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WORKING TIME IN GREAT BRITAIN
AND AUSTRALIA: AN ECONOMIC ANALYSIS

by

Peter John Dawkins

A Doctoral Thesis

Submitted in partial fulfilment of the requirements
for the award of
Ph.D. of the Loughborough University of Technology
1986

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ACKNOWLEDGEMENTS

The research for this thesis has benefitted greatly from the lively and collaborative research environments in the Department of Economics at Loughborough University and the National Institute of Labour Studies (NILS), Flinders University of South Australia. I am especially indebted to Derek Bosworth who has been of special importance in the development of my research career. Tony Westaway has also been of great assistance during my time at Loughborough University. Professors Dennis Swann and David Llewellyn have provided great encouragement. At NILS, Dick Blandy (Director of NILS and Professor of Economics), has been a constant source of inspiration and advice. All other colleagues at NILS, especially Judy Sloan, Roy Kriegler and Mark Wooden, have also provided a very stimulating environment for my research.

I would also like to acknowledge the help and collaboration of all of the co-authors of my co-authored articles which have been drawn upon in this thesis. They include Derek Bosworth, Tony Westaway, Mark Stevenson, Mark Wooden, Judy Sloan and Cam Rungie. The extent of collaboration with these co-authors is documented in the *statement indicating the authors responsibility for the work submitted*.

I am grateful to the bodies that have provided funding for the research projects upon which the thesis is based. These include the European Foundation for the Improvement of Living and Working Conditions, the Leverhulme Trust, the Equal Opportunities Commission and the Social Science Research Council, in Britain. The Business Council of Australia, the Reserve Bank of Australia and the South Australian Department of Labour have funded the Australian research.

I also acknowledge the assistance provided by research assistants in the various projects that have formed the basis of this thesis. They include John Barrett and Linda Lee at Loughborough and especially Peter Kain and Gavin Poland at

NILS. Garry Goddard, Cathy Hudson, Meredith Baker and Lee Brimble have also provided research assistance at NILS.

I am also grateful to the Institute of Applied Economic and Social Research at the University of Melbourne, for providing the results of simulations on the ORANI model of the Australian economy, reported in Chapter 8. I am especially grateful to Peter Dixon and David Johnson for their help and advice in connection with these simulations. I am grateful to Carter M. and Maddock, R. for allowing me to reproduce two figures from their publications. The same applies to McMahon, P.

My thanks are also due to Angela Fletcher and the secretarial staff of NILS, for the typing of the thesis, and to NILS for funding the typing.

STATEMENT INDICATING THE AUTHOR'S RESPONSIBILITY FOR THE WORK SUBMITTED.

This thesis draws upon the output of various research projects, between 1977 and 1986, for which I have been solely or jointly responsible. These projects have been concerned with various aspects of the economics of working time in Great Britain or Australia. Chapters 1 and 14 have been entirely written specifically for the purposes of this thesis. All other chapters draw upon material which I have previously published in books, journals, research reports and working papers etc. Chapters 2 to 13, therefore, represent edited and usually condensed versions of some of my previous publications, incorporating some new material. Several of these chapters draw from more than one such previous publication. Some of the publications concerned have been co-authored with various other researchers in Great Britain and Australia. Some of them have been my sole responsibility.

The publications include nine journal articles, one article which is currently being considered for publication by a journal, five chapters drawn from three different books, nine chapters drawn from two different research reports and one working paper.

My publications which have been drawn upon are listed below in relation to chapters 2 to 13 of the thesis, to indicate the full extent of co-operative effort. In all cases of co-authorship, each author made, approximately, an equal contribution to the work. This is documented in statements from my co-authors presented to the examiners.

Chapter	Previous publications by the author from which material has been drawn
2	(i) Bosworth, D.L. and Dawkins, P.J. (1981), <u>Work Patterns: An Economic Analysis</u> , Chapters 6 and 7.

- (ii) Bosworth, D.L. and Dawkins, P.J. (1980a), "Shiftworking and Unsocial Hours", Industrial Relations Journal 11 (1), 32-40.
- (iii) Dawkins, P.J. (1985a), "Non-Standard Hours of Work and Penalty Rates in Australia", Journal of Industrial Relations 27(3), 329-349.
- 3 (i) Dawkins, P.J. (1982), "Survey and Case-Study Work in the Chemicals Industry", Chapter 5 in Bosworth D.L. and Dawkins, P.J. (1982a) Optimal Capital Utilisation and Work Patterns in British Manufacturing Industry. Report prepared for the Leverhulme Trust.
- (ii) Dawkins, P.J. (1985b), Penalty Rates and the Organisation of Working Time in Australia (Chapter 14), Research Report to the Business Council of Australia. National Institute of Labour Studies, Flinders University of South Australia.
- 4 (i) Bosworth, D.L. and Dawkins, P.J. (1982b), "Women and Part-time Work," Industrial Relations Journal 13 (3) 32-39.
- 5 (i) Dawkins, P.J. (1985b), "Non-Standard Hours of Work and Penalty Rates in Australia", Journal of Industrial Relations 27 (3) 329-349.
- (ii) Dawkins, P.J. (1985b), Penalty Rates and the Organisation of Working Time in Australia Chapters 10, 11, 12, 13). Research Report to the Business Council of Australia. National Institute of Labour Studies, Flinders University of South Australia.

- (iii) Dawkins, P.J., Rungie, C., and Sloan, J. (1985), "Penalty Rates and Labour Supply: Employee Attitudes to Non-Standard Hours of Work". Mimeo, National Institute of Labour Studies, Flinders University of South Australia. Submitted to the Journal of Industrial Relations and is currently being considered for publication.
- 6 (i) Bosworth, D.L. and Dawkins, P.J. (1980b), "Compensation for Workers' Disutility: Time of Day, Length of Shift and Other Features of Work Patterns", Scottish Journal of Political Economy 27 (1) 80-96.
- 7 (i) Bosworth, D.L. and Dawkins, P.J. (1983), "Optimal Capital Utilisation in British Manufacturing Industry", in Eichorn, W., Henn, R., Neumann, K., and Sheppard, R.W. (eds.), Quantitative Studies in Production and Prices Physica-Verlag, Wurzburg Wien, 73-86.
- (ii) Bosworth, D.L., Dawkins, P.J. and Westaway, A.J. (1981a), "Explaining the Incidence of Shiftworking in Great Britain", Economic Journal 91, 145-157.
- (iii) Bosworth, D.L., Dawkins, P.J. and Westaway, A.J. (1981b), "The Causes of Shiftworking in Great Britain" in Currie, D., Peel, D. and Peters, W. Microeconomic Analysis (proceedings of AUTE Conference 1980).
- 8 (i) Dawkins, P.J. (1985b), Penalty Rates and the Organisation of Working Time in Australia (Chapters 3, 4 and 7) Research Report to the Business Council of Australia, National Institute of Labour Studies, Flinders University of South Australia.

- 9 (i) Dawkins, P.J. and Stevenson, M. (1984),
 "Hours and Earnings in British Manufacturing
 Industry: A Cross-Sectional Analysis",
 Loughborough University Department of
 Economics, Occasional Research Paper No. 75.
- 10 (i) Dawkins, P.J. and Wooden, M.P. (1985),
 "Labour Utilisation and Wage Inflation in
 Australia: An Empirical Examination",
Economic Record 61 (173) 516-521.
- 11 (i) Dawkins, P.J. (1983), "Work-sharing: Panacea
 or Palliative?", Economics 19 (84) 131-146.
- 12 (i) Bosworth, D.L. and Dawkins, P.J. (1981),
Work Patterns: An Economic Analysis,
 (Chapter 15) Gower, Aldershot.
- (ii) Bosworth, D.L. and Dawkins, P.J. (1978)
 "Proposed Changes in the Extent and Nature
 of Shiftworking: some Important Policy
 Issues", Personnel Review 7 (4) 32-36.
- 13 (i) Dawkins, P.J. (1985b), Penalty Rates and the
 Organisation of Working Time in Australia
 Chapter 2 and 8.
- (ii) Dawkins, P.J. (1985c), "Penalty Rates and
 the Review of the Principles", Australian
 Bulletin of Labour 11(3) 178-187.

