)	-0.0091 (0.0042)	0.5092	1.2281
South East	-0.0254 (0.1703)	-0.3040 (0.0805)	0.1417 (0.0794)	-0.0102 (0.0036)	0.5349	1.7822
South West	0.0064 (0.1254)	-0.2151 (0.0593)	0.1156 (0.0585)	-0.0069 (0.0026)	0.5800	2.0922
Midlands	-0.0116 (0.1046)	0.01128 (0.0495)	-0.0144 (0.0488)	0.0026 (0.0022)	0.4070	0.7584
North East	0.0386 (0.2068)	0.2672 (0.0978)	-0.1217 (0.0965)	0.0094 (0.0043)	0.2983	1.0376
North West	0.1059 (0.2251)	0.1990 (0.1064)	-0.0597 (0.1050)	0.0052 (0.0047)	0.2324	1.4442
Scotland	0.3418 (0.1543)	0.2622 (0.0730)	0.0042 (0.0720)	0.0060 (0.0032)	0.6246	1.0265
Wales	-0.2714 (0.5713)	0.2984 (0.2702)	-2787 (0.2665)	0.0020 (0.0120)	0.5024	0.7961
Northern Ireland	-0.2136 (0.4837)	-0.0544 (0.2287)	-0.0341 (0.2256)	-0.0064 (0.0102)	0.0614	1.0204

(Standard errors in parentheses)

Similar orders of magnitude are found in the positive coefficients for the Outer Regions though the coefficient is not significant for Wales. For investment the sign pattern is reversed and an increase in the share of investment tends to benefit the southern regions relative to the country as a whole. For the Outer Regions, the coefficients are generally not significant so that the effect is less clear.

Exports appear to be a more important determinant of regional differences than investment. Taking a rough average coefficient of -0.2 for Inner Britain and 0.2 for the Outer Regions suggests that the export ratio would have had to be some 17-18 per cent higher in 1929 and a third higher in 1936 to bring the two major regions into balance. However, too much reliance should not be placed on these results since the export ratio is positively correlated with aggregate output. In order to test for the independent effects of composition, allowing for cyclical movements in the relative employment ratio, an additional term, the log of total output, was included. This tended to dominate the equation and reduced the significance of the other terms generally changing the sign on the export ratio. It seems unlikely that the dependence of regions on particular types of markets can be untangled from the differences in cyclical sensitivity arising from the spillover of demand into relatively high unemployment regions and the induced effect of expansion operating within in and between regions.

7.4 Labour Mobility and Excess Supply of Labour

The extent to which particular changes in geographical and industrial distribution of employment will lead to persistent imbalances in unemployment percentages between industries and regions, depends on the degree of labour mobility. But only if the resulting maldistribution, by imposing labour shortages in some parts of the economy, kept aggregate employment lower than otherwise, can lack of mobility be said to have impeded recovery and readjustment. If excess supply of labour characterised almost all labour markets, then at least over the observed range of variation, it did not provide a binding constraint. Even so, it might be desirable to encourage migration of labour away from high unemployment areas not only to provide an appropriate distribution of labour sources in the event of widespread economic recovery but also to mitigate the inequalities of employment opportunities which would persist if the recovery failed to occur.

Public policies introduced from the late 1920s onwards had as their objective the equalisation of economic opportunities through attempting to reduce the high unemployment of the most depressed areas relative to the rest of the country. In 1928 a policy of industrial transference was introduced in an effort to move workers from depressed to prosperous areas but with the coming of the Special Areas Act in 1934, the emphasis shifted towards providing incentives to increasing employment in depressed areas rather than moving workers away from them. Though several reasons, such as the avoidance of congestion in the more prosperous areas, were behind this change of policy, it is undoubtedly connected with the fact that the policy of industrial transference was judged a failure. From 1928 to 1938 in excess of 200,000 workers were transferred, though as many as half of these returned to their place of origin[1]. In its early stages the transfers were quite successful but, from 1929, transferees increasingly

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[1] Barlow Commission, p. 152, Pollard, 1968 p. 133.

failed to retain their jobs both because of worsening unemployment, even in the most prosperous areas, but also because they were thought to be generally less suitable (Dennison, 1939, p. 175-6).

Nevertheless, over the period as a whole, substantial redistribution of the insured population took place. In 1923, Inner Britain contained 46.8% of the insured population; by 1929 this had risen to 49.1% and, by 1938, to 52.3%. These movements closely paralleled the changes in the share of total employment which rose from 47.6% in 1923 to 54.5% in 1938 but were not large enough to reduce the differences in unemployment rates (Dennison, 1939, p. 141).

Insofar as these long term changes were due to migration, the overwhelming majority was voluntary and unassisted. Differences in unemployment rates between areas were clearly an important determinant of migration rates. At the county level between 1927 and 1937 the insured population of Buckinghamshire rose by 62.1% and that of Oxfordshire by 49.7% while that of Glamorgan fell 4.1% (Beveridge, 1944, Table 6 p.63). In their study of migration patterns, Makower Marshak and Robinson found that there was a close correspondence between the percentage of the labour force in a county out migrating and the proportionate difference between its unemployment rate and that of the whole country. The finding that migration rates fell by about a third between 1925-31 and 1931-36 is consistent with migration depending on relative employment rates. It suggests that because of increasing dispersion of relative unemployment rates at lower aggregate unemployment levels, migration would quicken with a rise in levels of activity. According to the estimates, at the observed unemployment rates of 1925-31, it would have taken 6 years to equalise unemployment rates while, at those of 1931-6, it would have taken about 32 years (1939, p. 83).

It has been suggested that there were severe impediments to mobility for a large proportion of the work force and that, as a result, it was "much less than might have been anticipated" (Glynn and Oxborrow, 1976, p. 155). A study by Daniel of the patternof migration from Wales into the prosperous area of Oxford showed that, among married men, the duration of unemployment prior to migration was much greater than for single men but not for those without children. The loss of non pecuniary income and differences in costs of living provided an impediment to mobility to which the differences in unemployment benefit entitlement might also be added (1939, p. 169-170). But as Glynn and Oxborrow recognised, "above all the fact remained that unemployment was high even in expanding areas and migration did not necessarily offer any guarantee of employment" (1976, p. 155). This appears to have been the case in Oxford. In November 1937, when the unemployment rate was about 7%, about 55% of those whose insurance books originated in other exchange areas were recorded on the claims register. Thus, even when workers did move to more prosperous areas, they found themselves at a disadvantage compared with the indigenous labour force. Of a sample of 136 of the Oxford migrants on the register, nearly two thirds had become unemployed within the first three months of reaching Oxford (Makower et al. 1938, p. 88).

In such areas as Oxford with an employment structure based upon motor vehicles and light engineering, immigrants from Wales and Lancashire would have been less likely to possess the appropriate skills. Allowing for

relative unemployment rates, the size of the catchment area and its distance from Oxford, it was found that they were less numerous among immigrants than workers from areas where agriculture and building took a larger share of the labour force (Makower et al. 1938, p. 115). Half of those in the motor industry at Dagenham whose insurance books originated elsewhere were from the North Western Division, while miners from the North-East and Wales moved disproportionately to the Kent coalfield and Scots focused more on London (Thomas, 1934, p. 225). The transfer of relatively unskilled labour from one industry to another was widespread and it is well known that migrating miners often found themselves working in building and public works. These, together with road transport and other service industries in the South were particularly subject to invasion from more depressed industries (Beveridge, 1936 p. 374). But in Oxford nearly a half of those in the motor industry in 1936 were workers whose insurance books were issued in another exchange area - a proportion exceeded only in omnibus service among major industries (Makower et al. 1938, p. 113). It appears that these were not just intra industry transfers but largely recruitment both from other industries and other regions[1]. It is clear that, in the main, the more rapidly growing industries recruited workers from industries where similar or related skills were used. Given the overall level of unemployment, these were not difficult to attract but the size of the pool upon which such industries could have drawn is less clear.

The evidence for labour shortages in the engineering trades in London has been examined in some detail by Allen and Thomas. The abnormal position of these trades has already been commented upon but, even so, there was

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[1] Dennison provides examples of a motor factory and a wireless factory of whose recruits 45% and 75% respectively had changed their occupation on entry (1939) p. 155.

found to be a relatively plentiful supply of labour with the exception of machine shop and tool room and for specific electrical work (1938, p. 110). Of a sample of 2500 workers placed by the labour exchanges, 54.8% of vacancies were filled immediately and another 29.3% within four days[1]. Although the more skilled the trade the longer the delays tended to be, it could hardly be argued that these reflected serious labour shortages and, given that this market was one of the tightest in the country, it seems unlikely that the economy as a whole would have reached binding constraints until a considerably higher level of activity had been reached. Substantially higher levels of employment would, of course, have engendered higher levels of migration but the evidence suggests that to a large extent, this would have been forthcoming and that the lags involved were relatively short (Makower et al. 1938, p. 110).

These findings suggest that the mere persistence of differences in unemployment rates cannot be taken as prima facie evidence of intractable labour immobility. There were a number of reasons why, with the levels and distribution of activity prevailing, unemployment differences did not disappear. There were fixed costs involved in geographical mobility and, given excess supply of labour even in prosperous areas, combined with the fact that immigrant workers generally had poorer employment prospects in the receiving areas than the indigenous workforce, the attractiveness of migration tended to increase as overall levels of activity rose.

Persistent differences in unemployment rates may also have been the result of disequilibrium resulting from the persistent differences in the growth rates of employment. High unemployment in a declining industry

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[1] It should also be noted that only about 40% of engineering vacancies were filled by the employment exchanges and it seems likely that the easier it was to fill a particular vacancy, the less likely that recourse to the exchange would be necessary. Hence those vacancies filled through the exchanges probably took longer to fill than the average. (Allen & Thomas, 1939, p. 272).

might obscure quite rapid outward transfers, even though the unemployment level remained above the average. At the industry level Beveridge compared unemployment percentages at 1937 with the growth rates of employment between 1923 and 1937. The lack of a strong relationship led him to conclude that "the dominant factor in determining the unemployment rate within a particular industry is not the rate at which the demand for labour is changing but the organisation of the industry" . He also examined the changes over time in unemployment rates at the local level in certain trades and found that the differences were as marked in the "progressing" as in the depressed industries (1944, p. 52).

