Exit and Voice in British Workplaces 1979-2000: an Analysis Using Case Studies and Statistical Material

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Abstract

The exit-voice model of the labour market hypothesises that employees who experience a deterioration in working conditions will face a choice between exit or voice. This thesis uses case study and statistical material to analyse recourse to exit and to voice in the UK over the period 1979-2000. A major contribution of the thesis comes in its use of unique data for both statistical and case study analysis. The introductory chapter lays out the data sets which are employed and discusses their uniqueness.

Chapter 2 illustrates how voice channels have changed over time, before looking at correlations between collective and individual voice channels and, respectively, satisfaction with work and labour turnover. The next chapter uses a case study of a food manufacturer with particularly high absenteeism to test the stylised facts of absence and to investigate whether absence is a form of voice, indicating unhappiness with conditions of work, or a form of exit. The fourth chapter examines the strength of voice over time, as illustrated by trade unions' and unrepresented employees' ability to influence workplace change. We hypothesise that change implies greater employee effort, which should therefore be accompanied by enhanced remuneration. The link between trade union recognition and the linking of change and rewards is pursued.

As we discuss in the conclusion, representation in the UK has changed profoundly over the last twenty five years. Our data confirms the continuation of union influence where they retain recognition rights, but that this is less common. However, our analysis of new direct forms of voice shows that they can have positive outcomes for employees and firms. The thesis makes another contribution in challenging the stylised facts of the phenomena of job satisfaction, quits and absence, emphasising the need to explore new sources of data.

Acknowledgements

This is for Edith and Jimmy

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Chapter 1. Introduction and Summary

Introduction

The exit-voice model of deteriorating relationships argues that consumers or members of an institution have two options when faced with a decline: they can use voice to restore the quality of the product or the position of the organisation; or they can choose to exit the relationship (Hirschman: 1970). This model has an obvious application to the labour market, suggesting that employees who experience a deterioration in working conditions face a choice between exit or voice (Freeman: 1976, 1978, 1980). Whilst Hirschman (1970) originally argued that the choice would reflect the individual's loyalty, in the case of an employee the decision will reflect the availability and costs of using voice, and the availability of alternative work. This thesis uses case study and statistical material to analyse employees' recourse to exit and/or voice in the UK over the period 1979-2000. This period saw a reduction in trade union recognition and membership, and the development of human resource management emphasising direct communication between employees and managers and direct involvement schemes designed to capture employees' tacit knowledge. These changes may have transformed the range of voice options and affected the cost of choosing to exercise voice. The period also saw two periods of high (double digit) unemployment and an increase in female labour market participation (Nolan and Walsh: 1995). These changes may have altered both access to and the cost of exit.

We examine the changing patterns of UK voice mechanisms and the scope of employee voice using large nationally representative data sets. The pattern of voice across five national companies is reported, and then data from the same companies is used to explore the relationship between access to different voice mechanisms and both job satisfaction and quits. A particularly rich case study explores the issue of absenteeism at a medium sized food manufacturer in North West London and investigates whether absence can be construed as a form of exit or a form of voice.

In the tradition of industrial relations, literature from a wide range of disciplines is used to explore the themes of exit and voice and the associated phenomena of job satisfaction, absence and quitting. The discussion blends arguments from psychology,

sociology, economics, political economy and business history, whilst the techniques are largely those of a labour economist. A range of data sources are exploited to draw a rich picture of exit and voice in the UK over the last twenty five years. All chapters rely on the Workplace Industrial Relations Surveys (WIRS) to provide a sense of context. Drawing on personnel managers', financial managers', trade union representatives' and, since 1998, employees' experiences, the WIRS offer a widely used, rich bank of information. These surveys represent a collaborative attempt to provide a snapshot of the state of employment relations at the time of each survey, but also use panel elements to chart changes in organisational practices. The CBI settlement databank is used to explore the pattern of workplace change and associated remuneration. Whilst this focuses purely on the private sector, it offers detailed information on between 950 and 1750 settlement groups for each year. The survey records changes to working practices, the annual pay settlement and associated pressures, and organisational characteristics. The sample was based originally upon the 1978 Census of Production and hence is much broader than members of the CBI organisation, and has a strong panel element. The surveyors strive to replace organisations that leave with ones of the same industry and region, to retain the representative nature of the source.

Another data set is used to explore the pattern of voice mechanisms and their relationship with job satisfaction and quitting: a five company sample of firms who were clustered in the bottom quarter of the earnings distribution at the time of data collection, 1996. This sample is interesting not merely for covering workers on relatively low wages, an area not commonly researched; four of the five also represent the service sector, which also tends to be neglected. The companies are in the fast food restaurant, leisure, hotel, retail and food manufacturing industries, and details were provided for plants in six regional clusters: the South West, North West, West Midlands, the Wales border, North West London and West Yorkshire. Payroll and personnel information was supplemented with staff questionnaires recording educational, household composition information and aspects of job satisfaction. Three firms provided time series information, the retail and hotel chains and the food manufacturer, which enabled us to pursue issues in greater depth. The food manufacturer in particular disclosed information on a range of issues leading to the

development of a case study of their problems with absenteeism. Each chapter discusses at length the data used for analysis.

Summary

The first substantive chapter illustrates how voice channels have changed over time, before looking at correlations between collective and individual voice channels and, respectively, satisfaction with work and labour turnover. The exit-voice model of the labour market suggests that providing workers with a channel for grievances and demands may reduce their propensity to exit. Voice mechanisms also provide workers with opportunities to offer comments on the work environment and labour process, and may lead them to offer productivity enhancing suggestions. Such outcomes offer benefits to employers and their workers. However, unions have been in decline in the UK for more than 20 years, whilst new individually-oriented voice mechanisms, such as newsletters, quality circles, appraisals, and team briefings, are increasingly visible. This paper examines the changing pattern of voice mechanisms in the UK using Workplace Industrial Relations Surveys (WIRS) for 1980, 1990 and 1998, and in particular looks for evidence that these individual mechanisms are replacing collective ones. Whilst individual or direct forms of voice have multiplied, collective forms remain accessible to more than 50 per cent of the surveyed employees. This chapter then takes a data set of five national UK companies, employing predominantly female workers in low paid jobs. The picture of voice in this primary data set is contrasted with that of WIRS. Next, the relationship between different institutional fora for expressing voice and worker satisfaction is analysed. Job satisfaction is positively related with the use of direct communication mechanisms, but in contrast to previous work, there is no evidence of a negative relationship between collective voice and job satisfaction. Finally, the chapter reinvestigates the relationship between exit and voice using a range of communication mechanisms as independent variables. Again in contrast to previous work, union recognition is strongly, positively related to labour turnover, whilst direct financial involvement is negatively related to quits.

The next chapter uses a case study of a food manufacturer, Bun Factory, with particularly high absenteeism to investigate whether absence is a form of voice, indicating unhappiness with conditions of work, or a form of exit. The relationship between

demographic and workgroup characteristics is explored, with many relationships running counter to the stylised facts of absenteeism. Longitudinal analysis, covering a series of improvements to working conditions, finds no evidence that absence is used to express voice. However, whilst the discrete improvements have little differential impact across the skill groups, a decline in absence is exhibited as the changes are rolled in, suggesting that the outcome was an improved industrial relations climate. The final aim of this chapter is to identify whether absenteeism is used as a form of exit. A range of "withdrawal" models are examined, which posit that absenteeism behaviour spills over in to quitting, or that those who are absent progress to quitting or that absence and exit are alternative forms of behaviour. Our data suggest that absence *may* be a form of exit, with employees progressing from absenteeism to quitting.

The final substantive chapter examines the strength of voice over time, as illustrated by both trade unions' and unrepresented employees' ability to influence workplace issues. Data from the Workplace Industrial Relations Surveys are used to chart how trade union negotiation over a range of workplace issues has become less common over time. In the CBI data set, evidence of the introduction of workplace change, as part of the annual pay deal, falls over time. This may indicate that managers have been able to shift the frontier of control in their favour and are able to introduce change without negotiation or alternatively, that there is little room for further productivity enhancing measures. Given evidence from other sources, the latter explanation is unlikely. Focusing on negotiations over the rewards associated with workplace change, the paper hypothesises that change implies greater employee effort. Therefore it should be accompanied by enhanced remuneration. Employees' ability to extract wage compensation for changes has fallen only a little over the sample period, though recently employees are more likely to be "rewarded" with improved holidays or working hours arrangements than with enhanced pay rises. Trade union recognition is positively associated with a greater probability of obtaining compensatory remuneration at the time of workplace change.