ABSTRACT

The subject of this thesis is the economics of working time in Great Britain and Australia, with special reference to the length and timing of working hours.

First, the incidence of and trends in work patterns, in Great Britain and Australia, are examined. The incidence of and trends in, normal hours, actual hours, overtime and part-time work in Britain and Australia, show a great deal of similarity. It is more difficult to compare "non-standard working hours" (hours outside of the normal spread of hours, e.g. shiftwork) because of problems with the data. It is clear, however, that non-standard hours of work are important in both countries.

Secondly, using survey and case-study evidence, economic and econometric models, the causes of and influences on work-patterns are analysed. Part-time work, hours worked by full-time employees, shiftwork and other forms of "non-standard" hours are considered. Economic analysis, using a supply and demand framework, is found to provide powerful explanations of patterns of working time. Institutional and social forces, nonetheless, are influential.

Various policy issues are discussed. "Work-sharing", by attempting to reduce normal hours or restrict overtime, is found to be an unlikely remedy for unemployment. Under certain conditions, however, the principle of work-sharing, has some practical potential. Influencing the structure of labour costs, to increase the incentive to employ extra persons rather than extra hours per person, could help. In this respect, shiftwork may have a role.

Various forms of regulation of working hours arrangements are considered and found to be lacking a strong rationale. The case is argued for allowing employers and employees greater flexibility to develop mutually advantageous packages of working time.

PART ONE: INTRODUCTION

CHAPTER 1: INTRODUCTION

Introduction

The subject of this thesis is the economics of working time in Great Britain and Australia. It is particularly concerned with the analysis of the length and timing of working hours. The supply of and demand for labour, operating under various working hours arrangements, are considered, as are various policy issues that are associated with these arrangements. Shiftwork, nightwork, weekend work, overtime, work-sharing, part-time and casual employment are all considered. The analysis is mostly microeconomic, although some macroeconomic issues are included.

In this chapter, the background and policy focus of the research undertaken in Britain and Australia are outlined first. Secondly, the methodology used in the research is discussed. Finally, the structure of the thesis is outlined and its content introduced.

Background and Policy Focus

As noted above, the length and timing of working hours are the central focus of this thesis. While the analysis of the length of working hours has traditionally received a significant amount of attention in the literature, the timing of working hours has received much less attention. The observation that a substantial amount of work takes place outside of "standard working hours", but that such working received so little attention in labour economics, was the initial motivation behind the research. Having embarked upon research into the economics of shiftwork, (a major source of such "non-standard" hours), it soon became clear that there were a number of important policy issues associated with working hours arrangements. It also became clear that a deep understanding of the timing of working hours required an analysis of the inter-relationships between the length and

timing of hours of work. What followed was a programme of research, firstly in Great Britain and later in Australia, concerned with the length and timing of working hours, incorporating a strong interest in their policy implications. Indeed most of the research reported here was carried out as part of a series of projects funded by various bodies with a special interest in policy issues.

The high levels of unemployment experienced in Britain led to questions being asked about whether the organisation of working time could be "better arranged" to secure higher levels of employment. For example, could more shiftworking be a way of providing the complement of capital for extra workers in an economy not investing at a sufficiently rapid rate to accommodate them on normal day work? Indeed Hughes (1977) submitted a plan to the Department of Employment and NEDO embodying this as a policy proposal. Also, could shorter working hours (less overtime and/or shorter normal hours) enable the work to be shared around and more jobs to be created? In conflict with the idea of encouraging shiftwork for employment reasons, was a concern about the effects of shiftwork on health, family and social life. This concern had become most prevalent in continental Europe, but membership of the European Communities was increasingly causing it to become a policy issue in Britain. In France there had been law reform to restrict the growth of shiftworking and the European Commission (1977) formulated proposals for protective legislation to counter the problems associated with shiftworking.

Another policy issue that was topical in Britain at the time of the research on shiftwork reported in this thesis, concerned the protective legislation for women. Under the Factories Act the employment of women on shifts had to receive special authorisation and the employment of women on night shifts had to be authorised by the Secretary of State for Employment. The different treatment of men and women under the law was a matter of concern to the Equal Opportunities Commission which was formulating recommendations to rectify the anomaly. The prohibition of

long hours of work for women covered by the Factories Act was another issue under consideration. The Equal Opportunities Commission put forward its recommendations in 1979.

Furthermore, the Equal Opportunities Commission have taken a general interest in the work patterns of female employees. An issue of special interest for them has been the causes and consequences of part-time work, a form of work dominated by women.

On arrival in Australia, the author again found a high level of interest in the organisation of working time with a strong policy focus. However, while certain analogies could be drawn between the issues at the stake, the dominant policy issue in connection with non-standard hours was of a somewhat different kind. That is because it had arisen out of an ongoing debate about the effects of regulation on labour market flexibility. The Australian labour market is highly regulated with the Australian Conciliation and Arbitration Commission taking on special significance in the setting of wages and employment conditions. In common with developments in Great Britain there was a strong momentum for deregulation taking place in the Australian political economy. The floating of the Australian dollar, deregulation of the financial system and the gradual reduction of protection for Australian industry, were prominent examples of this. In this deregulatory environment there was a growing argument for deregulation of the labour market, for more flexibility to be built into the system, if not for the total dismantling of the arbitration system. A prominent issue in this debate was the regulation of non-standard hours of work with special reference to the "penalty rates" paid for such non-standard hours. Some politicians, commentators and business groups, were calling for more flexibility in the regulation of non-standard hours, including the reduction if not the elimination of penalty rates, especially in some parts of the service sector. Despite the thrust of deregulation in the economy, the incumbent Labour Government was, if anything, strengthening the hold of labour market regulation in the form of the "Prices and Incomes Accord" which formed the basis of the incomes policy which operated through the

arbitration system. Within this Accord with the Australian Council of Trade Unions (ACTU), the unions claimed that there was an implicit understanding that the system of penalty rates would not be changed. Against this, the Confederation of Australian Industry (CAI) argued, in the National Wage Case of April 1985, that the penalty rates component of wages should not be subject to the indexation to the consumer price index, which applied to wages generally. It was against this background that the research on penalty rates and the organisation of working time, reported here, took place. At the same time, incidentally, a Government enquiry (the Hancock Committee of Enquiry) was taking place, into Australian Industrial Relations Law and Systems, which was intensifying the debate about the costs and benefits of deregulation.

The existence of an historically high level of unemployment (though substantially lower than in Great Britain) had led to some interest, in Australia, in the possibility of reduced working time per employee as a way of creating more jobs. The call for such work-sharing was less pronounced than in Britain, but a recent general move towards a 38 hour week in Australia had been argued for by the trade unions, at least in part, on the basis of the possible employment creation. However, in common with Britain, the historically high level of unemployment coexisted with substantial amounts of overtime working, considered by many to be something of a paradox. In a paper about the Australian economy, Gregory and Smith (1983), introduced the link between overtime and *wage inflation* into the debate, suggesting that overtime may be a more sensitive indicator of the heat of the labour market, and that wage inflation could be better explained by overtime hours than by unemployment. This leads to important questions about the apparent divorce between the state of the external labour market as reflected in unemployment rates, and the pressure of demand for labour as reflected by hours of work in firms. This is of obvious importance for governments concerned with reducing unemployment. This inspired the work on "working hours, overtime and wage inflation" reported in this thesis.