Given the availability of data by industry by region, it is possible to examine the typical effects on unemployment of employment growth. This may be attempted using the following equation where the employment rate at time t is a function of employment growth in previous years and the employment rate at the beginning of the period which is denoted as time s [1].

$$\ln((100 - U_{ri})_t = \phi_o + \phi_1 \ln(1 + g_{ri}) + \phi_2 \ln(100 - U_{ri})_s + u_{6s} \quad (10)$$

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[1] The equation is best thought of as having been derived in the following way. A change in the unemployment percentage results from different rates of change of employment and the labour force. Defining g(L) as the labour force growth rate and g(E) as the growth rate of employment, the difference between these can be written as the difference in the log of employment rates at t and s.

$$g(E)_{1r} - g(L)_{1r} = \ln\left(\frac{E_{ri,t}}{E_{ri,s}}\right) - \ln\left(\frac{L_{ri,t}}{L_{ri,s}}\right)$$

$$= \ln\left(\frac{E_{ri,t}}{L_{ri,t}}\right) - \ln\left(\frac{E_{ri,s}}{L_{ri,s}}\right)$$

Rearranging

$$\ln\left(\frac{E_{ri,t}}{L_{ri,t}}\right) = \ln\left(\frac{E_{ri,t}}{E_{ri,s}}\right) - \ln\left(\frac{L_{ri,t}}{L_{ri,s}}\right) + \ln\left(\frac{E_{ri,s}}{L_{ri,s}}\right)$$

The growth rate of the labour force in ri relative to other markets

(ft.note continued on next page)

If over the period of observation, no labour force adjustment took place, then the variation in employment rates at time t will be exactly accounted for by the growth rates of employment and the initial employment rates such that $\phi_1 = \phi_2 = 1$. If, at the other extreme, adjustments in labour supply completely offset the effects of employment change on employment rates, then the model predicts $\phi_1 = 0$. In this case, if the overall change in employment rates took the form of a proportionate increase or decrease in all rates, then $\phi_2 = 1$ but if the change was more than proportionate $\phi_2 > 1$; if less than proportionate $\phi_2 < 1$. The equation was estimated for the three periods 1929-32, 1932-36 and 1929-36. Using the data for 30 industries and nine regions omitting the observations with zero cells and estimating using ordinary least squares, gives the results in Table 7.14.

Differences in proportionate employment changes during the recession of 1929-32 are reflected to the extent of about a half in employment rates in 1932 according to the estimate of ϕ_1. The estimated value of ϕ_2 exceeds

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footnote 2 continued from previous page

depends on the difference in the growth rate of employment and the initial deviation of the actual employment rate from the aggregate.

$$\ln \frac{L_{ri,t}}{L_{ri,s}} = f_o + f_1 \left[\ln \frac{E_{ri,t}}{E_{ri,s}} - \frac{\ln E_{n,t}}{\ln E_{n,s}} \right] + f_2 \left[\ln \frac{E_{ri,s}}{L_{ri,s}} - \ln \frac{E_{n,s}}{L_{n,s}} \right]$$

f_1 is predicted to be positive and f_2 negative. Since national employment growth and initial employment rate is constant in cross section, these can be absorbed into the constant term so that

$$\ln \frac{L_{ri,t}}{L_{ri,s}} = f'_o + f_1 \ln \frac{E_{ri,t}}{E_{ri,s}} - f_2 \ln \frac{E_{ri,s}}{L_{ri,s}}$$

$$\text{where} \quad f'_o = f_o - f_1 \ln \frac{E_{n,t}}{E_{n,s}} - f_2 \ln \frac{E_{n,s}}{L_{n,s}}$$

substituting this into the expression for the employment L rate at time t given above yields the equation given in the text where $\phi_1 = 1 - f_1$ and $\phi_2 = 1 - f_2$ and $\phi_o = f'_o$.

Table 7.14

	ϕ_o	ϕ_1	ϕ_2	$\bar{R}^2$
1929-32	-1.807	0.495	1.377	0.852
	(0.339)	(0.023)	(0.751)	
1932-36	-2.540	0.200	0.433	0.617
	(0.096)	(0.022)	(0.022)	
1929-36	-0.457	0.072	1.090	0.700
	(0.233)	(0.013)	(0.052)	

(Standard errors in parentheses)

one for this period but not significantly so and its significance compared with that of employment change indicates that the latter is the dominant variable affecting the structure of employment rates in 1932. The picture is changed in the recovery of 1932-36 when only a fifth of differences in proportionate employment changes are reflected in the structure of employment rates in 1936. The relationship between initial and end period employment rates becomes substantially stronger but less than proportional. For the period as a whole, it is clear that the differential declines and subsequent recovery of employment are, to some extent, offsetting but the remaining changes in employment structure have very marginal effects on employment rates. Though ϕ_1 and ϕ_2 are significantly different from zero and one respectively, they are numerically close to these values. Thus to a large extent Beveridge's findings are borne out. The change in employment structure occurring over the great depression had very little impact on the structure of employment rates which remained very close to that of 1929.

These findings are not surprising in that differences in employment change would be expected to be felt mainly in the short run but only give a limited indication of labour mobility. This would obviously differ

between industries and regions. Thus Beveridge found that "local immobility is a greater obstacle than industrial immobility to the adjustment of labour demand and supply, ..." (1944, p. 62) and Champernowne that "within each area labour flows fairly easily from one industry to another causing a levelling of unemployment percentages within the area" (1938, p.104).

This was borne out to a considerable extent by the finding of a substantial regional component to unemployment in the shift share analysis of section 7.1. An alternative way of examining this phenomenon is to see how far changes in the labour force attached to an industry in a region responded to changes in industrial and regional employment growth respectively. This can be done using the following equation[1]

$$\ln \frac{L_{ri,t}}{L_{ri,s}} = \eta_o + \eta_1 \ln \frac{E_{r,t}}{E_{r,s}} + \eta_2 \ln \frac{E_{i,t}}{E_{i,s}} + \eta_3 \ln \frac{E_{ri,s}}{E_{ri,s}} + u_7 \quad (7.11)$$

The change in the labour force attached to a particular industry in an area is expected to be positively associated with the growth of employment in the region as a whole and the industry as a whole through η_1 and η_2. The greater is industrial mobility, the larger η_2 and the greater regional mobility, the greater η_1. η_3 again represents adjustment to an initial disequilibrium employment rate, an initially high employment rate would be expected to lead to a greater increase in the labour force attached to the local industry and hence, η_3 is expected to be positive. Estimating equation 7.11 by ordinary least squares and using the same data as before, yielded the results given in Table 7.15.

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[1] This is a var iant of equation (7.10) as can be seen by reference to footnote 1, p. 7.42.

Table 15

	η_o	η_1	η_2	η_3	$\bar{R}^2$
1929-32	0.087	0.070	0.437	-0.251	0.318
	(0.013)	(0.105)	(0.043)	(0.129)	
1932-36	0.090	-0.117	0.610	0.480	0.306
	(0.038)	(0.209)	(0.070)	(0.522)	
1929-36	0.046	0.055	0.975	0.059	0.450
	(0.029)	(0.125)	(0.074)	(0.206)	

(Standard errors in parentheses)

The results offer some support for the findings of Beveridge and Champernowne. For 1929-32, η_2 is highly significant and η_1 is not so that within each region the growth of the labour force in an industry is associated more closely with the growth of employment in that industry than in the region. It also appears that, for the recession of 1929-32, changes in the labour force attached to an industry in a region are inversely correlated with employment rates in 1929. For 1929-32 coefficients η_1 and η_3 both change sign but are not significant. Thus in recovery, workers appear to have been attracted into labour markets with high employment rates in 1932 but did not follow the regional pattern of employment growth once differences in industrial employment growth are taken into account. Over the period as a whole, as might have been expected, it is only industrial growth which is important and the other coefficients are all very small.

These results have to be interpreted with caution as they tend to reflect the earlier findings, namely that the growth of employment in any labour market is closely associated with industrial growth and that, only in the short run are differences in growth rates reflected in

unemployment rates. Thus labour force trends in each area tend to reflect very closely the growth trend set by the industries in that area.

7.5 Unemployment Structure and Economic Policy.

The findings of the preceding sections may be briefly summarised. The examination of unemployment data reveals that unemployment was in an important sense both regional and industrial: high unemployment industries tended to have high unemployment relative to others in all regions; in high unemployment regions, rates in each industry tended to be higher than average. Similar results were obtained for employment growth but here individual growth rates were more strongly related to the growth of industries than regions. For both high unemployment industries and regions, employment rates were found to be cyclically sensitive so that they rose more rapidly in booms than those which had lower unemployment on average. Finally there is considerable evidence that labour was highly mobile both between industries and regions but that mobility tended to increase with activity. These findings suggest it may be a serious mistake to define and measure some concept of "structural unemployment" independently of the overall level of activity. It suggests that the constraints imposed by frictions in the labour market were not so great as to have prevented the economy from reaching substantially higher levels of employment than were attained in the peaks of 1929 and 1937. If expansion had continued along the lines typical in the actual cycles, employment would have grown faster in high unemployment industries and regions and labour would have moved more readily into those industries and regions where it became relatively scarce.

This evidence does not directly confront the question of what appropriate prescriptions for policy might have been had governments in the 1930's been committed to more expansionary policies than they were. Concern has frequently been expressed that structural problems would have needed to be taken into account as part of such a programme and recent discussion has drawn attention to Keynes' views on this issue in the later 1930's[1].

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[1] This has most recently been examined by Peden (1980).

Writing in the Times in 1937 he gave this warning: "I believe that we are approaching, or have reached, the point where there is not much advantage in applying a further general stimulus at the centre. So long as surplus resources were widely diffused between industries and localities, it was no great matter at what point in the economic structure the impulse of an increased demand was applied. But the evidence grows that ... the economic structure is unfortunately rigid and that (for example) building activity in the home counties is less effective than one might have hoped in decreasing unemployment in the distressed areas. It follows that the later stages of recovery require a different technique. To remedy the condition of the distressed areas, ad hoc measures are necessary" (Collected Works, 1982, p. 385). These strictures have been echoed more recently by Booth and Glynn who argued that "the interwar unemployment problem required a highly complex solution involving a wide range of ad hoc regional and industrial measures as well as pump priming at the national level" (1975, p. 630). Subsequently Glynn and Howells have argued against a policy of indiscriminate demand expansion and suggest that "what was required was a comprehensive regional policy promoted by the central government to ease the transfer from export oriented industries" (1980. p. 43).

In the General Theory, Keynes also put forward the view that expansion would eventually have encountered a series of bottlenecks which would limit the effects of public policy. The argument presented here suggests that the economic structure was not "unfortunately rigid" in that sense though it may have seemed that way. The bottlenecks were certainly not encountered to any serious extent until the war restored full employment. Had the level of demand been increased substantially, allocation would increasingly have relied on the price mechanism in addition to the distribution of excess supply and demand. The evaluation of these implications is beyond the scope of this chapter but it is not doubted that it would ultimately

have engendered some general price rise beyond what was experienced. The slope of the aggregate supply function would, however, depend on the distribution of additional demand and from any inherant failings of the policies of re-allocation which were pursued. But there was little chance of assisting the recovery of the economy as a whole in the absence of a general reflation. Hence, in this context regional policies should be regarded as subsidiary to aggregate demand policy and not the other way around.