Chapter 2. An Examination Of Voice Institutions Over Time; With An Analysis Of The Impact Of Different Voice Institutions On Workers' Satisfaction And Quit Rates

1. Introduction

The exit-voice dichotomy was first discussed by Hirschman in the context of the declining performance of organisations in 1970. Although the theory was originally conceived of to explain changes in consumer-buyer relations, this theory lends itself well to analysis of the labour market. Freeman (1976, 1978, 1980) pioneered the application of exit-voice theory to the employment relationship, and it has subsequently been used by a number of academics to illuminate the decision of workers to terminate their employment. The existence of voice may be of benefit to employees if they feel able to raise grievances and issues which trouble them. This may feed through to a beneficial effect on morale, their utility or satisfaction, their productivity and of course the probability of exit. The employer may benefit if the outcome of voice results in something tangible such as lower labour turnover, and if the costs of rehiring and training are non-negligible (Mowday et al: 1982). In the firms examined later in this chapter, employers claim to spend between £200 and £700 on hiring and training each new recruit. Therefore, voice may offer real benefits in terms of reducing turnover. Different voice channels may also benefit the employer if they encourage workers to share their tacit knowledge about the production or service provision process.

Most existing work focuses on the trade union as the mouthpiece for voice, and analyses the success of the union as this mouthpiece using nationally representative data sets. Most of these studies use American data (Freeman: 1976, 1978, 1980; Borjas: 1979): few have been conducted on the impact of voice mechanisms in the UK. However, it has been well documented that trade union recognition and membership in most developed nations has fallen over the last twenty years or so, so relying on trade unions to exercise voice may no longer be the only option. In the UK, the focus of this study, membership and recognition have declined substantially from 1980 until very recently. Over the same period

there has been a shift from a pluralistic view of industrial relations to a more unitarist approach, most notably on the part of employers Poole and Mansfield (1993). So whilst during the 1970s voice mechanisms tended to be formal participatory structures, relying on representatives, such as shop stewards, worker directors and members of consultative committees (Marchington et al: 1992a), there has been a substantial growth in interest in new forms of communication between employers and their staff over the 1980s and 1990s (Tillsley: 1994). These mechanisms are often more direct, choosing to bypass the use of labour representatives, and there is a much greater support for schemes to increase the complexity of the financial relationship between employer and worker.

We are interested in the current pattern of voice and the effects associated with direct communication channels, as compared to indirect forms of voice. This chapter will examine the changing incidence of collective and individualistic voice mechanisms in the UK over the last twenty years using the Workplace Industrial Relations Surveys (WIRS) series. A five-company data set, comprising regional clusters of sites of nationally established companies, will be examined for a cross sectional picture of voice mechanisms. This primary data set has two major strengths. It provides information on sizeable groupings of employees within identifiable workplaces, so we can choose between controlling for firm or site specific factors. Additionally, this data can further add to our knowledge of voice in the UK, as it focuses on service sector workplaces, employing mainly women and relatively low paid labour. Having offered a picture of the incidence of different voice mechanisms in branches of these five companies, cross sectional analysis will be employed to examine the relationship between voice and worker utility or satisfaction. It may be that satisfaction is a possible stepping stone between voice and exit. This chapter also uses time series data to re-examine the relationship between voice and exit in two of the service sector companies.

There are three hypotheses underpinning this research. The first hypothesis is that voice mechanisms have shifted over time from being collective, representative fora to more individualistic communication methods. Next we predict that worker utility or satisfaction is likely to be higher under more direct, company controlled communication mechanisms, not least because the employer is better able to ensure that the right message is passed on or

down to workers with this type of mechanisms than through trade union representatives. These might also satisfy the demand of increasingly better educated workers for both greater information and more immediate disclosure. Finally, collective procedures give greater protection to workers, and union recognition often indicates a degree of real power-sharing. Therefore we hypothesise that employees will be less likely to separate from a given job if they enjoy some form of collective voice. The structure of the chapter is as follows: the next section outlines the theoretical work of Hirschman and the application of his model to the labour market by Freeman. Section 3 discusses literature on employee voice, and its links with both satisfaction and separations, and generates some testable hypotheses. The data section introduces both the Workplace Industrial Relations Surveys and the primary data set and considers methodological issues arising from the choice of data and techniques, section 4. Section 5 outlines both a longitudinal and cross sectional pattern of voice mechanisms, before exploring the relationships between voice and satisfaction and voice and separation. Conclusions are offered in Section 6.

2. Exit-Voice in the Labour Market

Hirschman's (1970) thesis first presented the dichotomy between exit and voice. He was concerned primarily with developing a model which could predict behaviour when the quality of a product one consumed deteriorated. Whilst he did not touch upon analysis of labour market relationships, he did suggest that the model could be applied to the behaviour of members of an organisation, such as a trade union, which was in the midst of a period of decline. Existing competitive theory did not touch upon the behaviour within a firm, and predicted that an organisation in decline would lose customers, almost immediately go out of business and be replaced by a more successful operator. This would restore the competitive nature of the industry, and the speed of adjustment would ensure that there was little loss in utility to consumers. Hirschman sought to bring a little realism to economic models and argued that consumers need not exit from their relationship with a supplier. Instead they could choose to exercise voice in order to encourage an improvement in the firm's performance, and presumably the quality of the good. Similarly members of an institution could chose to remain so and fight for a restoration of previous performance from within. At this time voice was a phenomenon associated with political science rather

than economics, and the exercise of voice did not appear a particularly rational economic activity.

Hirschman believed that the deciding factor when faced with the choice between voice and exit was loyalty. Whilst loyalty to a product might seem a little unlikely unless an alternative was rare, this concept makes more sense when considering membership of an institution. If individuals feel a sense of loyalty, he argues, then it is more likely that they will stay to press for a restoration of previous high standards or good performance. However, it is not made clear whether the use of voice at this stage is an alternative or a prelude to exit. This reference to loyalty is one of the weak spots of Hirschman's model. Whilst loyalty is used to explain the choice between the use of exit or voice, he also argues that the use of voice increases inversely to the probability of exit. This ignores any consideration of the importance of the ability to articulate grievances for voice, and the degree of mobility for exit. In the case of employees it seems no more likely that those who are trapped in a particular job or a situation which deteriorates, will use voice than those who are mobile. Without the right forms of protection, such as the right to express concerns through a spokesperson, exercising voice might make this employee's situation worse – an outcome which could deter them from making criticisms or contributions. In a critique of the exit-voice model as applied to the labour market, Boroff and Lewin (1997) suggest that rather than choosing voice over exit, those who are loyal will stay silent despite their grievances or dissatisfaction. However, whilst this is a valid criticism their own interpretation of this model also has flaws. They continue to overlook the issue of constrained employee mobility, and their data set is comprised of individuals who have filed a grievance, making their test one of ex-post loyalty. The probability of choosing voice over exit will also be affected by the costs of voice compared to exit and the probability of success. Both of these probabilities are increased when several individuals combine together to exercise their voice, with the caveat that as the group grows larger there may be a greater probability of free riding. In the case of a membership of an institution, rather than consumption of a product, forming a group protects individuals from retaliation and hence they may be more willing to make complaints. Formalisation of the role of voice will also help to reduce the costs of a response each time action is required to improve performance or standards. Consideration of mobility is often missing from discussions of Hirschman's

model. Those with little ability to find another source for the product (or another job) locally, or to relocate have little chance to exit the relationship. This lack of an exit option is likely to limit their use of voice. A final weak spot in the original Hirschman model, and one that is not touched upon in more recent discussions of exit-voice, is the assumption that voice should or can be used to restore conditions or performance to the original level. This implies that the original situation was pareto-optimal and that voice has no role in the fight for continued improvements, be they in products, services or working conditions.

The exit-voice model has an obvious application with respect to labour turnover; this application of Hirschman's model was first explored by Freeman in the 1970s (1976, 1978, 1980). By extending the model to the analysis of dissatisfied group members and their choice of voice or exit to employees, Freeman (1978) justified the examination of a subjective variable such as worker satisfaction by economists. Freeman's work contains little direct engagement with the philosophical underpinnings of Hirschman's model. Yet, whilst within the Hirschman model there is no conception of collective action, Freeman's application takes for granted the impossibility of individual activity to improve conditions. Applied to the labour market, a fall in utility leads to a choice between exit - quitting - or using a trade union to exercise voice.