Research Methodology

The framework of analysis for the research reported in this thesis is mostly in the neo-classical tradition, which still dominates especially microeconomics. The influence of the institutional environment on economic behaviour, however, is an important theme of the research. The methodology adopted is typical of a great deal of *applied* economic and social research. It is appropriate to mention that the author's view of methodology has been influenced by the writings of McCloskey (1983) and Blandy (1985). These writings accord with the author's previous suspicions, about the methodological underpinnings of economics, based upon his research experience and a limited exposure to the literature on methodology, such as Blaug (1980). McCloskey and Blandy point out that while "positivist falsificationism" is often held to be the only proper scientific methodology of the social sciences, actual practice is now widely agreed to be rhetorical. Blaug deplores this, but McCloskey and Blandy applaud it. Having accepted the rhetorical nature of the social sciences, it is then the task of the researcher to draw upon various sources of ideas, data etc, using inductive and deductive reasoning, referring to the real world in case-study and survey research, using statistical and econometric techniques where appropriate, developing and amending theories, drawing upon guesses, intuition and beliefs, and upon the publications of other respected authors and journals, in such a way as to present a plausible story about the way the world behaves with reference to the issue at stake. Where the data is weak this should not necessarily deflect the researcher's efforts. Make the best of what is available. Search around for the most useful leads. Consistent with this school of thought is the author's enthusiasm for researching topics of interest and policy relevance, in which a small advance in knowledge could be of general concern, rather than pursuing esoteric research of a theoretical or empirical kind because of its theoretical elegance or the sophistication of the econometric analysis.

The Structure and Content of the Thesis

The main body of the thesis is in three parts. Part Two reports the findings of survey and case-study work. Part Three describes various pieces of theoretical and empirical research based upon economic and econometric models of various aspects of the economics of working time. Part Four focuses on a number of policy issues which were mentioned earlier in this introduction. The final part presents some conclusions. Each part of the thesis embodies material related to both Great Britain and Australia. Here the contents of Parts Two, Three and Four are briefly introduced.

Chapter 2 presents useful background data on the incidence of and trends in various working hours arrangements in Great Britain and Australia, with special reference to the length and timing of working hours. Chapter 3 focuses on shiftwork, a major source of non-standard hours of work in Great Britain and Australia, presenting case-study and survey material on the causes of and influences on the nature and extent of shiftwork in Britain and Australia. Chapter 4 presents research arising from the Equal Opportunities Commission's interest in the causes and consequence of part-time work in Great Britain. Chapter 5 focuses on the extent of non-standard hours of work in Australia and the associated penalty rate payments.

Chapter 6 develops a framework of analysis of the premia/penalties paid for working hours due to the length and/or timing of working hours, paying special attention to the argument that these payments represent a compensation for inconvenience to those supplying their labour. This framework is used to evaluate the shift and overtime premia paid in two British collective agreements. Chapter 7 turns to the labour demand side with special reference to the economics of shiftwork in manufacturing industry. A theoretical framework is developed linking the theory of capital utilisation with the choice of work patterns. This theoretical framework is then used for an empirical investigation of shiftwork in Great Britain including the

development and testing of an econometric model. Chapter 8 draws upon the material of the two previous chapters, to consider the economics of non-standard hours in Australia. In addition to shiftwork caused by the incentive to utilise capital intensively, the provision of non-storable products or services outside of normal hours is considered. A simple supply and demand framework is developed to consider the possible effects of penalty rates on Australian labour markets. It is considered that to examine the general equilibrium effects of penalty rates on the Australian economy, incorporating the foregoing theories of non-standard hours, would be of such complexity, that it was, as yet, an impossible task. In the meantime, a first step, in the consideration of the possible order of magnitude of the employment effects of "deregulating" non-standard hours, or reducing penalty rates, could be attempted by examining the influence of wage costs on employment in the various industry groups. This includes a simulation exercise on the Orani general equilibrium model incorporating input-output effects. Chapter 9 turns to the length of working hours estimating a supply and demand model, (using data for Great Britain), based on the previous work of Metcalf Nickell and Richardson (1976) but incorporating new features, including the consideration of the effect of normal hours on total hours, and the presence of shiftworking. Chapter 10 continues to consider the length of working hours, but turns to the macroeconomic issue of their link with wage inflation. This research was first undertaken in Australia as part of an ongoing Australian debate. However it was considered that a similar analysis of British data would be of interest for its own sake, as well as from a comparative point of view. Results using British data, therefore, are also presented.

Chapter 11 examines the case for attempts to "share the work around" by such methods as reducing working hours. Chapter 12 considers the issue of protective legislation in connection with shiftwork and long hours of work. Chapter 13 draws upon the evidence in Chapters 3, 5 and 8, to consider the case for changing the system of penalty rates in Australia.

[Material has been redacted from this thesis for reasons relating to the law of copyright. For more information please contact the author.]

PART FIVE: SUMMARY AND CONCLUSIONS

CHAPTER 14: SUMMARY AND CONCLUSIONS

Introduction

Having examined some survey and case-study evidence, some economic and econometric models, and some policy issues, this chapter presents a brief summary of some of the major findings and draws out some conclusions.

The Length and Timing of Working Hours in Great Britain and Australia - An Overview

Length of Working Period

Evidence going back to the mid-nineteenth century shows that there has been a secular decline in normal (prescribed) weekly hours of work of full-time employees, in both Great Britain and Australia. In the mid-nineteenth century normal hours were about 60 per week. Now, normal hours are about 38 hours per week. These reductions in normal hours have been concentrated into a small number of "waves". In Great Britain there were important reductions in the 1870s; 1919-20; 1946-49; 1960-62; and 1964-66. In Australia there were important reductions in the 1870s; the 1920s; and in 1947-48. In both Britain and Australia there have been further reductions in the early 1980s due to the introduction of the 38 hour week. Comparison of normal hours in the post-war period, shows that Britain and Australia both experienced important reductions in the 1940s but that from 1946 until about 1965, Australia had significantly lower normal hours. Since that time normal weekly hours for the two countries have converged. It should be added that in addition to the secular decline in normal weekly hours, both countries have also experienced a secular increase in annual holiday entitlements, which has reinforced the tendency for "annual normal hours" to decline.

Actual hours have also shown a secular decline but have been substantially higher than normal hours in both countries, due mainly to the overtime working of males. Full-time females (those normally working more than 30 hours in Britain and 35 or more in Australia) tend, on average, to work rather less than normal prescribed hours. Overtime hours are concentrated into a certain proportion of the workforce; about 30 per cent of operatives in manufacturing in Great Britain; about 18 per cent of all employees and 30 per cent of employees in manufacturing, in Australia. The operatives working overtime in Britain, work on average about 8 hours of overtime. In Australia all employees working overtime average about 7 hours of overtime, while those in manufacturing average about 8 hours.

In both countries females dominate part-time employment. Both countries have experienced a substantial growth of part-time employment in the last twenty years, due both to the growth of female employment and the increased incidence of part-time employment amongst females and males. Estimates of the incidence of part-time female employment in Britain, vary, but it would appear that the percentage of females working part-time has grown from about 35 per cent in the late 1960s and early 1970s, to about 40 per cent now. In Australia, the *Labour Force Survey* indicates that part-time employment amongst females grew from about 22 per cent in 1966 to about 37 per cent in 1985. As a proportion of total employment, female part-time employees grew in importance from about 6 per cent in 1966 to about 14 per cent in 1985. The figures, referred to above, imply a very similar trend for Great Britain. We should remember, in qualification, that the definition of part-time work in Britain is narrower, excluding those who normally work 30 to 35 hours per week.

It can be seen that while some differences can be detected, the incidence of and trends in, normal hours, actual hours, overtime and part-time work in Britain and Australia, show a great deal of similarity.

Timing of Working Hours - Shiftwork and other Non-Standard Working Hours

A central focus of this thesis has been the nature, extent, causes and policy implications of "non-standard" hours of work, i.e. hours outside of the normal spread of hours.

Shiftwork, defined as a situation in which one worker replaces another in the same job within a 24 hour period, is an important source of non-standard hours of work. Evidence from surveys in Great Britain in 1954, 1964 and 1978, suggests a secular increase in shiftwork. Shiftworkers as a percentage of all manual workers rose from 12.5 per cent, to 20.0 per cent to 34.5 per cent, causing an increase in the number of shiftwork hours outside of standard hours of work. Changes in the distribution of shift system types, however, caused a reduction in the proportion of shiftwork hours outside of standard hours. This was largely due to the increased importance of "double-day" shifts. Evidence from the *New Earnings Survey*, however, suggests that this long-run increase in shiftworking may have been arrested, perhaps only temporarily, possibly by the depressed state of the British economy, since the late 1970s.