The possible impact of aggregate demand policy was taken up in Chapter 5 but it is worth briefly reconsidering it from the point of view of the regional and industrial imbalance. Had expansion taken the form of public works centering on building and civil engineering, then regional policies might have become an increasingly relevant consideration. This appears to be what Booth and Glynn (1975) and Glynn and Howells (1980) had in mind when discussing the efficacy of demand management policies. Glynn and Howells argued that since regions tend to be more open than the national economy, regional multipliers would generally be lower than the natural multiplier. Thus regional multipliers would typically have been close to or less than one .

It is not possible to estimate what these would have been without knowing something about inter-regional trade flows. Such figures are not available for the interwar economy but Brown (1972, Table 3.12, p. 75) has estimated these flows for 1967. On postwar regional definitions, the ratios of inter-regional trade (defined as the average of imports and exports including overseas trade) to regional GDP ranged from 0.7 to 1.7

and averaged 1.2. It is likely that the interwar economy was somewhat less integrated than that of 1967 and given that there were also fewer re regions (as defined by the Ministry of Labour), typical import propensities would have been somewhat lower. Nevertheless, we can use the figures to perform some (purely illustrative) calculations to get a feel for what regional multipliers might typically have been. If we assume that the region is typical, then we may take the multiplier expression of Glynn and Howells and substitute regional import propensities for the national figure. Taking these as 0.7, 1.0 and 1.3 gives regional multipliers of 0.92, 0.74 and 0.63 respectively. These values are very low indeed and, if the assumptions are plausible, theyconfirm the suspicion that regional multipliers might have been less than one[1].

It must be noted that, of themselves, these low multipliers do not imply that "regional problems cannot be resolved at the national level" (Glynn and Howells, 1980, p. 44). Indeed, quite the reverse. The lower the regional multiplier, the smaller will be the impact of a pound spent in that region alone given that this results from the openness of the region. A situation with low regional multipliers tends, therefore, to be more favourable to a general expansion of demand as against a selective policy of regional spending which is presumably what is meant by "local

[1] It may seem that there is an inconsistency in using the values for regional trade flows which are larger than one since it is hard to imagine the marginal propensity to import to be this large. In this case it is implicitly assumed that imports are a function of exports as well as domestic spending. To illustrate with the simplest possible case, income can be regarded as generated from the following

$$Y = bY + X - c(bY + X)$$

where b is the marginal propensity to consume and c the "expenditure" import propensity which must be less than one. This gives a multiplier of $\frac{1-c}{1-(1-c)b}$ which may be less than one and an import ratio of $\frac{c}{1-c}$ which exceeds one if $c > 0.5$. Since only the ratio is known, this is used in the multiplier expression in the normal way so that

$$Y = bY + X + \frac{c}{1-c} Y .$$

ad hoc solutions".

However, this takes no account of the fact that some regions were more open to international rather than interregional exports. Thus a public spending programme might have a relatively small direct impact in the regions which were, after all, the most depressed even though the secondary effects on cyclically sensitive industries and the increased prospects for out migration might have helped. But it was argued in Chapter 5 that a lower exchange rate would have been a pre-condition for demand expansion in the 1920s and a direct corollary of it in the 1930s. Though the regional effects of export expansion could not be clearly distinguished, it seems likely that such a policy would have assisted the depressed regions both directly and indirectly.

Appendix 7A.1

Industrial Unemployment Equations 1923-38

$$\ln(100-U_i)_t = \partial_o + \partial_1 \ln(100-U_n)_t + \partial_2 t + u_{4t}$$

SECTOR	∂_o (Constant)	∂_1 ($\ln(100-U_n)_t$)	∂_2 (Time)	$\bar{R}^2$	D.W.	Average Percentage
Fishing	3.4612 (0.7730)	0.2332 (0.1724)	-0.0108 (0.0018)	0.7698	0.7797	17.8
Coalmining	-3.0381 (1.5916)	1.6808 (0.3550)	-0.0073 (0.0037)	0.7166	0.8919	20.1
Brick, tile, pipe etc. manufacture	-0.0076 (0.6571)	1.0051 (0.1466)	0.0013 (0.0015)	0.7659	2.1248	12.2
Pottery, earthenware etc.	-3.7738 (0.7756)	1.8284 (0.1730)	-0.0003 (0.0018)	0.8981	0.8392	21.8
Chemicals	0.6258 (0.3079)	0.8633 (0.0687)	0.0034 (0.0007)	0.9123	0.9388	10.5
Pig iron	-9.1511 (2.5875)	3.0087 (0.5771)	0.0116 0.0060	0.6269	1.5509	23.2
Steel smelting and iron puddling and iron and steel rolling & forging	-10.0846 (1.7697)	3.1998 (0.3947)	0.0156 (0.0041)	0.8104	1.5562	27.0
General engineering: engineers' iron & steel founding	-3.9486 (0.5310)	1.8638 (0.1184)	0.0108 (0.0012)	0.9440	1.1258	15.6

Appendix 7A.1 continued

SECTOR	∂_o (Constant)	∂_1 ($\ln(100-U_n)_t$)	∂_2 (Time)	$\bar{R}^2$	D.W.	Average Percentage
Electrical Engineering	-0.0320 (0.3039)	1.0177 (0.0678)	0.0034 (0.0007)	0.9375	1.5935	7.8
Construction and repair of motors, cycles and aircraft	-0.9460 (0.4408)	1.2147 (0.0983)	0.0043 (0.0010)	0.9097	1.3064	10.5
Shipbuilding and repairing	-17.324 (2.4222)	4.7894 (0.5403)	0.0153 (0.0056)	0.8376	1.0858	37.8
Stove, grate, pipe etc. and general ironfounding	-2.5792 (0.5730)	1.5656 (0.1278)	0.0065 (0.0013)	0.9080	1.3416	15.1
Electric cable, apparatus, lamps etc. manufacture:	1.5764 (0.6688)	0.6527 (0.1492)	0.0035 (0.0016)	0.5375	1.2276	9.1
Cotton textiles	-4.6709 (2.0628)	2.0254 (0.4601)	0.0032 (0.0048)	0.5555	1.3889	20.9

Appendix 7A.1 continued

SECTOR	∂_o (Constant)	∂_1 ($\ln(100-U_n)_t$)	∂_2 (Time)	$\bar{R}^2$	D.W.	Average Percentage
Wool textiles	-0.8698 (1.6863)	1.1876 (0.3761)	0.0014 (0.0039)	0.3723	1.2299	16.3
Linen textiles	0.7325 (2.5030)	0.8201 (0.5583)	-0.0046 (0.0058)	0.1368	1.7077	22.8
Hosiery manufacture	1.5410 (0.7009)	0.6643 (0.1563)	-0.0004 (0.0016)	0.5770	1.8248	10.6
Tailoring	1.8574 (0.3443)	0.5926 (0.7680)	-0.0032 (0.0008)	0.8864	1.4615	13.0
Dressmaking and millinery	3.1725 (0.3218)	0.3034 (0.0718)	-0.0003 (0.0007)	0.5866	1.0961	8.3
Boots, shoes, etc. manufacture	1.2232 (0.6194)	0.7284 (0.1382)	0.0022 (0.0014)	0.7332	1.8054	14.8
Bread, biscuits, cakes etc. manufacture	2.9533 (0.2654)	0.3482 (0.5919)	0.0003 (0.0006)	0.7086	0.5062	9.6
Drink industries	1.9851 (0.1401)	0.5698 (0.0313)	-0.0008 (0.0003)	0.9673	2.2518	8.9
Sawmilling & machined woodwork	0.2597 (0.2719)	0.9455 (0.0606)	-0.0003 (0.0006)	0.9514	1.3159	13.2

Appendix 7A.1 cont.

SECTOR	∂_o (Constant)	∂_1 $(\ln(100-U_n)_t)$	∂_2 (Time)	$\bar{R}^2$	D.W.	Average Percentage
Furniture manufacture & upholstery	-0.4171 (0.3307)	1.1053 (0.0738)	-0.0021 (0.0008)	0.9541	1.0182	11.6
Printing, publishing & bookbinding	2.7629 (0.1608)	0.3999 (0.0359)	-0.0011 (0.0004)	0.9257	0.8259	7.0
Building	-1.5319 (0.6007)	1.3419 (0.1340)	-0.0027 (0.0014)	0.9023	2.0083	17.3
Gas, water and electricity supply	3.2883 (0.2383)	0.2811 (0.0531)	-0.0020 (0.0006)	0.8096	0.6015	8.0
Railway service	1.1889 (0.4958)	0.7452 (0.1106)	0.0007 (0.0012)	0.7645	1.6630	9.1
Tramway and omnibus service	3.6458 (0.1231)	0.2061 (0.0274)	0.0001 (0.0003)	0.8072	0.9231	4.1
Other road transport	0.5637 (0.5196)	0.8661 (0.1159)	0.0018 (0.0012)	0.7901	0.5150	4.4
Docks, harbours etc. service	-0.0081 (0.9075)	0.9528 (0.2024)	0.0020 (0.0021)	0.5846	1.4706	30.0
Distributive trades	2.6091 (0.1674)	0.4329 (0.0373)	-0.0023 (0.0004)	0.9462	0.7710	8.6

Appendix 7A.1 continued

SECTOR	∂_o (Constant)	∂_1 ($\ln(100-U_n)_t$)	∂_2 (Time)	$\bar{R}^2$	D.W.	Average Percentage
National government service	3.4520 (0.5742)	0.2411 (0.1281)	-0.0033 (0.0013)	0.4797	0.3366	10.3
Local government service	2.7137 (0.5389)	0.4120 (0.1202)	-0.0102 (0.0013)	0.8852	0.6433	13.3
Hotel, public house, club, etc. service	2.1511 (0.4351)	0.5279 (0.9704)	-0.0036 (0.0010)	0.8166	0.7367	12.8
Laundry and dry-cleaning service	2.9857 (0.1899)	0.3506 (0.0423)	-0.0007 (0.0004)	0.8645	1.1430	6.4

CHAPTER 8

CONCLUSIONS

It is difficult to draw very many clear and unqualified conclusions from the foregoing chapters. The analysis has been selective but, even so, it has been more superficial than is desirable. Thus one important conclusion is that there is a need for further work in the area before a full picture of the many facets of the labour market can be fully understood. It is suggested that such investigation could fruitfully follow the approach here which is to measure, quantify and test key relationships rather than use the data to selectively illustrate qualitative and descriptive arguments. The conclusions drawn at this stage are, therefore, in the nature of an interim report and will be kept accordingly short.