Therefore the existence of, and choice between, voice mechanisms is of interest to both workers and their employers. The existence of voice mechanisms within a workplace presents the dissatisfied worker with a choice. Exit may entail costs in the form of lost economic rents and the need to search for a new position, so they may prefer to rely on voice to raise grievances, bring new issues to the bargaining agenda and establish a system of jurisprudence or regimen for dealing objectively with situations. Through these differing roles the trade union can come to represent a "dual authority channel", (Freeman: 1980, p 647). Firms can also benefit from the provision of voice channels. Vroom (1964) argues that encouraging participation can bring benefits because generating a greater sense of democracy will lead to coherent norms and therefore create a unified team. Worker satisfaction may be higher in the presence of a mechanism for manifesting discontent, and this may in turn feed into more tangible economic benefits for the firm. If the purported inverse relation between satisfaction and exit exists, then turnover may be reduced through

the establishment of voice mechanisms. Therefore, the firm will retain its firm-specific human capital and save on hiring and training costs. Turnover has indirect costs too; those involved in training and mentoring recruits are likely be less productive than when engaged in their normal tasks, a problem which is lessened by fewer separations.

Whilst trade union presence has traditionally been seen as necessary to persuade employers to treat employees fairly and offer the best terms and conditions, Freeman (1990) points out that it is not inconceivable that non-unions firms will offer their workers positive personnel and labour relations. This may form part of an anti-union strategy or a policy to improve industrial relations. Similarly the type of institution best suited to expressing voice may have changed over time. The history of the trade union movement in the US reveals the importance of creating independent voice mechanisms in order to generate employee confidence. Whilst works councils or company unions were not uncommon in US firms during the 1920s they did not embody the degree of independence desired by the workforce (Fairris: 1997), and dealt with shopfloor issues rather than collective bargaining. These mechanisms were associated with higher productivity and lower rates of injury, but during the depression employees saw that these forms of voice were limited and offered no chance to improve job security. As involuntary exit slowed so discontent grew. The New Deal of the mid 1930s gave support to workers' demands for independent voice. Fairris views post World War II developments in industrial relations negatively. He claims that relations became more formalised, which reduces the cost of exercising voice, and that trade union leaders became more instrumental. The government intervened again, though this time in favour of capital, to identify areas which they considered should definitely be subject to discussion, such as wages, and those which need not be, such as technical change. The 1990s, he claims, have seen the end of adversarial relations in the US, and unions are no longer the only suitable channel for voice. This is due to a change in technology and a more co-operative approach to industrial relations from employers.

The UK, and indeed many other nations, have seen employers attempt to foster a sense of unitarism within their workplaces (Boxall and Purcell: 2003). New approaches to employee involvement are evident, involving direct forms of employer-worker communication, indirect consultation, and financial involvement schemes. It is possible that

this shift in communication methods to more direct methods represents a desire to sideline trade unions; Morgan and Sayer (1985) argue that this was particularly true of Foreign Direct Investment plants springing up in 1980s. However, the drive for change may have come from both workers and employers, indicating a broader agenda than the side lining of trade unions. Representative mechanisms in particular may discourage high levels of involvement, whilst the new types of voice mechanism reflect a change in the characteristics of the workforce: employees may be less inclined towards mechanisms which treat them as a homogeneous mass, being more demographically diverse and better educated. At the same time the passing of the 1999 UK Employment Relations Act, with its (limited) support for employees' right to trade union recognition, indicates that trade unions are once again viewed as an important channel for voice.

Whatever mechanisms are used to channel voice it is vital that they command the confidence of workers. Whilst the type of voice mechanisms associated with Japanese industrial relations, such as quality circles and team working, have become widespread Park (1983) dismisses such fora as being purely motivated by the desire to boost profits without any form of power sharing:

> "participation in Japan aims at mobilising workers at shop-level and enhancing productivity (micro-economic goals). The participation in Germany is expected to reach equal distribution of power and influence in the whole society (macro-economic goals)" (1983: p13).

Kelly and Kelly (1991) point to the historically low levels of trust between workers and employers to explain poor industrial relations in the UK. New voice mechanisms, which offer more direct communication or gain sharing can theoretically result in a positive sum gain, but they may not live up to the theory (Ramsay: 1985). New more direct methods of communication, emphasising employee involvement, may conceal a desire to subjugate employees (Delbridge and Turnball: 1994). Communication mechanisms which fail to protect workers who raise grievances or concerns cannot reduce the costs of voice relative to exit. Schemes or plans which do not involve power sharing, and fail to instil confidence that any gains from improved performance will be shared, are unlikely to continue to

capture tacit knowledge. Terry (1999) reports on the collapse of non-union works councils in the UK, as a worsening of economic conditions resulted in redundancies, illustrating the need for employees to have independent voice mechanisms.

Hirschman's theory of exit-voice, though flawed, can usefully be applied to analysis of the employment relationship. The theory suggests that voice can bring benefits for both the employer and workers, though as emphasised, channels for voice must operate independently of managers to gain confidence and should at least act as a restraint to the arbitrary exercise of power by management. Failure to observe these requirements will make exit relatively more attractive. The discussion will now move on to look at the pattern of voice mechanisms in the UK over the last 20 years.

3. Themes and Hypotheses

a) The Pattern Of Voice

A number of typologies of voice mechanisms have been devised, grouping together separate communication and involvement channels on the basis of their characteristics, or potential benefits, or the degree of power sharing they entail. Of course, the simplest application of exit-voice to the employment relationship, as per Freeman in the late 1970s, would only consider trade unions. This reflects the assumption that voice can most successfully be exercised collectively, through formal power-sharing channels. However, trade unionism has been decreasing in many developed counties for some time and a number of new forms of voice have come to the prominence. Levine and Tyson (1990) made a thorough analysis of the benefits of different participation or voice mechanisms, devising a typology encompassing four categories: consultative; substantive; financial; and representative. Fora such as joint consultative committees (JCCs) and possibly team briefings represent consultative mechanisms, offering the employees chance to mention grievances and suggestions without any degree of power sharing. The trade union differs from the JCC in that it has a right to negotiate, at least over issues such as pay and working conditions. In this way it represents Freeman's "dual authority" (1980: p647) and falls into both the substantive and representative categories. Other forms of voice might be classed as substantive too, depending on their degree of influence. One such example

might be autonomous work teams, though this represents a narrow form of direct voice on quality related issues. The final category, financial schemes, has become increasingly prevalent in the UK, in the form of bonuses, profit share, share ownership or merit pay.

Marchington et al (1992a) developed a similar typology to classify employee involvement schemes, in that they too devised categories for representative and financial schemes. They also introduced two different categories, having identified a number of "downward" channels for communication of management edicts, such as use of the management chain, newsletters or cascade meetings. The corresponding "upward" category covered mechanisms such as quality circles, and possibly team briefings, designed to encourage problem solving and pass information up the hierarchy.

The trade union is the traditional channel for expressions of worker voice, constituting an indirect, representative form of communication between employees and their employer. The trade union has two roles: that of a vested interest; and to act as a sword of justice. To defend its vested interests the union undertakes to bargain collectively over wages at the establishment, and in acting as a sword of justice its shop floor representatives act as a channel for grievances and demands, and challenge any perceived unfairness. This does not seem to leave much room for the exchange of productivity enhancing ideas, which suggests that the benefits from using a trade union as the voice channel accrue solely to labour. However, as Freeman and Medoff explain :

"[O]ne reason for the lower quits under unionism is the dilution of managerial authority over workers by a system of negotiated rules and procedures in which workers have a right to appeal and obtain reversals of management decisions." (1984: p107),

which indicates that employers may benefit indirectly from a reduction in workers choosing the exit option. These lower quit rates will reduce companies' costs and should theoretically feed in to higher productivity levels. The jurisprudence role of unions identified by Freeman and Medoff (1984) probably goes further towards satisfying the sword of justice role of unions than the mere provision of grievance procedures.