There is much less evidence in Australia about shiftworkers. The main source of evidence comes from a survey in 1981 in which 8.3 per cent of all employees were found to be "rotating shiftworkers", of which about half worked nights. In addition to these, there are those on fixed shifts. We can only speculate about the number of these. It would seem unlikely, however, that this number would be trebled when including those on "fixed shifts", which would be necessary for us to find as much shiftwork as in Britain. In the 1981 survey, there were a similar number of nightworkers found to be working rotating shifts and other nightworkers, each representing about 4 per cent of employees. It is uncertain how many employees work on Australia's equivalent of the double day shift in Britain. One interesting difference, however, emerges. Whereas double day shifts in Britain typically operate from 6 am to 2 pm and 2 pm to 10 pm, in

Australia shift systems are designed around the concept of the standard working day of approximately 8 am to 4 pm. A double shift would result in, approximately, a 4 pm to 12 midnight shift. A three shift system would involve an extra shift from, approximately, 12 midnight to 8 am. This, it seems, is because the concept of standard working hours is ingrained in the Australian award system. Another interesting point is that "twilight shifts" are often found in Great Britain, involving an evening part-time shift usually with all female employees, working from about 6 pm to 10 pm, often without a shift premium. No evidence of such shifts has been found in Australia. This is probably because there is no allowance for such shifts in Australian awards, again reflecting that standard hours are ingrained in the award system and that, if such a shift were initiated, a significant penalty rate would have to be paid.

1981 data on nightworkers in Australia showed that 10.3 per cent of male employees, 5.4 per cent of female employees, and 8.4 per cent of all employees were nightworkers (defined as employed persons who in any one of the four weeks prior to the survey date worked a total of fifteen hours or more between 7 pm and 7 am). Another important form of non-standard hours is weekend work. 1976 data for Australia showed that about one quarter of full-time employees worked at the weekend in their main job, as did about one third of part-time employees.

Explaining the Length and Timing of Working Hours

The long run decline in normal and actual hours of work, of full-time employees, has generally been considered to be the result of increasing real wages leading employees to enjoy their increased living standards partly in increased leisure.

The importance of overtime working has enjoyed various explanations. First there is the incentive to spread the "quasi-fixed costs" of employment. Secondly, there is the adjustment to fluctuations in demand. Another reason is that

of utilising capital equipment more intensively than would be possible with a normal working week. On the other hand, it has been argued that some percentage of overtime is institutionally determined for reasons other than economic efficiency. In so far as this institutional influence, however, is due to trade union and employee pressure for overtime as a means of improving employee compensation, it could be regarded as reflecting supply side forces.

Chapter 9 of this thesis was concerned with estimating a cross-sectional (by industry) model of average working hours of full-time employees which, of course, incorporates normal hours plus overtime. The percentage of employees who were unskilled, the percentage living in conurbations, and the percentage who were shiftworkers were found to have a significantly negative effect, thought to be reflecting supply side factors. Some evidence of a backward bending labour supply curve was also found. The most startling result was the strong highly significant (positive) influence of normal hours of work, suggested by Metcalf *et al.* (1976) to show insufficient variation to lead to any concern about its omission from their model.

Turning to part-time employment, we have noted that its growth has been closely associated with the increased employment of females and the increased incidence of part-time employment amongst males and females. Chapter 4 of this thesis, was concerned with explaining the causes of part-time employment and the causes of the increased or decreased use by firms of part-time work. The analysis was based on a 1979 survey of employers in Great Britain. The most important reason for part-time work was that "jobs do not need full-time cover, not enough work for full-time". The second most important reason was "to cover busy times, peak seasons, and to cover other workers time-off". Problems of recruiting full-time employees and the desire to suit the needs of existing workers and to keep and obtain experienced workers, combined to represent a third major set of explanations. This suggests that while demand side factors may dominate the explanation of part-time work, factors associated with the

preference of many women for part-time employment, also contributed significantly. Where part-time employment had increased in recent times there were a variety of explanations. Again demand and supply side explanations contributed. The three main reasons given, for example, were: "difficult to find full-time workers"; "to suit the needs of a particular department/to suit work load"; and "expansion of department/jobs already employing part-timers". Responses about the reasons for reducing part-time employment showed the tendency to use adjustments in part-time employment as a way of responding to changes in the strength of the demand for labour.

Shiftwork has been an important focus of this thesis. Chapter 3 reported the findings of survey and case-study work examining the reasons for shiftwork. The survey work in the Chemicals industry in Britain suggested that capital savings associated with shiftwork, and the technological necessity of shiftwork were the main reasons for shiftworking. Our two case-studies in the same industry provided further evidence in support of this. There was however, tentative evidence of a cyclical decline in shiftwork between 1979 and 1982. A survey of shiftwork in Australia in 1976, also found capital savings and technological necessity dominating the explanation of shiftwork, although sales demand was another important explanation. Our case-study of a steel-works in New South Wales, found that shiftworking had declined substantially in recent years, especially "seven day" shiftwork. This was because Sunday work was the most expensive and in a period of contraction, it had tended to be eliminated except where it was technologically necessary. The areas where the seven day shiftworking existed were all part of an integrated continuous process operation. In other areas, continuous work was unnecessary but had been used at various times when output demand was high.

The case-studies, in Britain, suggested that there were factors, which would not be incorporated in a straightforward costing of the benefits of shiftwork, which sometimes deter employers from the adoption of shiftwork. These include the

substantial presence of female employees, the control problems associated with the existence of shiftwork, the desire for spare capacity to ensure product security, and even the perhaps rather paternalistic view of an employer that shiftwork is "unsocial".

In Chapter 7, a model was developed linking the theory of capital utilisation with the choice of work patterns, with the aim of explaining the use of shiftwork in manufacturing. In this model the "optimal" work pattern is selected at the point where the marginal capital savings, achieved through more intensive capital utilisation, is equal to the marginal labour cost associated with adopting that pattern. Estimates of labour costs and capital savings, associated with work patterns in British manufacturing industry, tend to support the view that such a model can predict the optimal level of capital utilisation and work pattern.

This theoretical model was further utilised in the development of an econometric model to explain the incidence of shiftwork in Great Britain. The model was based on shiftworking labour supply and demand equations and estimated both as a single equation (reduced-form) model, and as a simultaneous equations model. The results justified the view that the use of shiftwork is strongly founded upon economic grounds, especially the capital savings achieved and in some cases technological necessity. Other important influences were plant size, the percentage of manual employees and of female employees and the age of employees, confirming some other demand side and supply side influences. Wage variables were also significant. The simultaneous equations model was not as successful as had been hoped, especially in connection with the supply equation. One possible problem, with the simultaneous equations model, could be that the shift premium may not operate to equilibriate supply and demand in the way implied by the model. The shift premium may, rather, be an institutional constraint which in turn influences labour demand and supply but does not act as a pricing mechanism to lead to the amount of shiftwork that would result under free market conditions.

In addition to shiftwork, there is a considerable amount of other work during non-standard hours due largely to the timing of the demand for a non-storable product or service. Retailing, hospitality and fast-food are good examples of this. Consideration of this source of non-standard working hours in Chapter 8, suggested that labour demand of this type would depend upon a number of factors including: the level of product demand; the fixity or otherwise of the output - employment relationship; the variability of labour costs over the day or week, i.e. the effect of "penalty rates"; variations in other variable costs over the day or week; the number of hours per person employed; and legal and award constraints. Case-study work, reported in Chapter 5, produced examples of the way in which these variables impinged on various operations in retailing, hospitality and fast-food in Australia. Common practice was found to be the extensive use of casual employees during non-standard hours of work, to deal with peak demands, and to contain labour costs. The use of junior casuals was particularly prevalent in fast-food and retailing during the most "penalty prone" hours. The research in the hospitality sector found some evidence of reduced levels of service and employment because of the presence of penalty rates, especially at the weekend.