Chapters 2 and 3 focused on the labour market before 1914. The period was one of gradual structural change with a regular pattern of cyclical fluctuations. This pattern is faithfully reflected in the Trade Union unemployment series which show no secular trend and which, despite doubts about its representative nature and usefulness as a measure of the total volume of unemployment appears to be a very sensitive indicator of changes in labour market conditions. The growth in wages relative to the cost of living index delineates three phases in the rate of improvement of working class standards. These trends and the year to year variations were largely the result of competitive forces which, though producing standards considerably above subsistence for those in the 'primary' labour market, left many of those least able to compete in a condition of abject poverty.

During a period as long as 60 years one might have expected important changes in the structure and functioning of the labour market to have taken place. In a recent article, Tarling and Wilkinson have argued that the growth of real and nominal wages before 1914 must be seen in the context of the evolution of political and institutional forces and that concentration on pure market forces is empty and dangerous (1982, p. 23). Considerable attention was paid in Chapter 2 to the structure and institutional features of the labour market and the evidence appears to point in the opposite direction. Real wages grow most slowly when labour's bargaining power, superficially at least, appears to have been strongest. Adjustments of wages, hours and conditions took place where they were most called for by competitive forces and it was the differing combinations of economic forces which called forthe the emergence of different degrees of organisation and different forms of collective bargaining. Of themselves these did little to alter the economic effects of short term changes or to alter the course of long run growth and structural change.

If this view is appropriate, then modern neoclassical models of the competitive labour market might be expected to receive support. The examination of the time series labour supply function for this period has a wider importance in view of the Phillips curve literature whose empirical support derives originally from the period. The single equation model of the inverted Phillips curve receives considerable support from the data: it indicates a stable relatinnship over the whole period to 1914 and provides a simple rationale for the dynamics of wage change and unemployment which, as represented by the loops around the Phillips curve, had left an unresolved puzzle. Further support for the relationship emerges when the data is disaggregated into individual unions, though the inadequacy of the data still imposes reservations. These are particularly acute when attempts are made to assess the quantitative

significance of of trade union policies of providing out of work benefits. All that can usefully be said about this is that at least these are more appropriate tests of such influences than those previously performed.

When labour supply and demand functions are estimated jointly, they lend support to the view that wages and unemployment can be seen as the outcome of a process of short run labour market clearing. The independent effect of the cost of living index on the wage and employment disappears in the simultaneous model which suggests it may have been acting as a proxy for factors determining demand in the single equation model. The fact that price change appears not to enter the labour supply function lends support to the approach of Lucas (1973) rather than that of Lucas and Rapping (1969).

In view of these results, it is interesting to perform some of the tests of a classical model of the labour market suggested by Sargent (1973, 1976) in which the Lucas supply function and rational expectations are used. The assumptions required are stringent: in addition to an unimpeded competitive labour market, a stable process generating wage and employment variations must be assumed. In addition, Hall (1980) has argued that the Lucas supply function is only appropriate if only local information is available and current aggregate wage and price changes are not publicly announced. These conditions are largely satisfied for the period before 1914 and the tests appear to support Sargent's model rather more strongly than Sargent's own tests for the postwar U.S. economy.

If this view of the functioning of the pre-war labour market is accepted, it is important to focus on changes in the economic and institutional structure occurring between the decade before the war and the 1920s. These changes provide at least some insights into the problems which beset the interwar economy. Principal among these is the structural

readjustment which was called for by the new trading conditions facing the British economy after the war and which were substantially greater than those which were faced before 1914. At the same time, particularly as a result of new attitudes as to the place of labour in the economy developed during the war, new institutions emerged which may have made adjustment more difficult. The emergence of centralised collective bargaining in almost every sector sanctioned and supported by the state and the new criteria established of comparability with living costs and wages in other sectors tended to institutionalise relative wage rigidity. This is not to say that these institutions were undesirable - it is possible that, if left entirely unimpeded, the free reign of market forces might have imposed great cost on sections of society, considerably greater than anything actually observed in the interwar period.

One important factor in ameliorating distress was the protection against utter destitution and poverty afforded by the national insurance system. That such a system which had its origins in the liberal reforms before the war, became widely extended in 1920 and 1921 must be regarded as one of the more fortunate aspects of labour history. Though the system of unemployment benefits probably prevented a great deal of distress from poverty which might otherwise have occurred , it was not as magnanimous as has been suggested by Benjamin and Kochin (1979) and was by no means successful in eradicating poverty.

Nevertheless, it is possible that by altering the structure of labour market incentives, the unemployment insurance system may have impeded adjustment and fostered persistent high unemployment. The view that high interwar unemployment is largely a statistical artifact cannot be sustained. On any realistic comparison, interwar unemployment was of a completely different order of magnitude than that in the early

postwar period or that before 1914. On the other hand, differences in the benefit to wage ratio between these different periods do not provide support for the view that such differences can be explained by the benefit regime.

On these observations and an examination of the structure and character of interwar unemployment, the conclusion that the period was characterised by persistent involuntary unemployment or labour market excess supply seems fully warranted. In this context, the model used by Benjamin and Kochin to measure the effects of unemployment benefits is inappropriate and must be rejected. Though the single equation model used could be given more than one interpretation, it is clear from the way it was used and interpreted that it was viewed as an equilibrium model (see Appendix 5A.1). In this interpretation, the model only picks up the part of benefit induced unemployment which arises from expanding the insured labour force and not the effect on employment of altering the equilibrium wage. However, in the context of a model where an equation for employment is estimated separately, the impact of the benefit to wage ratio seems to have reduced employment for a given level of output, rather than to have raised the apparent labour supply or insured labour force. Efforts to measure the impact of benefits on the level of and changes in the wage rate yielded negative results. This evidence is difficult to interpret and, hence, further investigation was pursued at the disaggregated level.

The results for industry employment function give strong support to the excess supply view of the labour market since adjustment of employment to output was very rapid but the widespread finding of increasing short run returns to labour was consistently supported. The results for benefits obtained for aggregate employment also receive support at the industry level: the benefit to wage ratio shifted employment for a given output level though

the estimated effects vary widely between industries. These effects largely disappear when unconstrained labour demand equations are estimated. The results, in general, indicate that it is difficult to separate out the individual effects of output, wages, prices and benefits on annual data and the wide range of results in other studies supports this.

It was felt that more precise estimates of the effects of benefits might be obtained from quarterly data which have not previously been used in this discussion. The results for employment in Chapter 6 suggest that a first differences formulation is appropriate and, in a model which yielded significant coefficients, both on the product wage and output, no effect for unemployment benefits could be discerned. An examination of the flow of workers out of insurance indicated that this was affected by both changes in the benefits to wage ratio and rates of disallowance with the predicted signs and that these effects can be discerned in an equation for quarterly changes in the insured labour force. These results appear to accord more closely with what would have been predicted in most labour market models.

It was originally thought that the effect of benefits on employment found in annual data might be connected with firms adopting a policy of temporary layoffs to give their workers a combination of income from employment and benefits. This would maintain their eligibility for benefits and retain a pool of labour for immediate recall. Equations for the temporarily stopped and wholly unemployed yielded results which were largely consistent with the equations for employment but failed to produce coefficients on the benefit to wage ratio, the disallowance rate and the demographic variable which were obtained in the labour force equations.

Disaggregating by sex and into juveniles and adults does little to improve on these results. Ironically, the only equations in which significant coefficients are obtained on the benefit to wage ratio are in equations for juveniles. This was the group for which Benjamin and Kochin claimed that the benefit to wage ratio was too low to have significantly affected unemployment. In the quarterly model, however, the effect of benefits appears to have been to raise the number temporarily stopped and reduce those wholly unemployed.

If the paradigm of non market clearing is appropriate for the interwar period, then this automatically raises the issue of how demand management policies might have been used to reduce unemployment. It has been argued that the philosophy and traditions of public finance were deeply rooted and provided an overwhelming resistance to Keynesian ideas (Middleton 1982). However, it is still valid to consider the implications of such policies even though they were not used. Serious proposals were put forward by Lloyd George and Keynes amongst others, for reflationary policies and the possible impact of such policies has been widely considered.

Recent writers have stressed that such policies would not have been feasible because the employment creating impact of public spending programmes would have been small. These views are largely based on pessimistic conclusions about the size of the sample expenditure multiplier (Glynn and Howells, 1980, Thomas, 1981). However, apart from any misgivings about the propensities used in generating these results, two important features have been glossed over. One is that fiscal stance was such that any stimulus to demand would have a considerable effect on exchequer revenues which would reduce the borrowing

requirement of a given spending programme. The other is that in such an open economy it is necessary to consider public spending and exchange rate policy together. In the 1920s, a policy of devaluation could have provided scope for the expansion of public spending while, in the 1930's, public spending would have helped keep the exchange rate low. The importance of exchange rate policy is not just that it would ease the budget deficit required by expansionary policies but, also, that it would direct additional demand into the depressed exporting areas.

How far the "regional problem" would have imposed constraints on possible reflationary policies depends not only on the extent to which additional demand would have flowed into depressed industries and areas but on the ease with which resources could be reallocated. In the accounting context of shift share analysis, unemployment was both regional and industrial but it appears that the decline of major industries tended to impose high unemployment on other industries in a region. But in general, those industries and regions with high unemployment rates grew proportionately more than average during times of general expansion. Thus, even if demand expansion were largely domestic in origin, it is likely that employment would have grown faster in the depressed regions.

Furthermore, the evidence suggests that there were not areas and industries with significant excess demand for labour which were held back by the industrial and regional maldistribution of the labour force. Low geographical mobility was due to the fact that the prospects for immigrant labour were poor even in the relatively prosperous areas. These observations suggest that selective regional policies would not have been particularly effective in the absence of a general demand

reflation. The indication that regional multipliers were relatively low strengthens this point and supports the view that domestic demand expansion, together with the appropriate exchange rate policy could have resulted in significantly higher levels of employment than those actually achieved.

BIBLIOGRAPHY

Aldcroft D.H. (1966) "Economic Progress in Britain in the 1920s" reprinted in Aldcroft, D.H. and Richardson, H.W. (1969) The British Economy 1870-1939, London: Macmillan.

Aldcroft, D.H. (1967) "Economic Growth in the Inter-War Years: A Reassessment", reprinted in Aldcroft, D.H. and Fearon, P. (1969) Economic Growth in 20th Century Britain, London: Macmillan.