JCCs are an indirect voice forum, which emerged in Britain following the recommendations of the Whitley Committee in the 1920s. These can operate on a company-wide or on a plant basis, in that way resembling the Works Council which is commonly seen in many mainland European counties. However, whilst Works Councils in Europe are legally mandated, and in many countries have powers of co-determination, the British JCC is typically a voluntarist institution. The rules of operation tend to be laid down by management, and the JCC traditionally only enjoys consultation not negotiating rights. This form of voice may offer tangible benefits to the employer, without the power-sharing associated with a trade union. For example, Morishima's (1991) study of the effects of Japanese consultative committees found information sharing positively affected firm profitability and employee productivity. However, workers may gain something from the presence of a JCC, grievances can be conveyed by representatives rather than having to be expressed openly, and after all:

"[t]he voice of a legally mandated works council may be weak compared to that of a union but it is still a voice that management will hear" (Freeman: 1990, p331).

The decisive factor in determining whether such an institution can work without legal support is the level of trust which develops between the employer and the workforce. The workforce is unlikely to use the JCC to raise grievances or offer suggestions for improvements if these fail to result in job security and gain sharing. Council representatives will be less well equipped to negotiate with employers than trained union stewards, so non-union councils facing crisis face two potential fates: union take over, or collapse (Terry: 1999). UK health and safety committees represent a form of JCC. They operate at the level of the establishment, but where unions have recognition their presence is mandatory (ACAS: 1994). By providing a formal arena for the expression of safety related concerns they are likely to satisfy a limited voice role.

As outlined by Freeman and Medoff (1984), US grievance procedures are most commonly found in unionised establishments, though they may be introduced by employers as part of a union-resistance campaign. The Donovan commission advocated a greater

formalisation of UK industrial relations, so it seems likely that WIRS will show a every high rate of incidence of formal grievance policies. The provision of grievance policies to enable dissatisfied workers to pass their complaints upwards is of fundamental importance in creating room for voice. However, without some form of supporting institution, or means to guarantee anonymity, the costs of exercising voice in this way will be too high for some individuals.

Changes in the type of voice mechanisms employed can be explained by the increase in product market competition, by the changing composition of labour - away from a homogeneous mass of males open to union recruitment, or more simply by a desire of managers to follow the latest trend in communication schemes. Others argue that the choice of voice channels follows cycles or waves of influence, according to whether employers or workers hold the upper hand in the employment relationship (Ramsay: 1977; Marchington et al: 1992b). During the 1980s a host of new types of employee involvement mechanisms were introduced (Leighton et al: 1991; IRS: 1993). The immediate aim of employers was to improve productivity by encouraging workers to share their ideas (Tillsley: 1994), but it was in part driven by the desire to generate a more unitarist atmosphere within firms. This unitarist approach to industrial relations was linked to the rise of human resource management and this required that firms moved away from reliance on representative fora in favour of direct communication, both upward and downward. This emphasis on direct communication fits with the increased role of line managers in running both production issues and personnel matters. The abandonment of collective voice channels was something that the UK government actively encouraged during the 1980s.

Drago (1988) defines quality circles as voluntary meetings between workers to discuss, analyse and solve problems common to the group, performing a role distinct from that of unions. As such they appear to be substantive, upward voice mechanisms, offering employers the opportunity to "heighten the contributions made by employees" (Tillsley: 1994, p211), and any tacit knowledge which is shared can strengthen the response to intensified product market competition. The realisation that workers have valuable knowledge is relatively new, prior to the 1980s managers throughout British manufacturing typically disregarded workers' knowledge of the labour process in problem solving

(Morgan and Sayer: 1985). Mechanisms such as quality circles may enable employees and managers to interact in an informal manner, and might suit a more highly educated workforce, suspicious of, or impatient with, representative fora. The use of quality circles has been criticised by Delbridge and Turnball (1994) on the grounds that there is no room for power sharing and concern for quality may translate into increased work intensity and pressure on labour. Cooke (1992) found that quality enhancement programmes were most successful, in raising value added per employee, when combined with union involvement as this guaranteed some benefit would accrue to the workforce.

Team briefings represent another new type of communication channel. Though they do not readily fit in to the Levine and Tyson (1990) typology, under the Marchington et al (1992a) classification, they probably act as both an upward and downward direct voice mechanism. However, there are no substantive rights attached to membership of a team, which is likely to deter full and frank communication. In line with this judgement, Marchington et al. (1992a) found that the vast majority of workers who took part in team briefings did not feel more committed to their organisation. In contrast the use of autonomous teams for production purposes indicates a degree of power sharing over a rage of issues. However, whilst teams have increased in use in the UK (WIRS: 1998), they are rarely granted autonomy.

Some employers make use of the management chain or newsletters to convey information. These downward voice mechanisms offer workers no substantive rights and seem unlikely to elicit worker suggestions or allow dissatisfaction to be manifest through voice rather than exit. Using the management chain or newsletters has the benefit of being cheap, and a quick means of passing information down the hierarchy though they are relatively unpopular with employees (IRS: 1993; Gallie and White: 1993). Marchington et al (1992a) found that the incidence of upward voice mechanism such as suggestion schemes and surveys was less common than downward forms. Whilst these have the benefit of providing protection through anonymity, again they do not offer substantive influence, nor the opportunity for direct exchange. However, Green and McIntosh (1998) found that these mechanisms were associated with greater effort, particularly as part of a package including representative fora.

Alongside their encouragement for individualised communication schemes, during the 1980s the UK government also encouraged greater financial involvement of workers in their firms (Marchington et al: 1992b). Organisations have continued to move away from collectively bargained non-contingent pay in order to reward individuals for their performance and align the management of human resources with pursuit of organisational goals (Heery: 2000). Employee voice may also be manifested through employee ownership of the organisation (Bonin et al: 1993). Greater financial involvement by workers has been established to boost firms' financial performance particularly where unions are involved in monitoring the distribution of benefits (Cooke: 1994). The involvement of trade unions ameliorates some of the ethical problems, lack of regard for equal opportunities and the transference of risk to employees, associated with contingent pay (Heery: 2000).

The findings of an NOP survey conducted in 1993 for the Department of Education and Employment found that 85 per cent of workers were covered by one type of voice scheme (Tillsley: 1994), but that many workers had access to multiple channels within their workplace. As new types of involvement schemes are devised and publicised it seems likely firms will introduce a range of mechanisms to deal with different workplace issues. But do all provide an opportunity for voice, a means of raising grievances and do they contribute to a sense of jurisprudence? Distinct from their typology, Marchington et al (1992a) break down these communication mechanisms into two contrasting groups: employee involvement schemes and participation mechanisms. They suggest that the motivations behind the introduction of institutions in each of these categories will differ. Participation implies a concern for democracy and power sharing. Employee involvement (EI) schemes will be chosen where employers seek to gain greater commitment and effort or to improve recruitment and retention, and where their use "do[es] not involve any de jure sharing of authority or power" (Marchington et al.: 1992a, p7). In support of this view, Gallie and White (1993) report that more than one of half employees surveyed believed that they exercised a low level of influence through EI at their workplace. In contrast, any firm wishing to successfully establish a collective fora must be prepared to hand over substantive responsibility.

a) Hypotheses On The Pattern Of Voice

The literature surveyed suggests that the analysis of the WIRS series will find a shift in voice mechanisms from collective to individually orientated over time. This will be mirrored by a higher incidence of direct schemes than representative fora in the cross sectional primary data. Financial participation will have become more common, and firms are likely to be using more than one involvement scheme.

b) Voice And Employee Satisfaction

Locke (1976) stresses that in addition to an emphasis on links between satisfaction and economic outcomes such as absenteeism and turnover and, potentially, productivity improvements, the relationship between worker satisfaction and well-being should also be explored. Positive levels of satisfaction have been associated with good mental health and longevity. Initially, interest in job satisfaction was concentrated amongst psychologists, with a number of studies conducted between the 1930s and late 1970s. Three separate schools of thought developed from psychologists' work: firstly, that extrinsic factors such as the physical and economic environment would determine satisfaction; secondly, the Hawthorn studies suggested that social and human relations would play an important role; thirdly, contemporary analysts have argued that the nature of work itself is important. This suggests that studies should clearly identify which aspect of job satisfaction they are examining. One of the complicating issues that arise from the approach typically taken by psychologists is that studies often rely on a comparison between actual outcomes and expectations when examining satisfaction levels. Such a comparison throws up the issue of recall bias if the expectations information is gained retrospectively. One way to deal with this issue is to use time series data.