Compensation for Non-Standard Hours of Work

This leads us on to the debate about compensation for non-standard hours of work. The economic theory of labour supply can be used to illustrate the need for compensation through penalty rates if the marginal employee associates disutility with non-standard hours. In Chapter 6 a framework was developed to disentangle the "time of day" and "length of shift" compensation embodied in employees wages. This framework was used to analyse two British collective agreements. The time of day wage rhythm that emerged conformed with expectations based on traditional views about "unsocial" hours, with the intriguing quirk of a peak in the early morning as well as at around midnight. Whether the findings are considered to reflect market forces, depends on

the view taken about employee preferences. Our study of employee attitudes to non-standard hours of work, reported in Chapter 5, found widely varying preferences, with some preferring non-standard hours, although this appeared to be less true of shiftwork than other forms of non-standard working hours. Given the heterogeneity of preferences, the appropriate level of compensation can be expected to vary. It could also be expected to change over time. The increased labour force participation of married women and students, for example, has involved a change in attitudes about non-standard working hours. This in turn suggests that a rigid structure of penalty rates across industries and occupations could lead to substantial economic rent being paid to some employees in non-standard hours while many potential suppliers of labour during such times are dissatisfied.

The structure and levels of penalty rates in Australia, which has been a controversial issue, were examined in Chapter 5, and some comparisons made with provisions in various other countries. While there are clear examples of countries where penalty rates are substantially lower, it is difficult to find evidence of countries with penalty rates that are significantly higher. In particular, Australian penalty rates in the hospitality sector are particularly high. In comparison with Britain, this latter finding concerning the hospitality sector, was a prominent contrast.

Work-Sharing

At a time of high unemployment, especially in Britain, the idea that patterns of working time could be re-arranged to share the work around and create more jobs has been the subject of considerable debate. This issue was discussed in Chapter 11. The central focus was the idea, put forward by the TUC, of reducing normal hours which, they had suggested, would have a considerable job creating effect. Placed under close scrutiny this suggestion was found to be very doubtful. Would weekly wage rates fall commensurately? If not, could productivity really be expected to rise significantly? Where

would the necessary capital stock come from for the new employees to work with? Would there not be a tendency for overtime to increase to compensate for the reduced working hours?

With respect to the last question about overtime, the results of the cross-sectional analysis of hours and earnings reported in Chapter 9, would at face value be suggestive of the idea that reductions in normal hours could lead to at least an equivalent reduction in total hours. There was a strongly significantly positive coefficient on normal hours in the explanation of actual hours. It is more likely, however, especially in a cross sectional inter-industry model, that this coefficient reflects the fact that industries in which the suppliers of labour wish to work fewer actual hours, also work fewer normal hours. That is, in the long run, normal hours are not exogeneous in the way implied by our simple model.

Despite the doubt about the efficacy of reduced working hours as a way of work-sharing, especially if the government is prepared to incur some of the cost against which it may be able to offset reductions in unemployment compensation, then work-sharing could have some potential. A reduction of the retirement age of men to 60 could be seen as a possible example of such a policy. It should also be noted, in defence of work-sharing, that there may be a significant proportion of the workforce, who would be prepared to reduce their working hours *with* a commensurate reduction in pay. The ABS survey concerning *Alternative Working Arrangements* (ABS, 1982), for example, found that about 8 per cent of Australian employees were in this category.

A further idea that was discussed in Chapter 11 was that adjustments in the tax-subsidy system associated with employment, to encourage employers to employ more persons rather than more hours per person, could be seen in the same context. Another question, raised earlier, was where would the complement of capital come from, for the new employees to work with? Encouraging shiftwork and other forms of non-

standard hours could be seen as a way of achieving this. We have seen that while there are strong economic reasons for the use of shiftwork, there is some evidence of a reluctance by some employers, to use shiftwork, particularly where female employees are concerned, for partially "non-economic" reasons. In this sense improving the image of shiftworking, by helping to improve shiftworkers quality of work life etc. and involving employees in the determination of their work patterns, could help. Furthermore if it became financially more attractive to employ extra workers rather than more overtime, the model developed in Chapter 7 would predict a significant expansion in the use of shiftwork. Bearing in mind that government interventions have tended to increase the costs of hiring, employing and firing employees, attempts by government to reduce these "quasi-fixed" costs may, rather than have a distorting effect on the labour market, have a beneficial effect.

In Chapter 10, an econometric model of wage inflation in Australia (also tested for Great Britain), was developed and estimated, which suggested that the strength of labour demand may be better reflected by levels of working hours than the level of unemployment. This may also be a reflection of the tendency of firms to adjust their hours worked rather than adjust employment levels and is suggestive of an increasing divorce between the internal and external labour market. Clearly this should be of some concern to governments seeking to reduce unemployment. The whole area, of the relation between work patterns, unemployment and wage inflation, requires further analysis, with a special emphasis on the microeconomic foundations of these macroeconomic problems.

Labour Market Regulation

The regulation of working hours arrangements has arisen as an issue in a number of ways in this thesis. Protective legislation concerning shiftwork and long hours of work in Britain has been one example. The structure of penalty rates

for non-standard hours in Australia, and to a lesser extent constraints imposed on working hours arrangements under the Arbitration System, have been others.

The protective legislation in the Factories Act in Britain concerning the employment of women on shiftwork and long hours, presented the Equal Opportunities Commission with an interesting question. Should such restrictions also be placed on men, or should they be removed from women? One argument, considered in Chapter 12, for imposing restrictions on long hours of work for men, was the possible work sharing/job creating effect. Again, for reasons similar to some discussed in connection with the reduction in normal hours, this was considered to be an unlikely outcome. The case, for restrictions on the length of hours or shiftwork, is presumably based on the idea that the workers themselves do not take into account the adverse effects of these working arrangements, or that there are external diseconomies placed on society which are not taken into account. The lack of hard evidence in support of these contentions suggests that such restrictions are inappropriate. Even if social costs are incurred it is not clear that blanket restrictions on working hours arrangements are the appropriate remedy. The Equal Opportunities Commission's recommendation of the removal of these restrictions was therefore a sensible decision in the circumstances. Concern about the possible adverse effects of patterns of working time on workers and their families and society at large, is best directed towards improving our understanding of the effects of shiftwork and other work patterns, on the health and quality of work life of employees and their families, to help employers and employees to take appropriate actions themselves. Starting and finishing times of shifts, the speed of rotation, the extent of flexible working hours, and the influence of employers over their own arrangements, are all examples of issues that deserve consideration. Developments along these lines, furthermore, could well be expected to improve productivity.

We have seen that, in Australia, working hours arrangements are subject to extensive regulation under the Arbitration

System. A quite rigid structure of penalty rates and working hours arrangements in the face of heterogeneous preferences amongst the labour force concerning working hours, has various detrimental effects. A more flexible approach to the use of non-standard hours of work, and in particular a dilution of the view that penalty rates are a sacred principle, could provide substantial benefits to employers and employees. It might be added, as mentioned in Chapter 13, that the importance of the concept of the standard working week and the system of penalty rates that applies, reflects the dominance of traditional attitudes about the principle breadwinner husband/father, as the dominant form of labour force participation. Another example of this is that part-time employment is not allowed in some awards and, in some others, constraints are imposed on the extent to which it can be used. It is also interesting to note as we did earlier, that the presence of twilight shifts in Britain does not appear to be replicated in Australia.

There is a strong case for some deregulation of working hours arrangements, such that the requirements of employers and employees could be more closely matched. In the *Alternative Working Arrangements Survey* (ABS 1983) it was found that about 28 per cent of employees in Australia wanted to work different numbers of hours (with commensurate changes in pay), with 8 per cent preferring to work less. The same survey found evidence of an excess supply of females wishing to work part-time, of which we saw similar evidence in Britain (Chapter 4). Also, we have seen that preferences about non-standard hours of work vary widely. In the light of these findings, there is a strong case for allowing employers and employees greater flexibility to develop mutually advantageous packages of working time.