Aldcroft, D.H. (1970) The Interwar Economy: Britain 1919-1939, London: Batsford.

Aldcroft, D.H. and Fearon, P. (eds.) (1972) British Economic Fluctuation 1790-1939, London: Macmillan

Alford, B.W.E. (1972) Depression and Recovery? British Economic Growth 1918-1939, London: Macmillan.

Allen, R.D.G. and Thomas, B. (1939) "The Supply of Engineering Labour under Boom Conditions", Economic Journal, vol. 49, pp. 259-274.

Altonji, J and Ashenfelter, O. (1980) "Wage Movements and the Labour Market Equilibrium Hypothesis", Economica, vol. 47, pp. 217-245.

Archibald, G.C., Kemmis, R. and Perkins, J.W. (1974) "Excess Demand for Labour, Unemployment and the Phillips Curve: A Theoretical and Empirical Study" in Laidler, D. and Purdy, D. (eds.) Inflation and Labour Markets, Manchester: University Press.

Baily, M.N. (1977) "On the Theory of Temporary Layoffs and Unemployment", Econometrica, vol. 45, pp. 1043-1063.

Bain, G.S. (1970) The Growth of White-Collar Unionism, Oxford: Clarendon Press.

Bain, G.S. and Elshiek, F. (1976) Union Growth and the Business Cycle, Oxford: Blackwell.

Bain, G.S. and Elshiek, F. (1982) "Union Growth and the Business Cycle: a Disaggregated Study", British Journal of Industrial Relations, vol. 20, pp. 34-43.

Baines, D. (1981) "Labour Supply and the Labour Market 1860-1914", in Floud, R. and McCloskey, D.N. (eds.), The Economic History of Britain since 1700, Cambridge: University Press.

Bakke, E.W. (1933) — The Unemployed Man, London: Nisbet.

Ball, R.J. and St. Cyr, E.B.A. (1966) — "Short Term Employment Functions in British Manufacturing Industry", Review of Economic Studies, vol. 33, pp. 179-707.

Barrett, C.R. and Walters, A.A. (1966) — "The Stability of Keynesian and Monetary Multipliers in the United Kingsom", Review of Economics and Statistics, vol. 48, pp. 395-405.

Barro, Robert, J. (1976) — "Rational Expectations and the Role of Monetary Policy", Journal of Monetary Economics, vol. 2, pp. 1-32.

Barro, R. and Grossman, H. (1976) — Money Employment and Inflation, Cambridge: University Press.

Batchelor, R.A. and Sheriff, T.D. (1979) — "Unemployment and Unanticipated Inflation in Postwar Britain", Economica, 47, pp. 179-192.

Bean, R. and Peel, D.A. (1976) — "Business Activity, Labour Organisation and Industrial Disputes in the U.K. 1892-1938", Business History, vol. 18, pp.

Beck, G.M. (1952) — A Survey of British Employment and Unemployment, 1927-1945, Oxford:

Benassy, J-P. (1977) — "A Neo-Keynesian Model of Price and Quantity Determination in Disequilibrium", in Schwödiaur, G. (ed.) Equilibrium and Disequilibrium in Economic Theory, Dordrecht: Radel.

Benjamin, D.K. and Kochin, L.A. (1979) — "Searching for an Explanation of Unemployment in Interwar Britain", Journal of Political Economy vol. 87, pp. 441-478.

Benjamin, D.K. and Kochin, L.A. (1982) — "Unemployment and Unemployment Benefits in Twentieth Century Britain: a Reply to our Critics", Journal of Political Economy, vol. 90, pp. 410-436.

Beveridge, W. H. (1930) — Unemployment: a Problem of Industry, London: Longmans Green.

Beveridge, W.H. (1936-7) — "An Analysis of Unemployment", Economica, vol. 4 pp. 357-386; vol. 5, pp. 1-17, pp. 168-183.

Beveridge, W.H. (1944) — Full Employment in a Free Society, London: George Allen and Unwin.

Bienefeld, M.A. (1972) — Working Hours in British Industry: an Economic History, London: Weidenfeld and Nicholson.

Board of Trade (1901) — Report on Changes in Wages and Hours of Labour, London: H.M.S.O.

Board of Trade (Labour Department) (1893, 1912) — Report on Trade Unions, 1891, Cd. 6990, 1908-1910, Cd. 6109, London: H.M.S.O.

Board of Trade (1905) — British and Foreign Trade and Industrial Conditions, (2nd. series) 1904. London: H.M.S.O

Board of Trade (Labour Department) (1910) — Report on Collective Agreements between Employers and Workpeople in the United Kingdom, Cd. 5366, London: H.M.S.O.

Bodkin, G. (1969) — "Real Wages and Cyclical Variations in Employment: a Re-examination of the Evidence", Canadian Journal of Economics, vol. 2, pp. 353-374.

Booth, A.E. and Glynn, S. (1975) — "Unemployment in the Interwar Period: a Multiple Problem", Journal of Contemporary History, vol. 10, pp. 611-637.

Booth, C. (1892) — Life and Labour of the People in London, London: Macmillan.

Bowley, A.L. and Wood, G.H. (1898-1906) — "The Statistics of Wages in the United Kingdom during the Last Hundred Years", Parts 1-14, Journal of the Royal Statistical Society, vols. 61-69.

Bowley, A.L. (1912) — "The Measurement of Employment: an Experiment" Journal of the Royal Statistical Society, vol. 75, pp.

Bowley, A.L. (1912) — "Earners and Dependents in English Towns in 1911", Economica, vol. 6, pp. 101-112.

Bowley, A.L. (1937) — Wages and Income in the United Kingdom since 1860, Cambridge: University Press.

Bowley, A.L. and Burnett-Hurst, A.R. (1915) — Livelihood and Poverty, London: G.Bell and Sons.

Branson, N. and Heinemann, M. (1973) — Britain in the Nineteen Thirties, St. Albans: Panther.

Brechling, F.P.R. (1965) — "The Relationship between Output and Employment in British Manufacturing Industries", Review of Economic Studies, vol. 32, pp. 187-286.

Brechling, F.P.R. (1967) — "Trends and Cycles in Regional Unemployment", Oxford Economic Papers, vol. 19, pp. 1-20.

Briscoe, G. and Peel, D.A. (1974) — "The Value of Inter-Related Factor Demand Models for Explaining Short Term Employment Behaviour in the U.K.Manufacturing Sector", University of Warwick: Centre for Industrial and Business Research Discussion Paper No. 52.

Briscoe, G. and Peel, D.A. (1975) "The Specification of the Short-Run Employment Function", Oxford Bulletin of Economics and Statistics, vol. 37, pp.115-142

Briscoe, G. and Roberts, C.J. (1975) "Structural Breaks in Employment Functions for U.K. Production Industries 1954-1973" University of Warwick: Centre for Industrial and Business Research Discussion Paper No. 64.

Brown, A.J. (1972) The Framework of Regional Economics in the United Kingdom, Cambridge: University Press.

Burgess, K. (1975) The Origins of British Industrial Relations, London: Croom Helm.

Burkitt, B. (1974) "The Relationship between Earnings and Unionisation in the Interwar Years", Applied Economics, vol. 6, pp. 83-93.

Burkitt, B. and Bowers, D. (1978) "The Determination of the Rate of Change of Unionisation in the United Kingdom, 1924-1966", Applied Economics, vol. 10, pp. 161-172.

Burns, E.M. (1941) British Unemployment Programs 1920-1938 Washington: Social Science Research Council.

Buxton, N.K. (1975) "The Role of the 'New' Industries in Britain during the 1930s: a Reinterpretation", Business History Review, vol. 44, pp. 205-222.

Cairncross, A.K. (1953) Home and Foreign Investment 1870-1913: Studies in Capital Accumulation, Cambridge: University Press.

Casson, M (1981) Unemployment: A Disequilibrium Approach. London: Martin Robertson.

Champernowne, D.G. (1938-9) "The Uneven Distribution of Unemployment in the United Kingdom, 1929-36", Review of Economic Studies, vol. 5, pp. 93-106, vol. 6, pp. 111-123 and "The Main Cause of Variation of the Unemployment Percentage between Industries - a Correction", vol. 6, pp. 125-6.

Chapman, A. L. (1953) Wages and Salaries in the United Kingdom, 1920-1938. Cambridge: University Press.

Chapman, S.J. (1899) "The Regulation of Wages in the Spinning Industry", Economic Journal, vol. 9, pp. 592-599.

Chapman, S.J. (1908) — Work and Wages vol. 2, London: Longmans Green.

Chapman, S.J. and Hallsworth, H.M. (1909) — Unemployment: the Results of an Investigation made in Lancashire. Manchester: University Press.

Church, R.A. (1975) — The Great Victorian Boom 1850-1873, London: Macmillan.

Clay, H. (1927) — The Post-War Unemployment Problem, London: Macmillan.

Clay, H. (1928) — "Unemployment and Wage Rates", Economic Journal, Vol. 38, pp. 1-13.

Clay, H. (1929) — The Problem of Industrial Relations, London: Macmillan.

Clegg, H.A. (1954) — "Some Consequences of the General Strike", Transactions of the Manchester Statistical Society, pp. 1-29.

Clegg, H.A. (1976) — The System of Industrial Relations in Great Britain, Oxford: Blackwell.

Clegg. H.A., Fox, A. and Thompson, A.F. (1964) — A History of British Trade Unions since 1889, vol. 1. Oxford: Clarendon Press.

Collins, M. (1982) — "Unemployment in Interwar Britain: Still Searching for an Explanation", Journal of Political Economy, vol. 90, pp. 369-379.

Constantine, S. (1980) — Unemployment in Britain between the Wars, London: Longman.

Corner, D.C. (1956) — "Exports and the British Trade Cycle: 1929" Manchester School, vol. 24, pp. 124-160.

Creedy, J. (ed.) (1981) — The Economics of Unemployment in Britain, London: Butterworths.

Cripps, T.F. and Tarling, R.J. (1974) — "An Analysis of the Duration of Male Unemployment in Great Britain 1932-73) Economic Journal, vol. 84, pp. 284-316.

Cronin, J.E. (1979) — Industrial Conflict in Modern Britain, London: Croom Helm.

Cross, R. (1982) — "How Much Voluntary Unemployment in Interwar Britain?" Journal of Political Economy, vol. 90, pp. 380-385.

Crossick, G. (1976) — "The Labour Aristocracy and its Values: a Study of Mid-Victorian Kentish London", Victorian Studies, vol. 19, pp. 301-328.

Crossley, J.R. (1966) "Collective Bargaining, Wage Structure and Labour in the United Kingdom" in Hugh-Jones, E.M. (ed.) Wage Structure in Theory and Practice, Amsterdam: North Holland.