Economists showed little interest in satisfaction as a dependent variable until the 1970s. Freeman (1978) was possibly the first economist to argue for the validity of subjective variables, such as self-reported satisfaction, on the grounds that this variable may capture non-quantifiable influences, perhaps related to labour market alternatives, physical conditions of work, or supervision, which otherwise would be missed in an estimation. Subsequently, many economists have explored the relationship between job satisfaction and relatively intangible outcomes such as commitment, as well as more quantifiable outcomes. Greater autonomy may generate higher job satisfaction and so lead to intensified efforts on

the part of the workforce (Miller and Monge: 1986; Hammer: 1988; Fernie and Metcalf: 1995). Satisfaction levels have also been shown to be correlated with future quits (Freeman: 1978; McEvoy and Cascio: 1985), and productivity levels (Clegg: 1983; Mangione and Quinn: 1975).

Some data sets permit job satisfaction to be disaggregated in to contentment with a variety of aspects of the job. Clark (1996, 1997) took such an approach using British Household Panel Survey data to examine demographic influences on forms of satisfaction. He confirmed the stylised fact of higher satisfaction for women, which is generally attributed to their lower expectations and a sample selection effect flowing from the fact that being the secondary breadwinner (usually) permits them greater freedom to exit unsatisfactory jobs. Taking this more discriminate approach to satisfaction, Clark found that women derive satisfaction from intrinsic job attributes and men from extrinsic, see Brown and McIntosh (2003) for a similarly detailed analysis of facets of job satisfaction. The success of this disaggregated approach should lead to similar caution when considering the impact of voice mechanisms on satisfaction. Different voice mechanisms may elicit higher satisfaction with specific aspects of the job. For instance union provision might be related to satisfaction with promotion and pay, whereas more modern, direct, communication methods may lead to greater satisfaction with the employer, or levels of autonomy.

Overall,

"(T)here is hardly a study in the entire literature which fails to demonstrate that satisfaction at work is enhanced or that other generally acknowledged beneficial consequences accrue from a genuine increase in workers' decision-making power" (Blumberg, 1968 p123).

However, whilst this quote suggests that voice is an incontrovertibly positive idea, most empirical work associates the presence of trade unions with lower satisfaction. It has often been claimed that there is a causality issue underlying this association between higher job dissatisfaction and union recognition. The US system for gaining recognition often entails a hard fought struggle between the union and managers, during which time the union will

emphasise the problems inherent in the workplace to justify their role. Similarly within the UK, it is rational for unions to stress the negative to generate higher membership. The irony is that whilst the presence of an independent forum for the exercise of voice is theoretically likely to boost dissatisfaction, it is only within pluralistic working environments, with some degree of power sharing, that the causes of dissatisfaction can be confronted. Bender and Sloane (1998) examine whether it is this form of politicisation in the UK which drives low satisfaction amongst union members; do unions spring up in the "worst" types of workplaces or do the least satisfied employees self-select into unions? Their results suggest that the industrial relations climate, which is shaped by the struggle for recognition and legitimacy, is the major explanatory factor of low satisfaction amongst union members. According to Borjas (1979) the dissatisfaction felt by union members in the US intensifies as they age. He offers two reasons for this: firstly, the effects of politicisation are cumulative; and secondly, the progressive flattening of the age-earnings profile exacerbates employees' dissatisfaction. He suggests that this should lead to the diminishment of the beneficial union influence on the quit rate after around 25 years of service. However, in view of the seniority bias in US remuneration packages, particularly the provision of pensions (Freeman and Medoff 1984), this seems unlikely.

There is little empirical work on the impact of non-union voice channels on job satisfaction, and what there is suggests a limited impact. Clark (1996) built on earlier work (Locke: 1976), exploring the importance of relative pay in determining satisfaction, concentrating on the impact of bonuses and share ownership. Whilst in cross tabulations bonuses and share ownership were positively associated with satisfaction with pay, this result disappeared under parametric analysis. The introduction of quality circles was linked with higher levels of satisfaction and a fall in the intention to quit in US workplaces (Griffin: 1988). However, the effect lasted only 18 months at which point levels of satisfaction fell to their original level. In the UK 76 per cent of managerial respondents to an IRS survey (1993) believed that the use of some form of voice had increased job satisfaction. At the same time workers surveyed by Marchington et al (1992a) seemed to be more cynical; 44 per cent of employees surveyed believed their employer used communication mechanisms to boost efficiency, whereas only 15 per cent thought it was

driven by the desire to boost satisfaction. This underlines the importance of trust if voice is to have a beneficial impact.

b) Hypotheses About Voice And Employee Satisfaction

Different voice mechanisms are likely to convey differential benefits to workers and their employers but collective voice channels tend to have a negative relationship with satisfaction. Therefore the emergent hypothesis is that individualistic measures will have a more positive relationship with satisfaction than collective ones.

c) Voice And Employee Turnover

The exit-voice model of the labour market suggests that labour turnover can be reduced through the use of certain communication channels. This concern for exit assumes that labour turnover is a negative outcome. If there are substantial costs to hiring and training recruits, and an associated impact on productivity levels, then it is likely that employers will seek ways of reducing voluntary quits. Low labour turnover is a beneficial outcome if it encourages firms to invest in human capital, increasing the flexibility with which labour can be employed, thereby potentially improving financial performance and the interest level of tasks. Employers may also be interested in reducing the probability of poor job matches, and thereby lowering exit (McEvoy and Cascio: 1985). This however, requires the use of clear communication or voice before the match is made. Workers may also seek means of expressing and rectifying low utility as an alternative to exit, and as a means of defending any economic rents or returns to job-specific skills which they have amassed in their posts.

A host of studies, predominantly carried out by psychologists, have examined the impact of worker satisfaction on the propensity to quit. These studies often use the reported intention to quit, rather than an actual separation, primarily because they do not have time series information, though this intention is likely to be inflated by disgruntled employees. Generally satisfaction and quits are negatively related, however this relationship is not found in this data set. A review of these studies, and a discussion of the issue of endogeneity between satisfaction and turnover, is provided in Brown and McIntosh (1999).

Such was the weight of evidence from existing studies that Locke (1976) argued further research on the relationship would only be valuable where it disproved the relationship. This chapter will not attempt to model the relationship between satisfaction and exit, but concentrates on the relationship between forms of voice and quits.

Elger and Smith seem convinced of the benefits provided by a voice alternative to exit. The lack of voice in Telford workplaces:

"while giving managers undisputed authority in the workplace, [it] left exit as the only obvious option for the workers and could also feed into festering grievances amongst those workers who remained" (1998, p283).

The result being manifested as high absenteeism, and a lack of commitment as well as quits.

Freeman (1980) has conducted a number of investigations into the relationship between exit and voice, represented by trade unions, and was the first to take individual data rather than more aggregated data. He also took widest possible interpretation of exit: looking at separations, voluntary quits and tenure. The US union wage differential is sizeable, and so it is necessary to control for this monopoly or vested interest effect, when looking at unions and quits. Freeman and Medoff (1984) also introduced a number of controls for the union impact on the provision of fringes, such as pensions, which is also very sizeable in the US. The voice effect outweighed the monopoly wage and fringe effect for all workers, but especially for older labour. Of course the apparent effect of unions in dampening separations could be due to a selection effect: more stable individuals may be more likely to join unions. Using longitudinal analysis of the same group as they move between different environments, Freeman (1980) was able to prove that exit was reduced by voice rather than a selection effect. Having found repeatedly that unions lowered turnover, Freeman (1980) and Freeman and Medoff (1984) emphasised the importance of unions in establishing jurisprudence and grievance systems within the workplace. Freeman (1980) emphasised the important role grievance procedures play in allowing the exercise of voice. Rees (1991) develops this theme, testing the impact of different strength grievance

procedures in the US. Only very strong mechanisms, incorporating automatic recourse to binding arbitration, reduce exit significantly. This emphasises the need for a degree of power sharing if voice is to reduce exit.