REFERENCES

REFERENCES

ABS (Annual), Earnings and Hours of Employees Distribution and Composition, Cat. No. 6306.0.

ABS (Annual), Labour Statistics, Australia, Cat. No. 6101.

ABS (Monthly), The Labour Force, Cat. No. 6203.

ABS (Quarterly), Overtime, Cat. No. 6330.

ABS (1977), Work Patterns of Employees, Cat. No. 6327.0.

ABS (1978), Evening and Nightwork, Cat. No. 6329.0.

ABS (1982), Working Hours Arrangements, Australia, February to May 1981, Cat. No. 6338.0.

ABS (1983), Alternative Working Arrangements, Australia, March to May 1982, Cat. No. 6341.

Allen, R. (1980), The Economic Effects of a Shorter Working Week, H. M. Treasury, June.

Ashworth, J. (1982), "The Supply of Labour", in Creedy, J. and Thomas, B. The Economics of Labour, Butterworths.

Ball, R. and St. Cyr E., (1966), "Short-term Employment Functions in British Manufacturing Industry", Review of Economic Studies 33(95), 179-207.

Barzel, Y. (1973), "The determination of daily hours and wages", Quarterly Journal of Economics, 87 (2), 220-38.

Betancourt, R.R. and Clague C.K. (1981), Capital Utilisation: A Theoretical and Empirical Analysis. Cambridge University Press, Cambridge, 1981.

Bienefeld, M.A. (1972), Working Hours in British Industry: An Economic History, Weidenfeld and Nicholson, London.

Blandy, R. (1985), "Soft Science", Economic Record 61(175), 693-706. Blaug, M. (1980), The Methodology of Economics, Cambridge Surveys of Economics Literature, Cambridge University Press, Cambridge.

Blyton, P. and Hill, S. (1981), "The Economics of Work Sharing", National Westminster Bank Review, November, 37-45.

Bosworth, D.L. (1981), "Specifications of Factor Demand Models and Shiftworking", Scottish Journal of Political Economy 28(3), 256-265.

Bosworth, D.L. and Dawkins, P.J. (1978a), "Proposed Changes in the Nature and Extent of Shiftworking: some Important Policy Issues", Personnel Review 7(4), 32-36.

Bosworth, D.L. and Dawkins, P.J. (1978b), Hours and Patterns of Work: The Impact of Protective Legislation, Report to the Equal Opportunities Commission.

Bosworth, D.L., and Dawkins, P.J. (1979a), Female Patterns of Work and Associated Remuneration, Facilities and Opportunities, Report to the EOC/SSRC Joint Panel, October.

Bosworth, D.L. and Dawkins, P.J. (1979b), "Patterns of Work and Capital Savings: A Model of Capital Utilisation in British Manufacturing Industry" Loughborough University, Department of Economics, Discussion Paper.

Bosworth, D.L. and Dawkins, P.J. (1980a), "Shiftworking and Unsocial Hours", Industrial Relations Journal 11(1), 32-40.

Bosworth, D.L. and Dawkins, P.J. (1980b), "Compensation for Workers' Disutility: Time of Day, Length of Shift and Other Features of Work Patterns", Scottish Journal of Political Economy 27(1), 80-96.

Bosworth, D.L. and Dawkins, P.J. (1980c), "Mechanisation and Automation: Revised Estimates of the Post-War Level and Growth in the Capital Intensity of Production", Loughborough University, Department of Economics, Occasional Research Paper No. 28.

Bosworth, D.L. and Dawkins, P.J. (1981), Work Patterns: An Economic Analysis, Gower, Aldershot.

Bosworth, D.L. and Dawkins, P.J. (1982a), Optimal Capital Utilisation and Work Patterns in British Manufacturing Industry, Report prepared for the Leverhulme Trust.

Bosworth, D.L. and Dawkins, P.J. (1982b), "Women and Part-Time Work", Industrial Relations Journal 13(3), 32-39.

Bosworth, D.L. and Dawkins, P.J. (1983), "Optimal Capital Utilisation in British Manufacturing Industry", in Eichorn, W., Henn, R., Neumann, K. and Sheppard, R.W. (eds.), Quantitative Studies in Production and Prices, Physica-Verlag, Wurzburg Wien, 73-86.

Bosworth, D.L., Dawkins, P.J. and Westaway, A.J. (1981a), "Explaining the Incidence of Shiftworking in Great Britain", Economic Journal 91, 145-157.

Bosworth, D.L., Dawkins, P.J., and Westaway, A.J. (1981b), "The Causes of Shiftworking in Great Britain" in Currie, D., Peel, D. and Peters, W., Microeconomic Analysis (proceedings of A.U.T.E. Conference, 1980).

Bosworth, D.L. and Westaway, A.J. (1983), in Wilson, R. (ed.), Hours of Work, Warwick Research Paper Series, 1983.

Brechling, F. (1965), "The Relationship between Output and Employment in British Manufacturing Industry", Review of Economic Studies 32, 187-216.

Bosworth, D.L. and Dawkins, P.J. (1980c), "Mechanisation and Automation: Revised Estimates of the Post-War Level and Growth in the Capital Intensity of Production", Loughborough University, Department of Economics, Occasional Research Paper No. 28.

Bosworth, D.L. and Dawkins, P.J. (1981), Work Patterns: An Economic Analysis, Gower, Aldershot.

Bosworth, D.L. and Dawkins, P.J. (1982a), Optimal Capital Utilisation and Work Patterns in British Manufacturing Industry, Report prepared for the Leverhulme Trust.

Bosworth, D.L. and Dawkins, P.J. (1982b), "Women and Part-Time Work", Industrial Relations Journal 13(3), 32-39.

Bosworth, D.L. and Dawkins, P.J. (1983), "Optimal Capital Utilisation in British Manufacturing Industry", in Eichorn, W., Henn, R., Neumann, K. and Sheppard, R.W. (eds.), Quantitative Studies in Production and Prices, Physica-Verlag, Wurzburg Wien, 73-86.

Bosworth, D.L., Dawkins, P.J. and Westaway, A.J. (1981a), "Explaining the Incidence of Shiftworking in Great Britain", Economic Journal 91, 145-157.

Bosworth, D.L., Dawkins, P.J., and Westaway, A.J. (1981b), "The Causes of Shiftworking in Great Britain" in Currie, D., Peel, D. and Peters, W., Microeconomic Analysis (proceedings of A.U.T.E. Conference, 1980).

Bosworth, D.L. and Westaway, A.J. (1983), in Wilson, R. (ed.), Hours of Work, Warwick Research Paper Series, 1983.

Brechling, F. (1965), "The Relationship between Output and Employment in British Manufacturing Industry", Review of Economic Studies 32, 187-216.

Butlin, M.W. (1977), "A Preliminary Annual Database 1900/01 to 1973/74", Reserve Bank of Australia, Research Discussion Paper 7701.

Carmichael, J. (1974), "Modelling Inflation in Australia" paper presented to the Fourth Conference of Economists, Canberra.

Carter, M. and Maddock, R. (1983), "Working Hours in Australia: Some Issues" in Blandy, R. and Covick, O. eds. (1983), Understanding Labour Markets in Australia, George Allen and Unwin, Sydney.

Carter, M. and Maddock, R. (1984), Working Hours in Australia, Committee for Economic Development of Australia, Information Paper No. 1P, 16.

Central Statistical Office (CSO) Great Britain, (Annual) National Income and Expenditure HMSO, London.

Central Statistical Office (CSO), Great Britain, (Annual), Annual Abstract of Financial Statistics, HMSO, London.

Central Statistical Office (CSO), Great Britain, (Annual), Economic Trends, HMSO, HMSO, London.