Crouzet, F. (1982) The Victorian Economy, London: Methuen

Dangerfield, G. (1935) The Strange Death of Liberal England, New York: Perigree edn. (1980).

Daniel, G.H. (1939) "Some Factors Affecting the Mobility of Labour", Oxford Economic Papers, vol. 2, pp. 144-179.

Davison, R.C. (1938) British Unemployment Policy since 1930, London: Longmans Green.

Deacon, A.J. (1976) In Search of the Scrounger: the Administration of Unemployment Insurance in Britain 1920-1931, London: Bell and Sons.

Deacon, A.J. (1977) "Concession and Coercion: the Politics of Unemployment Insurance in the Twenties", Ch. 1. in Briggs, A. and Saville, J. (eds.) Essays in Labour History, London: Croom Helm.

Deane, P. and Cole, W.A. (1962) British Economic Growth 1688-1959 (2nd edn.) Cambridge: University Press.

Dennison, S.R. (1939) The Location of Industry and the Depressed Areas, London: Oxford University Press.

Desai, M. (1975) "The Phillips Curve: a Revisionist Interpretation", Economica, vol. 42, pp. 2-19.

Dhrymes, P.J. (1969) "A Model of Short Run Labour Adjustment" in Duesenberry, J.S., Fromm, G., Klein, L.R. and Kuh, E. (eds.) The Brookings Model: Some Further Results, New York: North Holland.

Dixon, R.J. and Thirwall, A.P. (1975) Regional Growth and Unemployment in the United Kingdom, London: Macmillan.

Dogas, D. and Hines, A.G. (1975) "Trade Unions and Wage Inflation in the U.K: a Critique of Purdy and Zis", Applied Economics vol. 7, pp. 195-211.

Dowie, J.A. (1968) "Growth in the Interwar Period: Some More Arithmetic", reprinted in Aldcroft, D.H. and Fearon, P. (1969) (eds.) Economic Growth in 20th Century Britain, London: Macmillan.

Duffy, A.E.P. (1962) "New Unionism in Britain 1899-1890: a Reappraisal", Economic History Review, vol.14, pp. 306-319.

Dunlop, J.T. (1938) "The Movement of Real and Money Wage Rates" Economic Journal, vol. 48, pp. 413-434.

Easton, S.T. (1978, 1979) "Aggregate Aspects of the Poor Law, Unemployment Insurance and Unemployment in Britain, 1855-1940", Unpublished Ph.D. Dissertation: University of Chicago. Summary in Journal of Economic History, vol. 39, pp. 326-329.

Feinstein, C.H. (1965) Domestic Capital Formation in the United Kingdom, 1920-1938, Cambridge: University Press.

Feinstein, C.H. (1972) National Income Expenditure and Output of the United Kingdom, 1855-1965, Cambridge: University Press.

Feldstein, M. (1976) "Temporary Layoffs in the Theory of Unemployment", Journal of Political Economy, vol. 84, pp. 937-957.

Feldstein, M. (1978) "The Effect of Unemployment Insurance on Temporary Layoff Unemployment", American Economic Review, vol. 18, pp. 834-846.

Fels, A. and van Hoa, T. (1981) "Causal Relationships in Australian Wage Inflation and Minimum Award Rates", Economic Record, vol. 57, pp. 23-34.

Fisher, I. (1925) "Our Unstable Dollar and the So-Called Business Cycle", Journal of the American Statistical Association, vol. 20, pp.179-202.

Fisher, I. (1926) "A Statistical Relation between Unemployment and Price Changes", in International Labour Review, vol. 13, pp. 785-792. Reprinted as "I Discovered the Phillips Curve", Journal of Political Economy, vol. 81, pp. 496-502.

Flanders, A. (1963) "Collective Bargaining" in Flanders, A and Clegg, H.A. (eds.) Industrial Relations in Great Britain, Oxford: Blackwell.

Floud, R. and McCloskey, D.N. (es.) (1981) The Economic History of Britain since 1700, Cambridge: University Press.

Fogarty, M.P. (1945) Prospects of the Industrial Areas of Great Britain, Methuen: London.

Fogel, R. (1967) "The Specification Problem in Economic History" Journal of Economic History, Vol. 27, pp. 283-308.

Ford, A.G. (1963) "Notes on the Role of Exports in British Economic Fluctuations, 1870-1914", Economic History Review, vol. 16, pp. 328-337.

Ford, A.G. (1965) "Overseas Lending and Internal Fluctuations: 1870-1914", Yorkshire Bulletin of Economic and Social Research, vol. 17, pp. 19-31.

Ford, A.G. (1969) "British Economic Fluctuations, 1870-1914" Manchester School, vol. 37, pp. 99-129.

Friedman, M. and Meiselman, D. (1963) "The Relative Stability of Monetary Velocity and the Investment Multiplier in the United States 1897-1958" in U.S.Monetary Commission Stabilisation Policies, Englewood Cliffs, N.J.: Prentice Hall.

Galenson, W. and Zellner, A. (1957) "International Comparison of Unemployment Rates" in N.B.E.R. The Measurement and Comparison of Unemployment Rates, Princeton: University Press.

Garraty, J.A. (1978) Unemployment in History, New York: Harper and Row.

Garside, W.R. (1980) The Measurement of Unemployment, Oxford: Blackwell.

Gilbert, B.B. (1966) The Evolution of National Insurance in Great Britain, London: Michael Joseph.

Gilbert, B.B. (1970) British Social Policy 1914-1939, London: Batsford.

Gilbert, C.L. (1976) "The Original Phillips Curve Estimates" Economica, vol. 43, pp. 51-57.

Glynn, S. and Oxborrow, J. (1976) Interwar Britain: a Social and Economic History. London: George Allen and Unwin.

Glynn, S and Howells, P.G.A. (1980) "Unemployment in the 1930's: the Keynesian Solution Reconsidered", Australian Economic History Review, vol. 20, pp. 28-45.

Gordon, I. (1979) "Regional Unemployment Elasticities: the Neglected Role of Migration", Scottish Journal of Political Economy, vol. 26, pp. 97-106.

Gosden, P.H.J.H. (1973) Self Help: Voluntary Associations in the Nineteenth Century, London: Batsford.

Granger, C.W.J. (1969) "Investigating Causal Relations by Econometric Methods and Cross-Spectral Methods", Econometrica, vol. 37, pp. 424-438.

Greer, D.F. and Rhoades, S.A. (1977) "A Test of the Labour Reserve Hypothesis", Economic Journal, vol. 87, pp. 290-299.

Hall, R.E. (1980) "Labor Supply and Aggregate Fluctuations", Journal of Monetary Economics, vol. 12, pp. 7-33

Hansen, B. (1970) "Excess Demand, Unemployment, Vacancies and Wages", Quarterly Journal of Economics, vol. 84, pp. 1-23.

Harris, J. (1972) Unemployment and Politics: a Study in English Social Policy 1886-1914. Oxford: Clarendon Press.

Harrison, A and Hart, R. (1982) "A Labour Market Model of Unemployment Insurance", (Unpublished).

Hart, R.A. and Sharot, T. (1978) "The Short-Run Demand for Workers and Hours: a Recursive Model", Review of Economic Studies, vol. 45, pp. 299-309.

Hartley, B.A. (1904) "Trade Union Expenditure on Unemployed Benefit", Journal of the Royal Statistical Society, vol. 67, pp. 52-71.

Hazeldine, T. (1978) "New Specifications for Employment and Hours Functions", Economica, vol. 78, pp. 179-193.

Hazeldine, T. (1981) "'Employment Functions' and the Demand for Labour in the Short Run", in Hornstein, Z., Grice, J. and Webb, A. (eds.) The Economics of the Labour Market, London: H.M.S.O.

Hicks, J.R. (1930) "An Early History of Industrial Conciliation in England", Economica, vol. 10. pp. 25-39.

Hicks, J.R. (1974) "Real and Monetary Factors in Economic Fluctuations", Scottish Journal of Political Economy, vol. 21, pp. 205-214.

Hill, J.R. and Lubin, I. (1934) The British Attack on Unemployment, Washington: Brookings Institute.

Hilton, J. (1923) "Statistics of Unemployment Derived from the Working of the Unemployment Insurance Acts", Journal of the Royal Statistical Society, vol. 46, pp. 154-193.

Hines, A.G. (1964) "Trade Unions and Wage Inflation in the United Kingdom 1893-1961", Review of Economic Studies, vol. 31, pp. 221-252.

Hinton, J. (1973) The First Shop Stewards Movement, London: George Allen and Unwin.

Hobsbawm, E.J. (1964) Labouring Men, London: Weidenfeld and Nicholson.

Holden, K. and Peel, D.A. (1976) "The Shakeout Hypothesis: a Note", Bulletin of the Oxford Institute of Statistics and Economics, vol. 38, pp. 141-148.

Holden, K. and Peel, D.A. (1977) "Unemployment and Unanticipated Inflation: Some Empirical Results for Six Countries", European Economic Review, vol. 10, pp. 253-271.

Holt, C.C. and David, P. (1966) "The Concept of Job Vacancies in a Dynamic Theory of the Labour Market", in N.B.E.R. The Measurement and Interpretation of Job Vacancies, New York: N.B.E.R.

Howson, S. (1975) Domestic Monetary Management in Britain 1919-1938, Cambridge: University Press.

Howson, S. (1980) "The Management of Sterling, 1932-1939", Journal of Economic History, vol. 40, pp. 53-60.

Howson, S. (1981) "Slump and Unemployment", Chapter 11 in Floud, R. and McCloskey, D.N. (eds.) The Economic History of Britain since 1700, vol. 2 pp. 265-285. Cambridge: University Press.

Huffman, E. and Lothian, J.R. (1980) "Money in the United Kingdom, 1833-80", Money, Credit and Banking, vol. 12, pp. 155-173.

Hughes, B. (1971) "Supply Constraints and Short-term Employment Functions: a Comment", Review of Economics and Statistics, vol. 53, pp. 393-397.

Hunt, E.H. (1973) Regional Wage Variations in Britain 1850-1914 Oxford: Clarendon Press.

Hunt, E.H. (1981) British Labour History 1815-1914, London: Weidenfeld and Nicholson.

Hutt, A. (1975) British Trade Unionism (Sixth edn.) London: Lawrence and Wishart.

Imlah, A.H. (1958) Economic Element in the Pax Britannica, Cambridge Mass. : Harvard University Press.

Ireland, N.J. and Smythe, D.J. (1970) "The Specification of Short Run Employment Models", Review of Economic Studies, vol. 37 pp. 281-285.

Irish, M. (1980) "Unemployment in Interwar Britain: a Note", University of Bristol: Unpublished.