Miller and Mulvey (1991) undertook a similar analysis with data on young Australian males. Despite the formal nature of the Australian industrial relations network they argue that there was still a role for trade unions. Whilst pay awards in Australia cover all workers, the protection afforded by the grievance system is only enjoyed by members, so this is a particularly robust test of the voice effect. They found that one third of the difference between quit rates in unionised and non-union plants was attributable to voice and, as found by Freeman and Medoff for the US (1984), the impact of unions was even stronger where workers expressed dissatisfaction. They repeated their analysis, controlling for voluntary and involuntary quits. Most of the reduction in exit comes from the ability of unions to suppress lay-offs rather than lowering worker-initiated quits. Wooden and Baker (1994) also used Australian data to explore the exit-voice relationship. They argued that with multiple unionism in Australian workplaces, and the free riding of non-members, recognition or membership may not be the most accurate reflection of the strength of union voice. Instead they used density and the number of representatives as measures of union voice. Whilst unions were associated with lower separations, non-union forms of voice of EI had no influence. This implies that it is not just the presence of voice mechanisms but their power which is important. Gordon and Denisi (1995) are also concerned to control for the possibility that the benefits unions offer may accrue to non-members, for instance in the US unions are forced to deal with the grievances of non-members. They therefore use workplace level data to contrast intention to quit and quit rates of unionised and non-unionised employees. Their results suggest that the industrial relations' climate was less favourable in the presence of unions, and that union membership did not affect either quits or the intention to quit.

As illustrated by Freeman (1980) and Freeman and Medoff (1984), another approach to the issue of exit is to look at tenure. Using tenure as an explanatory variable in a separation equation brings problems of endogeneity, unless the variable can be instrumented. Both Blau and Kahn (1981) and Jovanovich (1979) identified an inverse

relationship between tenure and exit. It seems likely that those who are dissatisfied or who have made a poor job match will exit relatively early. Cahuc and Kramarz (1997) analysed the impact of the French accord d'enterprise, a voluntary workplace agreement which gives labour a degree of autonomy over hiring and training and working conditions. This is associated with longer tenure.

Early interest in the role of non-union forms of voice was shown by Kraft (1986). This chapter is distinctive in examining the impact of voice in German workplaces, using individual level data on males from the 1970s. In contrast to most evidence, he found that individual rather than collective voice was likely to lower exit. Yet overall he stressed the importance of workplace climate and the quality of managers, arguing that good managers could communicate successfully anywhere and using any system. Briefing groups constitute a more individualised, direct form of voice than offered by unions. Three quarters of UK respondents claimed there was no relationship between the use of briefing groups and labour turnover (IRS: 1993).

Wilson and Peel (1990) look at the relationship between exit and voice, using both representative and financial forms of voice, with a sample of blue-collar workers in UK engineering plants from the late 1970s and early 1980s. Arguing that recognition does not give enough information about the strength of voice, they develop a complex index for unionisation, reflecting the presence of a closed shop, multiple unions and levels of density. Financial involvement is proxied by the existence of share option schemes or profit share. Exit was lowest in the presence of strong union voice, although financial schemes have a weaker though significant relationship with quits. The data did not allow for analysis of the direction of causality: did the financial schemes arise from or assist lower exit rates? Wooden and Baker (1994) also found evidence that individualised voice and profit sharing could reduce exit where they increased worker identification with the firm. In order to encourage the exercise of voice rather than exit, the relative costs of voice must be lower than those of exit and there must be some hope of successfully improving conditions or achieving change. This will require that voice be channelled through formal, power-sharing schemes. The relative lack of empirical work on the link between new forms of individually

oriented voice and exit as compared to the work on exit and unions could reflect a sense that these are not really substantive mechanisms.

c) Hypotheses About Voice And Employee Turnover

We predict that collective voice mechanisms, which offer protection, relatively low costs and - if unionised - wield some power, will be associated with lower quits as they offer an alternative to exit. Whilst financial forms of involvement are likely to be associated with lower quits, other individual voice mechanisms will be unrelated to separations.

4. Data

WIRS

The Workplace Industrial Relations Surveys (WIRS) series comprises four in-depth analyses of workplace practices and conditions undertaken in 1980, 1984, 1990 and 1998. These surveys were funded by a consortium of the Department of Trade and Industry, the Economic and Social Research Council, the Advisory Conciliation and Arbitration Service and the Policy Studies Institute. In this chapter the management questionnaires from three separate Workplace Industrial Relations Surveys, those of 1980, 1990 and 1998 are analysed for evidence of a shift from collective to individualised voice mechanisms. These Surveys are well known in Britain, and represent the major source of secondary evidence on workplace change over the last twenty years. Whilst a detailed explanation of the sampling frame and methodology is provided for each individual survey, one major factor of note is the shift to include smaller workplaces in the most recent, 1998, survey. Whereas the sampling frame was comprised of organisations with at least 25 employees in the surveys of 1980, 1984 and 1990 that of 1998 broadened the pool of workplaces to include those with ten or more staff. Smaller workplaces have traditionally been less likely to have formalised voice procedures, such as trade unions or direct methods of communication (Gallie et al: 1998), although it is likely that they will have some form of grievance procedure. In order to generate comparable samples over time those establishments with fewer than 25 workers in the 1998 survey will be excluded.

We investigate the incidence of unions, JCCs and health and safety committee representing collective fora. Direct methods are represented by fora which encourage employee contributions: quality circles, surveys, suggestion schemes; and schemes to formalise communication: team briefings, newsletters, cascade meetings, or systematic use of the management chain. The use of appraisals indicates a direct relationship between employer and employee, and offers opportunities for personal exchange of ideas, so the pattern of their use is reported. Share ownership/profit share schemes also represent a channel to increase employees' engagement, and so their incidence is presented. There are some changes in the range of issues put to managerial respondents across the surveys. In particular the direct mechanisms above were added to the questionnaire for the first time in 1990. The change in questions reflects the expected change in the mechanisms used in establishments, indicating a shift from collective to individual voice. In order to look clearly for a shift from collective to individual voice, two hybrid variables are constructed. The collective hybrid variable indicates whether the establishment uses a JCC, a health and safety committee or recognises a trade union. The presence of such fora would give employees anonymity when making complaints or suggestions, and the collective weight of employees should wield greater influence over the employer. The individual or direct hybrid variable indicates the establishment uses one or more of the following: profit share or share ownership; newsletters; quality circles; team briefings; surveys; suggestion schemes; cascade meetings; or systematic use of the management chain.

Primary Data

The primary data was originally collected in order to monitor the implementation of the UK's first national minimum wage, a full background is given in appendix A1. This data set is fantastically rich in information and looks at a section of the labour market not usually studied: low paying firms using mainly women. It contains 52 branches of the five national companies in the hotel, food retail, food manufacturing, leisure and quick service restaurant (QSR) industries, which are spread across five geographic regions: West Midlands, Yorkshire, the South East, South West and North West. What makes this data set particularly interesting is that it is comprised of predominantly service sector establishments, in contrast to the continued focus on male manufacturing workers within

industrial relations research. These companies are clustered at various points in the lower quarter of the earnings distribution, which again makes the data set distinctive. A wealth of data are available. Access was granted to the computerised payroll records of each site for all but the leisure company, providing information on start dates, occupational grades, tenure, pay rates, working hours and where applicable leave dates and reasons for leaving. Data concerning other personal characteristics such as education, ethnic and parental status and previous economic state were collected using employee questionnaires, distributed in late 1996 and early 1997 to workers at each site. These have then been mapped in to company payroll data. Each site manager also completed a survey outlining industrial relations procedures at their site, particularly the voice mechanisms used, and offering comparisons of their wage and labour turnover rates with similar local employers.

The site managers' surveys tell us whether team briefings, cascade meetings, newsletters, appraisals, and any form of bonus scheme are used. Whilst in general firms may make a decision centrally about whether or not to recognise trade unions, this is not universally true of this data set. Other voice mechanisms are also selected at local level. The issue of union presence is more complicated. As will be shown in later analysis of the WIRS data, union recognition has traditionally been very low in both the hotel and restaurant sectors, and quite low for the leisure industry. This influenced the question that was put to site managers. Those managers at the leisure and restaurant chains were merely asked if they had any union members at their site. Uncharacteristically for the food manufacturing industry, the company from this sector did not recognise unions until 1999, so they were asked the same question. Whilst the presence of union members does not imply a form of voice, the legal support afforded to members, whether their employer recognises a union or not, may make them willing to speak out about grievances and problems. In contrast, managers from the retail and hotel chains were asked if they recognised trade unions, reflecting that their companies do not hold a policy of across the board refusal to recognise.