Centre of Policy Studies (1983), The Effect of Penalty Rates on the Victorian Hospitality Sector, September.

Challen, D. (1984), "The Wages-Employment Relationship in Australian Macroeconomic Models", Bureau of Labour Market Research, Monograph Series, No. 2.

Chamber of Commerce and Industry, SA Incorporated, (1983), Schedule of Penalty Rates applying to Work Performed in Overtime and Shiftwork and Meal Allowance, mimeo, December.

Clegg, H. (1970), The System of Industrial Relations in Britain, Basil Blackwell, Oxford.

Cook, F.P. (1972), Shiftwork, Institute of Personnel Management, London.

Craine, R. (1973), "On the Service Flow from Labour", Review of Economic Studies, 40, 39-46.

Dawkins, P.J. (1982), "Survey and Case-Study Work in the Chemicals Industry", Chapter 5 in Bosworth, D.L. and Dawkins, P.J. Optimal Capital Utilisation in British Manufacturing Industry, Report prepared for the Leverhulme Trust.

Dawkins, P.J. (1983), "Work-Sharing: Panacea or Palliative?", Economics 19(84), 131-146.

Dawkins, P.J. (1985a), "Non-Standard Hours of Work and Penalty Rates in Australia", Journal of Industrial Relations 27(3), 329-349.

Dawkins, P.J. (1985b), Penalty Rates and the Organisation of Working Time in Australia. Report to the Business Council of Australia, National Institute of Labour Studies, Flinders University of South Australia.

Dawkins, P.J. (1985c), "Penalty Rates and the Review of the Principles", Australian Bulletin of Labour 11(3), 178-187.

Dawkins, P.J., Rungie, C. and Sloan, J. (1985), "Penalty Rates and Labour Supply: Employee Attitudes to Non-Standard Hours of Work", mimeo, National Institute of Labour Studies, Flinders University of South Australia.

Dawkins, P.J. and Stevenson, M. (1984), "Hours and Earnings in British Manufacturing Industry: A Cross-Sectional Analysis", Loughborough University, Department of Economics, Occasional Research Paper No. 75.

Dawkins, P.J. and Wooden, M.P. (1985), "Labour Utilisation and Wage Inflation in Australia: An Empirical Examination", Economic Record 61(173), 516-521.

Department of Educational Research, University of Lancaster (1973), Return to Teaching, University of Lancaster.

Department of Employment (DE), G.B. (1971), British Labour Statistics: Historical Abstract 1886-1968, HMSO, London.

Department of Employment (DE), G.B. (Annually), British Labour Statistics Yearbook, HMSO, London.

Department of Employment, (DE), G.B. (1965), "Shiftworking" in Department of Employment Gazette, H.M.S.O. London, pp. 148-155.

Department of Employment, (DE), G.B. (1975), Women and Work: A Review, D E Manpower Paper No. 11, H.M.S.O. London.

Department of Employment, (DE), G.B. (Monthly), Department of Employment Gazette, HMSO, London.

Department of Employment (DE), G.B. (Annual), New Earnings Survey.

Department of Employment, (DE), G.B. (Annual), Time Rates of Wages and Hours of Work, London, H.M.S.O.

Department of Employment, (DE), G.B. (Annual), Family Expenditure Survey, HMSO, London.

Department of Industrial Relations, Australia, (1981), Background Paper on Penalty Rates, mimeo, February. Presented to the National Labour Consultative Council.

Department of Science and Technology, Australia (1980), Shiftwork in Australia: a study of its effects, AGPS, Canberra.

Dixon, P.B., Parmenter, B.R., Sutton, J. and Vincent, D.P. (1982), ORANI: A Multisectoral Model of the Australian Economy, North Holland, Amsterdam.

Equal Opportunities Commission (1977), Protective Legislation: Who Benefits - Men or Women?, HMSO, London, 1977.

Equal Opportunities Commission (1979), Health and Safety, Legislation: Should We Distinguish Between Men and Women? EOC.

European Commission (1977), "Memorandum on Shiftwork", EC Discussion Paper, V/1135/177 EN.

European Commission (1982), Memorandum on the Reduction and Reorganisation of Working Time, Brussels, December.

Feldstein, M.S. (1967), "Specifications of the labour input in the aggregate production function", Review of Economic Studies, 34, 375-86.

Financial Times (1978), "Tachograph Hearing Next Month", Financial Times, London, 10th November.

Fishwick, F. and Harling, G. (1974), Shiftwork in the Motor Industry, NEDO, London.

Flemming, J.S. (1975), "Wage rigidity and employment adjustment" in J.M. Parkin and A.L. Nobay (eds.) Contemporary Issues in Economics, Manchester.

France, R.R. (1962), "Wages, Unemployment and Prices in the United States, 1890-1932, 1947-1957", Industrial and Labour Relations Review 15(2), 171-190

Freebairn, J. (1977), "Do Wages Matter?", Australian Economic Review, 3rd Quarter, 25-35.

- Friedman, M. (1968), "The Role of Monetary Policy", American Economic Review 58, 1-18.
- Gallup (1978), Women and Mothers Study, Prepared for Womens Own, Gallup, London, 1978.
- Gregory, R.G. and Duncan, R.C. (1979), "Wages, Technology and Jobs", Australian Economic Review, 1st Quarter, 22-32.
- Gregory, R.G. and Smith, R.E. (1983), "Unemployment, Inflation and Job Creation Policies in Australia" paper presented to the Conference on Government Policies toward Inflation and Unemployment in Developed Economies, Macquarie University.
- Hagger, A.H. (1978), "Inflation", chapter 3 in Gruen, F.H. (ed.), Surveys of Australian Economics, George Allen and Unwin, Sydney.
- Harkness, R. and Krupinski, B. (1977), "Two Surveys - Working Hours Arrangements and Shiftwork", Work and People 3, Winter, 27-34.
- Hart, R.A. (1983), "The Phillips Curve and Cyclical Manhour Variation". Oxford Economic Papers, 35(2), 186-201.
- Hart, R.A. and Sharot, T. (1978), "The Short-Run Demand for Workers and Hours: A Recursive Model", Review of Economic Studies 45, 299-309.
- Health and Safety Executive (1973), Hours of Employment of Women and Young Persons, Health and Safety Booklet No. 23, Department of Employment, HMSO London.
- Hughes, B. and Leslie, D. (1975), "Hours of Work in British Manufacturing Industries", Scottish Journal of Political Economy XXII(3), 293-304.
- Hughes, H., Bannister, R., Lion, D., Morawetz, D. and Thoumi, F. (1976), "Capital Utilisation in Manufacturing in Developing Countries", World Bank Staff Working Paper, no. 242.

Hughes, J. (1977), "Shiftwork and the Shorter Working Week", Personnel Management 9, 5, 18-20.

Hughes, J.J. (1980), "The Reduction of the Working Week: A Critical look at Target 35", British Journal of Industrial Relations, 18(3), 287-296.

IFF (1978), Shiftwork in Manufacturing Industry, Research Report to the European Foundation for the Improvement of Living and Working Conditions, by IFF Research Ltd.

IFF (1979), Women and Work, Report to the EOC/SSRC Joint Panel by IFF Research Ltd.

IFF (1980a), Survey of Shiftwork in the Chemicals Industry, Report to the European Foundation for the Improvement of Living and Working Conditions.

IFF (1980b), Survey of Shiftwork in the Chemical Industry, Technical Appendix, Report to the European Foundation for the Improvement of Living and Working Conditions.

Industrial Society (1975), Survey of Shiftworking Practices, The Industrial Society Survey, No. 194, London.

Ingram, A.H., and Sloane, P.J. (1985), "Shiftwork and Socio-Economic Policy", International Journal of Manpower, 6 (5), 3-15.

International Labour Office (1984), "Bulletin of Labour Statistics", Geneva, Annual.

International Labour Organisation (1978), "Working Paper on Night Work", Tripartite Advisory Meeting on Night Work, ILO, Geneva, Switzerland.