Irish, M. and Winter, D. (1981) "Did the Aggregate Market for Labour Clear in Interwar Britain: Some Econometric Evidence", University of Bristol: unpublished.

Jewkes, J. and S. (1938) The Juvenile Labour Market, London: Gollancz.

Jonson, P.D. (1976) "Money and Economic Activity in the Open Economy 1880-1970", Journal of Political Economy, vol. 84, pp. 979-1012.

Kohn , A.E. (1946) Great Britain in the World Economy, New York: Columbia University Press.

Kaldor, N. (1959) "Economic Growth and the Problem of Inflation", parts I and II. Economica, vol. 36, pp. 212-226 and 287-298.

Keynes, J.M. (1931) "The Economic Consequences of Mr Churchill", reprinted in Pollard, S. (ed.) (1970) The Gold Standard and Employment Policies Between the Wars, London: Methuen.

Keynes, J.M. (1936) The General Theory of Employment, Interest and Money, London: Macmillan.

Keynes, J.M. (1939) "Relative Movements of Real Wages and Output", Economic Journal, vol. 49, pp. 34-51.

Knight, K.G. and Wilson, R.A. (1974) "Labour Hoarding, Employment and Unemployment in British Manufacturing Industry", Applied Economics, vol. 6, pp. 303-310.

Knowles, K.C.J.C. and Robertson, D.J. (1951) "Differences between the Wages of Skilled and Unskilled Workers, 1880-1950", Bulletin of the Oxford Institute of Statistics, vol. 13, pp. 109-127.

Knowles, K.G.J.C. and Winsten, C.B. (1959) "Can the Level of Unemployment Explain Changes in Wages?", Bulletin of the Oxford Institute of Statistics, vol. 21, pp. 113-120.

Lawrence, E.W. (1899) — Local Variations in Wages, London: Longmans Green.

League of Nations (1939) — Review of World Trade, 1938, Geneva.

Leser, C.E.V. and Silvey, A. (1950) — "Scottish Industries during the Interwar Period", Manchester School, vol. 18, pp. 163-174.

Lewis, W.A. (1952) — "World Production, Prices and Trade, 1870-1950", Manchester School, vol. 20, pp. 105-138.

Lipsey, R.G. (1960) — "The Relation between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom, 1862-1957: A Further Analysis", Economica, vol. 27, pp. 1-31.

Lipsey, R.G. and Steuer, M.D. (1961) — "The Relation between Profits and Wage Rates" Economica, vol. 28, pp. 137-155.

Lomax, K.S. (1964) — "Growth and Productivity in the United Kingdom" reprinted in Aldcroft, D.H. and Fearon, P. (1969) (eds.) Economic Growth in Twentieth Century Britain, London: Macmillan.

Lothian, J.R. (1976) — "Interwar Britain: a Comparison with American Experience", unpublished.

Lovell, J. (1977) — British Trade Unions 1875-1933, London: Macmillan.

Lucas, R.E. Jr. & Rapping, L.A. (1969) — "Real Wages, Employment and Inflation" Journal of Political Economy, vol. 77, pp. 721-749.

Lucas, R.E. Jr. (1973) — "Some International Evidence on Output-Inflation Tradeoffs", American Economic Review, vol. 63, pp. 326-334.

McCall, J.J. (1970) — "The Economics of Information and Job Search' Quarterly Journal of Economics, vol. 84, pp. 113-126.

McCloskey, D.N. and Zeder, R. (1976) — "How the Gold Standard Worked 1880-1913", in Frenkel, J.A. and Johnson, H.G. (eds.) The Monetary Approach to the Balance of Payments, London: George Allen and Unwin.

McCloskey, D.N. (1978) "The Achievements of the Cliometric School", Journal of Economic History, vol. 38, pp. 13-28.

McCrone, G. (1969) Regional Policy in Britain, London: George Allen and Unwin.

Mackay, D.I. (1968) "Industrial Structure and Regional Growth: a Methodological Problem", Scottish Journal of Political Economy. vol. 15, pp. 129-143.

Maizels, A. (1963) Industrial Growth and World Trade, Cambridge: University Press.

Maki, D. and Spindler, Z.A. (1975) "The Effects of Unemployment Compensation on Unemployment in Great Britain". Oxford Economic Papers, vol. 27, pp. 440-454.

Maki, D. and Spindler, Z.A. (1979) "More on the Effects of Unemployment Compensation on the Rate of Unemployment in Great Britain", Oxford Economic Papers, vol. 31 pp. 147-164.

Makower, H., Marshak, J., and Robinson, H.W. (1938) "Studies in the Mobility of Labour: a Tentative Statistical Measure", Oxford Economic Papers, vol. 1. pp. 83-123 and (1939 "Studies in the Mobility of Labour: Analysis for Great Britain, Part I", vol. 2, pp. 70-97.

Malinvaud, E. (1977) The Theory of Unemployment Reconsidered, Oxford: Blackwell.

Mathews, R.C.O. (1959) The Trade Cycle, Cambridge: Nisbet.

Mathews, R.C.O. (1964) "Some Aspects of Post-war Growth of the British Economy in Relation to Historical Experience" reprinted in Aldcroft, D.H. and Feoron, P. (eds.) (1969) Economic Growth in 20th Century Britain, London: Macmillan.

Mathews, K. and Minford, P. (1981) "Estimation of a Rational Expectations Model of the Interwar Period", University of Liverpool, unpublished.

Maywald, K. (1954) "An Index of Building Costs, 1845-1938", Economic History Review, vol. 7

Metcalf, D., Nickell, S.J. and Flores, N. (1980, 1982) "Still Searching for an Explanation of Unemployment in Interwar Britain", London School of Economics, Center for Labour Economics Discussion Paper, No. 71 and (revised) Journal of Political Economy, vol. 90, pp. 386-399.

Middleton, R. (1981) "Constant Employment Budget Balance and British Budgetary Policy 1929-39", Economic History Review, vol. 34, pp. 266-286.

Middleton, R. (1982) "The Treasury in the 1930's: Political and Administrative Constraints to Acceptance of the 'New Economics'", Oxford Economic Papers, vol. 34, pp. 48-77.

Miller, R.L.R. (1971) "The Reserve Labour Hypothesis: Some Tests of its Implications", Economic Journal vol. 81, pp. 17-35.

Mills, T.C. and Wood, G.E. (1978) "Money, Income Relationships and the Exchange Rate Regime", Federal Reserve Bank of St.Louis Review, vol. 60, pp. 22-27.

Minford, P. and Peel, D. (1980) "The Natural Rate Hypothesis and Rational Expectations - A Critique of some Recent Developments", Oxford Economic Papers, vol. 32, pp. 70-81.

Ministry of Labour Gazette, Various Issues, London: H.M.S.O.

Mitchell, B.R. and Deane, P. (1982) Abstract of British Historical Statistics, Cambridge: University Press.

Moggridge, D.E. (1979) The Return to Gold, 1925. The Formation of Economic Policy and its Critics, Cambridge: University Press.

Moggridge, D.E. (1972) British Monetary Policy 1924-1931, Cambridge: University Press.

Morgan, P.L. (1979) "Employment Functions in Manufacturing Industry", Government Economic Service Working Paper, No. 24.

Morris, J.H. and Williams, L.J. (1960) "The South Wales Sliding Scale, 1876-1879: an Experiment in Industrial Relations", Manchester School, vol. 28, pp. 161-176.

Mortenson, D.T. (1970) "Job Search, the Duration of Unemployment and the Phillips Curve", American Economic Review, vol. 60, pp. 847-861.

Mowat, C.L. (1955) Britain Between the Wars, 1918-1940, (revised edn., reprinted 1968). London: Methuen.

Musson, A.E. (1954) The Typographical Association, London: Oxford University Press.

Nadiri, M.I. and Rosen, S. (1969) "Interrelated Factor Demand Functions", American Economic Review, vol. 57, pp. 457-471.

Neftci, S.N. (1978) "A Time Series Analysis of the Real Wages-Employment Relationship", Journal of Political Economy, vol. 86, pp. 281-291.

Nerlove, M. (1965) "Two Models of the British Economy: a Fragment of a Critical Survey", International Economic Review, vol. 6, pp. 127-181.

Nevin, E. (1953) "The Origins of Cheap Money" reprinted in Pollard.S. (ed.) (1970). The Gold Standard and Employment Policies between the Wars. London: Methuen.

Nickell, S. (1980) "The Determinants of Equilibrium Unemployment in Britain", Economic Journal, vol. 92, pp. 555-575.

Nickell, S. (1980) "A Picture of Male Unemployment in Britain", Economic Journal, vol. 90, pp. 776-794.

Nickell, S. (1981) "An Investigation of the Determinants of Manufacturing Employment in the United Kingdom", London School of Economics: Centre for Labour Economics Discussion Paper No. 105.

Norris, K. (1979) "The Industrial Wage Structure in Great Britain", Economic Journal, vol. 89, pp. 370-376.

Oi, W. (1962) "Labour as a Quasi-Fixed Factor", Journal of Political Economy, vol. 70, pp. 538-555.

Okun, A.M. (1981) Prices and Quantities: a Macroeconomic Analysis. Oxford: Blackwell.

Ormerod, P.A. and Worswick, G.D.N. (1980, 1982) "Unemployment in Interwar Britain", National Institute of Economic and Social Research Discussion Paper and (revised version) Journal of Political Economy, vol. 90, pp. 400-409.

Parkin, M. (1978) "Alternative Explanations of United Kingdom Inflation: a Survey". in Parkin, M. and Sumner, M. (eds.) Inflation in the United Kingdom, Manchester: University Press.

Peden, G.C. (1981) "Keynes, the Treasury and Unemployment in the Later Nineteen-Thirties", Oxford Economic Papers, vol. 32, pp. 1-18.

Pederson, P.J. (1981) "Inflationary Effects of Unemployment Insurance - an International Survey" Institute of Economics, University of Aarhus. (Unpublished).

Peel, D.A. and Walker, I. (1978) "Short-Run Employment Functions, Excess Supply and the Speed of Adjustment: a Note", Economica, vol. 45, pp. 195-202.

Pelling, H. (1976) A History of British Trade Unionism (3rd edn.) Harmondsworth: Penguin.

Phelps, E.S. (ed.) (1970) — Microeconomic Foundations of Employment and Inflation Theory, London: Macmillan.

Phelps-Brown, E.H. and Browne, M. (1968) — A Century of Pay, London: Macmillan

Phelps-Brown, E.H. and Hopkins, S. (1955) — "Seven Centuries of Building Wages", Economica, vol. 22, pp. 195-206.