In their exhaustive study of union effects, Freeman and Medoff (1984) illustrate that it may be necessary to control for the fringe benefits which unions may bring, in addition to the wage differential accruing to their monopoly wage power. Most of the industries

covered in this chapter are not traditionally associated with widespread fringe benefit provision. The site managers' survey outlines whether or not they offer such fringes as free or subsidized meals, transport or childcare. Childcare provision was not offered at any site in the sample and few enjoyed fringes in the form of transport or meals. No information on pensions is available. Therefore no control is made for union monopoly power, other than to control for relative wages.

Whilst no claims are made for the representativeness of this study for the whole economy, it may be reassuring and interesting, to contrast this primary data set with a larger sample. Table 1 compares the data set used in this chapter with information for the same sectors from the 1997 quarter 1 Labour Force Survey (LFS). The LFS is a nationally representative survey of around 60,000 households, sponsored by the Department for Education and Employment, which is repeated every quarter. The companies used in this chapter are not particularly representative of their sectors. Tenure in particular is shorter in the primary data set. This is probably explained by their greater use of young workers. Retail, hotels and the QSR chain employ younger workers than suggested by industry-wide figures, though again the QSR deviates further from the LFS industry means. Whilst the proportion of female workers employed by our hotel firm is roughly equal to that of the hospitality industry as a whole, the QSR chain employs more males than predicted; retail and leisure use more women than the LFS mean. The payroll characteristics for food manufacturing also diverge markedly from those of our national data sample. Workers at the food manufacturing company are younger, and are far more likely to be male than predicted by LFS. Employee surveys also show that the food manufacturer is a much greater user of previously unemployed labour than the other four firms. This reflects their greater use of male labour: males being much more likely to be registered unemployed between jobs than women.

Table 2 presents the mean hourly wage of each of the five firms. The table emphasises the spread of wages across sectors within services and illustrates the low paying nature of the firms in our sample, reflecting the lack of skill required for most of the jobs offered in these firms. The LFS hourly rates for these industries are on the whole significantly higher, excepting the hotel industry which is roughly equal. Wages for food

manufacturing and leisure tend to be far higher than those offered by the firms studied here. The low level of wages probably reflects the high use of female and young labour across the service sector firms in the primary sample. The food manufacturer uses a large number of workers from ethnic minorities which could explain their very low pay rates. As we discuss later, both actual and relative wages are likely to impact on both workers' satisfaction and their decision to stay with the employer. Information from the individual site managers provides us with a view about the level of relative wages offered by each employer. Across the five firms more managers view their wages as higher than their rivals' than lower, but there are those who believe their wages are much worse than average in their local area. These tend to be in workplaces in the North West. The retail chain reports its relative wage levels more favourably than other firms; their managers view their wages as a little or a lot better than those offered by rival employers in 55 per cent of cases. Wages are likely to vary with location. The same questionnaire asked managers to classify their site as city/town centre, on the edge of town, semi-rural, or other. The probability of reporting wage performance greater than average is 9 per cent higher for sites on the edge of town rather than in the centre, though this may reflect the tendency of large retail stores to cluster on the outskirts of towns.

The questionnaires elicited information about workers' job satisfaction. As argued by Clark (1996), levels of satisfaction will vary according to the exact question which is put to workers. There are numerous aspects of any job with which they may be differentially content. This questionnaire asked for measures of satisfaction against eleven specific aspects of the job, and a question relating to overall satisfaction. These were measured against a likert scale, taking a value of one for strong agreement with the statement to five for strong disagreement. Higher numbers therefore represent higher levels of dissatisfaction (with the exception of the tiredness question, which is clearly a negative job attribute). The full range of questions relating to satisfaction are presented in table 3, along with the mean response to each by company. The first five questions correspond to the context of the job, the next five the content, and the final two straddle both categories. The context questions have higher, more positive ratings than content questions. This suggests that such workers are looking for work which satisfies their need for social interaction rather than a challenging career. This may be due to the nature of the sample: it is a low wage, largely

female data set. This chapter employs the statement "All in all I am satisfied with the job" as its one measure of satisfaction. A detailed discussion of the variation in satisfaction according to the aspect of the job considered, using a version of this data set, is offered by Brown and McIntosh (2003). An examination of mean responses to this question reveals that workers at the restaurant and retail chains are the most satisfied overall. However, it is worth noting that the mean level of satisfaction at each company is positive. As outlined, the information on overall satisfaction takes the form of a categorical variable. In order to make the results comparable to those of other studies on satisfaction (Bender and Sloane: 1998), the responses to the question "how satisfied are you overall" are conflated into a dummy variable for regression analysis. This provides coefficients which are easier to estimate and to interpret. This new variable, "satover", takes the value one for those respondents who are very or quite satisfied overall. As the dependent variable is a dummy variable, we are calculating the probability of a positive response given other characteristics, so ordinary least squares regression will not be appropriate. The decision to use logit or probit generally reflects convenience and the assumed distribution of the dependent variable. This chapter will use probit techniques.

Most previous studies of satisfaction have relied upon national samples which cover workers across a variety of different industries and workplaces. Wooden and Baker (1994) reassert that workplace level study is the most appropriate as non-union workers will benefit from a union wage premium and policies such as grievance systems which maybe introduced at the behest of unions. This highlights another strength of this data set; by using a data set of individuals across a limited number of companies and sites it maybe possible to capture the effect of workplace characteristics, such as working environment. In particular using a data set of this nature means that we have access to information about the voice mechanisms operating at each site. However, in mapping site level data to individual data we are mixing the level of aggregation. Thus the incidence of voice mechanisms will be correlated within a site but not across sites. Whilst this will not affect the size or sign of the coefficients, to ensure that this does not bias the standard errors, it is necessary to specify in regression commands that the data are clustered by site.

In choosing to look at labour turnover one must decide which definition to use. Mowday et al (1982: p109-110) find that there are seven possible dependent variables to use when examining the turnover issue. In his own analyses of this phenomenon, Freeman (1976, 1978, 1980) chose to look at separations, quits and tenure to underpin the robustness of his approach. In particular, many studies have highlighted the difficulty in distinguishing between involuntary and voluntary turnover, see Lucifora (1998). McEvoy and Cascio (1985) suggest this is due to data limitations. As the turnover costs to a firm are the same whether the individual quits or is dismissed, separations are generally undesirable. A second round of payroll data was obtained from both the retail and the hotel chains approximately 18 months after the first. This revealed which of the original respondents to the questionnaire had separated from the firm, when they had left and most importantly it provided the reason offered for leaving. The conclusion of a temporary contract is classified as a voluntary termination, as is the departure of an employee who feels the employer has "forced" them to resign, however, it must be remembered that it is not always possible to distinguish between genuine voluntary separations and those that have been forced. Therefore, for robustness two different separation variables are estimated. The first is a standard dummy taking the value of one for all who left between the two data points, results for which are reported but not fully discussed. The second distinguishes between those who left "voluntarily" from those who did not and re-estimates the probability of separation. It seems likely that the two results will differ. Both the companies in this smaller more detailed sample are amenable to union recognition, so the union variable is a straight dummy representing recognition by site. As unions are customarily able to prohibit discriminatory actions on the part of employers and unjustified redundancies, we expect to see a negative union association with overall separations. The relationship with voluntary turnover may be weaker. Another voice mechanism variable has to be changed at this point. All the remaining branches use team briefings to communicate with their staff, so this variable cannot be used in the estimation. However, the original site questionnaires in which managers outlined which of the voice mechanisms they used, provide information on the frequency of team briefings. Therefore we generate a new variable that indicates weekly or fortnightly use of such meetings, which is named "regular team meetings".

The quality of this reduced data set is superior to the first; much more payroll information is available. Sample means for the larger, satisfaction, and smaller, separations, versions of the data set are presented in table 4. Although we have lost three firms from the original sample, according to the 1997 Labour Force Survey, the proportion of the employed labour force employed in the sector represented by the two remaining firms is around 15 per cent. In order to exploit this additional data fully two additional pieces of information were mapped in, replacing the regional proxies used in the satisfaction estimations. The median wage for each travel-to-work area, from the 1996 New Earnings Survey, was added allowing the exact calculation of the hourly wage relative to the median in the same travel to work area. Information on the local unemployment rate for that travel to work area was also added from the JUVOS data set. This is helpful because voluntary separations will be influenced by the range of alternatives, which tend to move pro-cyclically (Burgess and Nickell: 1990).