Johansen, L. (1960), A Multi-Sectoral Study of Economic Growth, North Holland, Amsterdam (2nd edition 1974).

Johnston, H.N., Campbell, R.B. and Simes, R.M. (1978), "The Impact of Wages and Prices on Unemployment", Economic Papers No. 60, December, 504-07.

Jones, J. (1976), Target 35: The Case for the 35 Hour Week, TGWU, Pamphlet, April 1976.

Jonson, P.D., Battelino, R. and Campbell, F. (1978), "Unemployment: an Econometric Dissection", Research Discussion Paper 780, Reserve Bank of Australia, December.

Jonson, P.D., Mahar, K.L. and Thompson, C.J. (1974), "Earnings and Award Wages in Australia", Australian Economic Papers 13, 80-98.

Kirby, M.G. (1981), "An Investigation of the Specification and Stability of the Australian Aggregate Wage Equation", Economic Record 57, 35-40.

Kuh, E. (1967) "A Productivity Theory of Wage Levels - An Alternative to the Phillips Curve", Review of Economic Studies 34, 333-360.

Leslie, D.G. and Laing, C. (1978), "The Theory and Measurement of Labour Hoarding". Scottish Journal of Political Economy, 25 (1), 41-56.

Leslie, D. and Wise, J. (1980), "The Productivity of Hours in U.K. Manufacturing and Production Industries", Economic Journal, 90, 74-84.

Levinson, H. (1967), "Unionism, Concentration and Wage Changes: Towards a Unified Theory", Industrial Relations Review, 20.

Lewis, H.G. (1957), "Hours of Work and Hours of Leisure" in L.R. Tripp (ed.), Proceedings of the Nineth Annual Meeting of the Industrial Relations Association.

MacDonald, J. (1975), "Wages and Prices in Australia: on

the Short and Long-run Trade-offs Between Inflation and Unemployment", Australian Economic Papers, 28, 121-9.

McCloskey, D.N. (1983), "The Rhetoric of Economics", Journal of Economic Literature,XXI(2), 481-517.

Mackay, D.I. and Hart, R.A. (1974), "Wage Inflation and the Phillips Relationship", Manchester School, 42 (2), 136-161.

McMahon, P.J. (1983), "Australian Working Time Adjustments and Part-time Work", Bureau of Labour Market Research Conference Paper No. 33.

Macken, The Hon. Justice J.J. (1983), Report to the Minister for Industrial Relations on the Opening and Closing Hours of Shops, Industrial Commission of New South Wales, October.

Marris, R. (1964), The Economics of Capital Utilisation, Cambridge University Press, Cambridge.

Marris, R.L. (1970), Multiple Shiftwork, NEDO, HMSO, London.

Maurice, M. (1975), Shiftwork: Economic Advantages and Social Costs, ILO, Geneva.

Metcalf, D., Nickell, S. and Richardson, R. (1976), "The Structure of Hours and Earnings in British Manufacturing Industry", Oxford Economic Papers 28(2), 284-303.

Mincer, J. (1966), "Labour Force Participation and Unemployment", in R.A. and M. Gordon (eds.), Prosperity and Unemployment.

Ministry of Labour, G.B. (1954), "Shiftworking" in Ministry of Labour Gazette, HMSO, London, pp. 337-342.

Ministry of Labour, G.B. (1965), "Shiftworking" in Ministry of Labour Gazette, HMSO, London, April.

Mott, P.E. et al., (1965), Shiftwork: The Social Psychological and Physical Consequences: Ann Arbor:

University of Michigan Press.

Nadiri, N.J. and Rosen, S. (1969), "Inter-Related Factor Demand Functions", American Economic Review 59, 451-471.

National Board for Prices and Incomes (NBPI)(1970), Hours of Work, Overtime and Shiftworking, Report No. 161, Cmnd 4554, HMSO, London.

National Economic Development Office (1970), Multiple Shiftwork, HMSO, London, 1970.

Nevile, J.W. (1977), "Domestic and Overseas Influence on Inflation in Australia", Australian Economic Papers 28, 121-9.

Newton, K. and Kalisch, D.W. (1983), "The Australian Phillips Curve: Empirical Evidence and Policy Implications, from a Canadian Perspective", Bureau of Labour Market Research Conference, Paper No. 32.

OECD (1966), Wages and Labour Mobility, Paris.

OECD (1978), Australia: Economic Surveys, OECD, Paris, April.

Office of Population Censuses and Surveys (OPCS) G.B. (quinquennially), Census of Population, HMSO, London.

Office of Population Censuses and Surveys (OPCS) G.B. (Annual), General Household Survey, HMSO, London.

Parkin, J. (1973), "The Short-Run and Long-Run Trade-Offs between Inflation and Unemployment in Australia", Australian Economic Papers 12, 127-44.

Paterson, P.R., and Mackay, K.R. (1982), "Changes in the Youth Labour Market: 1971 to 1981", Bureau of Labour Market Research, Working Paper No. 11.

Peat, Marwick, Mitchell and Co. (1975), The Impact of Penalty Wage Rates in the Australian Hospitality Industry.

Phelps, E.S. (1967), "Phillips Curves, Expectations of Inflation and Optimal Unemployment over Time", Economica 34, 254-81.

Phelps, E.S. (1968), "Money Wage Dynamics and Labour Market Equilibrium", Journal of Political Economy 76, 678-711.

Phipps, A.J. (1982), "Australian Unemployment: Some Evidence from Industry Labour Demand Functions", Australian Economic Papers, December, 333-344.

Rao, B.B. (1977), "An Analysis of the Short and Long-Run Trade-Offs between Unemployment and Inflation and Estimates of the Steady State Unemployment Rate in Australia", Australian Economics Papers, 16, 273-84.

Rosen, S. (1968), "Short-term employment variation in Class 1 railroads in the US 1947-63", Econometrica 36 (3-4), 511-529.

Rungie, C. (1984), "The Organisation of Working Time; Verbatim Transcripts for a Study of Attitudes in Australia", mimeo, National Institute of Labour Studies.

Reserve Bank of Australia (1977), Annual Report 1977, Reserve Bank of Australia, Sydney.

Santomero, M.S. and Seater, J.S. (1978), "The Inflation-Unemployment Trade off: A Critique of the Literature", Journal of Economic Literature 16, 499-544.

Seear Baroness, N. (1971), Re-entry of Women to the Labour Market after an Interruption in the Civil Service, HMSO, London.

Sergean, R., Howell, D., Taylor, P.J. and Pocock, S.J.

(1969), "Compensation for Inconvenience: An Analysis of Shift Payments in Collective Agreements in the UK", Occupational Psychology, 43, 183-192.

Sloan, J. and Wooden, M. (1984), "Part-Time Work, School Retention and Unionisation: Aspects of the Youth Labour Market", National Institute of Labour Studies, Working Paper, No. 72.

Sloane, P. (1978), Economic Aspects of Shift and Night work in Industrialised Market Economies, International Labour Review, 117(2), 129-142, ILO, Geneva.

Stewart, M.B. and Wallis, K.F. (1981), Introductory Econometrics 2nd Edition, John Wiley and Sons, New York.

TUC (1978), Economic Review.

TUC (1982), Programme for Recovery.

Tyler, C. (1978), "Unions Crusade for the Shorter Working Week", Financial Times, 2nd June.

Vanderkamp (1972), "The Phillips Relation: A Theoretical Explanation - A Comment", Economica 35, 179-83.

Walker, J. (1978), Human Aspects of Shiftwork, Institute of Personnel Management, London.

Wallace, M. ed., (1985), Shiftwork and Health, Brain-Behaviour Research Institute, Department of Psychology, La Trobe University, Bundoora, Australia, 3083.

Wallis, K.F. (1972), "Testing for Fourth Order Autocorrelation in Quarterly Regression Equations", Econometrica, 40, 617-36.

Winston, G.C. and McCoy, T.O. (1974), "Investment and the Optimal Idleness of Capital", Review of Economic Studies, 41, 419-28.