Phelps-Brown, E.H. and Shackle, G.L.S. (1939) — "British Economic Fluctuations 1924-38", Oxford Economic Papers, vol. 2, pp. 98-134.

Phillips, A.W. (1958) — "The Relation between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom", Economica, vol. 25, pp. 283-299.

Pigou, A.C. (1927) — Industrial Fluctuations, London: Macmillan.

Pigou, A.C. (1927) — "Wage Policy and Unemployment", Economic Journal, vol. 38, pp. 355-368.

Pigou, A.C. (1947) — Aspects of British Economic History 1918-1925, London: Macmillan.

Pilgrim Trust, Report made to (1938) — Men Without Work, Cambridge: University Press.

Pissarides, C.A. (1981) — "Contract Theory, Temporary Layoffs and Unemployment: a Critical Assessment" in Caine, D., Peel, D. and Peters, W. (eds.) Microeconomic Analysis (A.U.T.E., 1980) London: Croom Helm.

Pollard, S. (1965) — "Trade Unions and the Labour Market, 1870-1914", Yorkshire Bulletin of Social and Economic Research, vol. 12, pp. 98-112.

Pollard, S. (1969) — The Development of the British Economy 1914-1967 (2nd. edn.) London: Edward Arnold.

Pollard, S. (1970) — "Editor's Introduction" in The Gold Standard, Economic Policies between the Wars, London: Methuen.

Pollard, S. (1978) — "Labour in Great Britain", in Mathias, P. and Postan, M.M. (eds.), The Cambridge Economic History of Europe, Cambridge: University Press.

Porter, J.H. (1970) — "Wage Bargaining under Conciliation Agreements", Economic History Review, vol. 23, pp. 460-475.

Porter, J.H. (1971) — "Wage Determination by Selling Price: Sliding Scales 1870-1914", Manchester School, vol. 39, pp. 13-21.

Presnell, L.S. (1978) — "1925: The Burden of Sterling", Economic History Review, vol. 31, pp. 67-88.

Purdy, W.E.J. and Zis, G. (1973) — "Trade Unions and Wage Inflation in the U.K. : a Reappraisal", in Parkin, M. (ed.) Essays in Modern Economics, London: Longmans.

Redmond, J (1980) "An Indicator of the Effective Exchange Rate of the Pound in the Nineteen Thirties". Economic History Review Vol 33. pp 83-91.

Richardson, H.W. (1961, 1962, 1965) "The New Industries between the Wars", "The Basis of Economic Recovery in the 1930s", "Overcommitment in Britain before 1930", all reprinted in Aldcroft, D.H. and Richardson, H.W. (1969) The British Economy 1870-1939, London: Macmillan.

Richardson, H.W. (1967) Economic Recovery in Britain, 1932-9, London: Weidenfeld and Nicholson.

Richardson, H.W. (1972) "The Role of Consumption in Interwar Fluctuations" in Aldcroft, D.H. and Fearon, P. (eds.) British Economic Fluctuations 1790-1939, London: Macmillan.

Richardson, J.H. (1939) "Real Wage Movements", Economic Journal, vol. 49, pp. 423-441.

Rose, M.E. (1972) The Relief of Poverty 1834-1913, London:

Rosen, H.S. and Quandt, R.E. (1978) "Estimation of a Disequilibrium Aggregate Labor Market", Review of Economics and Statistics, vol. 60, pp. 371-379.

Rostow, W.W. (1948) British Economy of the Nineteenth Century, Oxford: Clarendon Press.

Routh, G. (1959) "The Relationship between Unemployment and the Rate of Change of Money Wage Rates: a Comment", Economica, vol. 26, pp. 299-315.

Routh, G. (1980) Occupation and Pay in Great Britain 1906-79 (2nd edn.) London: Macmillan.

Rowe, J.W.F. (1928) Wages in Practice and Theory, London: Routledge and Kegan Paul.

Rowntree, B.S. (1902) Poverty: a Study of Town Life (2nd edn.) London: Macmillan.

Rowntree, B.S. (1941) Poverty and Progress, London: Longmans Green.

Royal Commission on Trades Unions (1869) Final Report, Cd. 4123, London: H.M.S.O.

Royal Commission on Unemployment Insurance (1932) Minutes of Evidence, London: H.M.S.O.

Royal Commission on the Distribution of the Industrial Population (Barlow Commission) Cmnd. 6153 (1940), London: H.M.S.O.

Santomero, A.M. and Seater, J.J. (1978) "The Inflation-Unemployment Trade-off: a Critique of the Literature", Journal of Economic Literature, vol. 16, pp. 499-544.

Sapsford, D. (1975) "A Time Series Analysis of U.K. Industrial Disputes", Industrial Relations, vol. 14, pp. 242-249.

Sargent, T.J. (1973) "Rational Expectations, the Real Rate of Interest and the Natural Rate of Unemployment", Brookings Papers on Economic Activity, vol. 2, pp. 429-480.

Sargent, T.J. (1976a) "A Classical Macroeconometric Model for the United States", Journal of Political Economy vol. 84, pp. 207-237.

Sargent, T.J. (1978) "Estimating Dynamic Labour Demand Schedules under Rational Expectations", Journal of Political Economy, vol. 86, pp. 1009-1044.

Saul, S.B. (1969) The Myth of the Great Depression 1873-1896, London: Macmillan.

Sayers, R.S. (1957) "The Return to Gold, 1925", reprinted in Pollard, S. (ed.) (1970), The Gold Standard and Employment Policies between the Wars, London: Methuen.

Select Committee on Distress from want of Employment (1896) Report and Minutes of Evidence, House of Commons, 321/1896.

Sharpe, I.G. (1950) Industrial Conciliation and Arbitration in Great Britain, London: George Allen and Unwin.

Sheppard, D. (1971) The Growth and Role of U.K. Financial Institutions 1880-1962, London: Methuen.

Sims, C.A. (1972) "Money, Income and Causality", American Economic Review, vol. 62, pp. 540-552.

Singer, H.W. (1939) "Regional Labour Markets and the Process of Unemployment", Review of Economic Studies, vol. 7, pp. 42-58.

Smith, D. (1977) "A Monetary Model of the British Economy, 1880-1975", National Westminster Bank Quarterly Review, pp. 18-32.

Smythe, D.J. (1979) "Unemployment Dispersion and Phillip's Loops: a Direct Test of the Lipsey Hypothesis", Oxford Bulletin of Economics and Statistics, vol. 41, pp. 227-233.

Stedman-Jones, G. (1971) — Outcast London, Oxford: Clarendon Press.

Stern, J. (1982) — "Unemployment Inflow Rates for Autumn 1978" London School of Economics: Centre for Labour Economics Discussion Paper, No. 129.

Stigler, G.J. (1961) — "The Economics of Information", Journal of Political Economy, vol. 69, pp. 213-225.

Stigler, G.J. (1962) — "Information in the Labour Market", Journal of Political Economy, vol. 70, pp. 94-105.

Stoneman , P. (1979) — "A Simple Diagrammatic Apparatus for the Investigation of a Macroeconomic Model of Temporary Equilibria", Economica, vol. 46, pp. 61-66.

Stone, R. and Rowe, D.F. (1953) — The Measurement of Consumers' Expenditure and Behaviour in the United Kingdom, 1920-38, Vol. 1 Cambridge: University Press.

Symons, J.S.V. (1981) — "The Demand for Labour in British Manufacturing", London School of Economics: Discussion Paper No. 91.

Tarling, R. and Wilkinson, F. (1982) — "The Movement of Real Wages and the Development of Collective Bargaining in the U.K. 1855-1920", Contributions to Political Economy, vol. 1. pp. 1-23.

Tarshis, L. (1939) — "Changes in Real and Money Wages", Economic Journal, vol. 49, pp. 150-154.

Thirwall, A.P. (1966) — "Regional Unemployment as a Cyclical Phenomenon", Scottish Journal of Political Economy, vol. 13, pp. 205-219.

Thomas, B. (1934) — "The Movement of Labour into South East England, 1920-1932", Economica, vol. 1, pp. 220-241.

Thomas, B. (1954) — Migration and Economic Growth: a Study of Great Britain and the Atlantic Economy (2nd. edn. 1973). Cambridge: University Press.

Thomas, B. (1972) — Migration and Urban Development, London: Methuen.

Thomas, R.L. and Stoney, P.J.M. (1972) — "Unemployment Dispersion as a Determinant of Wage Inflation in the United Kingdom", in Parkin, M. and Sumner, M.T. (eds.) Incomes Policy and Inflation, Manchester: University Press.

Thomas, T.J. (1975) "Economic History and the Interwar Period: Could Lloyd Goerge have Done it?" (Unpublished).

Thomas, T.J. (1981) "Aggregate Demand in the United Kingdom 1918-45", in Floud, R. and McCloskey, D.N. (eds.) The Economic History of Britain since 1700, vol. 2, Cambridge: University Press.

Tomlinson, J. (1981) Problems of British Economic Policy 1870-1945. London: Methuen.

Tinbergen, J. (1951) Business Cycles in the United Kingdom, 1870-1914, Amsterdam: North Holland.

von Tunzelmann, G.N. (1977) "Britain's New Industries between the Wars; a New 'Development Block'" (Unpublished)

Walters, A.A. (1969) "Money in Boom and Slump", Hobart Papers, No. 44.

Webb, S. and B. (1898) Industrial Democracy, London

Webb, S. and B. (1920) The History of Trade Unionism, 1666-1920, London.

Williamson, J.G. (1980) "Earnings inequality in Nineteenth-Century Britain", Journal of Economic History, vol. 40, pp. 457-475.

Williamson, J.G. (1982) "The Structure of Pay in Britain, 1710-1911" Research in Economic History, vol. 7, pp.1-54.

Wilson, R.A. (1979) "Comparative Forecasting Performance of Disaggregated Employment Models", University of Warwick: Manpower Research Group Discussion Paper, no. 3.

Wood, G.H. (1899) "Some Statistics Relating to Working Class Progress since 1860", Journal of the Royal Statistical Society, vol. 62, pp. 639-666.

Wood, G.H. (1900) "Trade Union Expenditure on Unemployed Benefits since 1860", Journal of the Royal Statistical Society , vol. 63, pp. 81-93.

Wood, G.H. (1909) "Real Wages and the Standard of Comfort since 1850" Journal of the Royal Statistical Society, vol. 72, pp. 91-103.

Wright, J.F. (1981) "Britain's Interwar Experience" in Eltis, W.A. and Sinclair, P.J.N. (eds.) The Money Supply and the Exchange Rate, Oxford: Clarendon Press.

Yeager, L.B. (1966) International Monetary Relations: Theory, History and Policy, London: Harper and Row.