5. Results

a) The Patterns Of Voice In WIRS

Table 5 reports on the incidence of a number of voice mechanisms, both collective and individual, across all industries using WIRS 1980, 1990 and 1998. This suggests that collective voice measures have fallen whilst individual ones have increased, most notably financial schemes. Tables 6 and 7 then examine the patterns of voice mechanisms in the sectors used later: retail, leisure, food manufacturing, hotels and restaurants. The patterns across the firms used vary, and are quite different to that across the economy as a whole, with financial schemes proving very popular with all but the leisure organisation.

The 1980 Survey was dominated by concern for union institutions and their influence in workplaces, indicating that recognition was taken for granted and that industrial relations was assumed to be based on collective relationships. Collective voice mechanisms such as trade union recognition or JCCs were relatively common, being exhibited in two thirds and one half of the sample respectively. Given the mandatory requirement to consult over health and safety where unions enjoyed recognition, it is not

surprising that well over one half had a designated committee for such matters. The incidence of the hybrid variable, constructed to indicate employee access to a representative voice forum, shows 84 per cent of establishments recognised a union, or used a JCC, or a health and safety committee. Around 90 per cent of establishments had schemes to deal with collective or individual grievances. Following the Donovan committee's recommendation that firms formalise their industrial relations this is only to be expected. Very few survey questions broached the subject of more direct forms of communication between workers and their employers, or mentioned the concept of employee involvement. The one direct form of involvement which is explicitly covered in the 1980 survey is the use of either a profit share or share ownership scheme; only 11 per cent of establishments had either. The survey did ask managers if they had made efforts to boost employee involvement over the last three years. Whilst it is not made explicit what these measures might entail, one third of the sample had seen an effort to increase employee involvement.

By the time of third survey, 1990, the landscape of industrial relations had changed quite markedly. Trade union density had fallen sharply and government legislation[1] in 1985 had helped to make the concept of employee involvement much more familiar. Therefore a raft of questions looking at formal, direct forms of communication were introduced to the questionnaire, along with mechanisms to involve employees and capture their tacit knowledge. Perhaps spurred by government encouragement for the concept of employee involvement, half of all respondents claimed to have taken measures to increase the involvement of their staff over the last three years. The survey asked about the usage of direct communication mechanisms such as the management chain, newsletters, team briefings, and cascade meetings. These were employed by between one half and two thirds of respondents. There was less usage of methods to elicit workers' ideas: between a quarter and a third used suggestion schemes, surveys or quality circles. Share ownership or profit sharing schemes had become much more common, increasing fourfold. Overall, 95 per cent of establishments used at least one direct form of communication or involvement. Collective voice mechanisms had become slightly less common, which Gallie and White (1993) argue reflected the changing composition of workplaces, with new sites unlikely to establish fora such as JCCs. However, 82 per cent of organisations still used at least one form of collective voice.

Union recognition declined between 1990 and 1998, as did the incidence of health and safety committees. However, the same proportion of workplaces claimed to have a JCC in both surveys and overall more than 70 per cent of establishments used one form of collective voice. Establishments did however reduce reliance on collective grievance policies. Whilst almost all plants used one or more forms of direct voice, there is variation by form: some mechanisms became more common and others less so. The use of team briefings and surveys rose very sharply, with almost 90 per cent and 55 per cent of respondents, respectively, stating that these were used in their workplace. Cascade meetings and suggestion schemes were less common, but use of other methods proved fairly stable across the two surveys. Again around 50 per cent of respondents claimed to have taken efforts to boost employee involvement, though this time the question referred to the last five years. This suggests employers are thinking hard about the best way to get their message to employees and to use workers' ideas to improve operations. The most striking difference is in the use of staff appraisals. The 1980 survey did not ask about their usage, but incidence rose from 38 per cent of establishments in 1990 to more than three quarters in 1998. Again, this suggests a desire to get the most from employees and to develop direct relationships between staff and employers.

We use WIRS data to set the context for the following company level analysis. The incidence of voice mechanisms across the five sectors, retail, food manufacturing, leisure, hotels and restaurants has varied widely, see tables 6 and 7. Retail has consistently had a slightly lower incidence of collective mechanisms than the general picture given in table 5. The latter two surveys show that the use of direct communication and involvement methods was more popular than the use of collective fora. Data for 1990 show the retail industry introduced direct methods sooner than others, however by 1998 they were in line with average usage in all but one area. Profit share and share ownership use is much higher in retail than in other industries, and has been so across all three surveys. The major supermarkets all emphasise the importance of financial involvement in their recruitment literature. Initially food manufacturing exhibited a high reliance on collective fora, with all far more common that the WIRS average. Although this reliance has dropped over time, the

incidence of union recognition, JCCs and health and safety committees still exceeds the average pattern. This is unexpected given the steep decline in recognition of unions in manufacturing (Cully et al: 2000). The most divergent pattern in this industry is in the use of share ownership or profit share schemes. Usage of financial involvement was much higher than the average in 1980, and remains more common. Other forms of direct voice and communication are not far out of line with the WIRS averages. The hotel and restaurant sectors fall within the same industry classification. Both these two sectors and leisure are areas traditionally associated with very low union recognition, but the tables show they have also continually exhibited a low usage of JCCs or Health and Safety committees. All three sectors show a lower than average effort to boost employee involvement, so it is unsurprising that their use of direct communication and employee involvement mechanisms lags behind the average. Share ownership or profit share schemes are well used however, particularly in the hotel/restaurant sector. The use of formal procedures for both individual and collective grievances within hotels and restaurants and leisure lagged behind the overall pattern, though there has been some convergence over time. This suggests a lack of sophistication on the part of employers in these sectors.

These tables indicate that use of individualised forms of voice mechanisms has increased rapidly. However, the WIRS data fail to confirm one of the major hypotheses. The use of individualised forms of communication and engagement does not seem to have increased hand in hand with a fall in collective fora and procedures. Overall, whilst union recognition had fallen, most establishments in the sample seemed to be increasing their reliance on direct voice mechanisms and retaining some forms of collective representation. We categorise the establishments with union recognition, a JCC or a health and safety committee as having some form of collective voice. Those with direct channels to management or formal communication mechanisms are categorised as having individualistic voice. In 1980 the only direct involvement method covered by WIRS was the use of share ownership or profit share schemes. Correlation coefficients reveal that these individual and collective hybrid variables were insignificantly correlated in 1980[2]. By 1990 the hybrid individual voice variable was more meaningful, given the addition of questions about direct communication. The correlation coefficient is small but significantly positive, which suggests that establishments were likely to use both collective and individual

methods of voice. By 1998 this positive correlation had increased slightly, suggesting that establishments often choose to increase methods of communication rather than to substitute new more direct methods for more traditional representative mechanisms. This accords with the view that direct communication and involvement is not a replacement for trade unions, but reflects the reality that organisations which see the advantages of collective fora will appreciate the benefits of new direct mechanisms (Gallie et al: 1998). At the same time it leaves a sizeable proportion of workplaces who choose not to develop any formal voice mechanisms.

The Pattern of Voice Across the Primary Data

This data set covers five different employers operating nationally in the food manufacturing, retail, leisure, hotel and fast food industries. Table 8 reports the pattern of different voice mechanisms across the five companies and 52 different sites as reported in 1997. Using categories consistent with the most recent WIRS data set, information is available on the usage of team briefings, cascade meetings, newsletters, appraisals. Whilst the use of bonus schemes is not strictly comparable with WIRS information about profit share and share ownership schemes, it does at least provide some insight into the spread of financial involvement across these firms and will have a similar motivational effect. As mentioned previously, the issue of union recognition is more difficult to address with this data set than with WIRS. Only the hotels and retail chain managements consider union recognition, so managers at sites of the other companies are asked whether they have any union members amongst their staff.

The most common form of communication is the appraisal. Whilst the most recent WIRS found around four in five establishments had introduced appraisals, only one of the 52 sites under study here, one of the food manufacturing sites, do not use this form of employer-employee communication. However, whilst this is a popular communication channel it is not a meaningful channel for voice. Appraisals allow for discussion about an individual's performance and development, they do not cover wider issues, and without the protection of a representative the employee may well limit their critical comments. Use of bonus schemes as a form of involvement is popular with the hotel, leisure and restaurant

chains, however, none of the food manufacturing plants use one. All the non-union forms of voice in the primary data set correspond more closely to Marchington et al's (1992a) downward forms than any other category. The use of team briefings is extremely common, with across the board usage in the hotel, retail and leisure chains. The incidence of cascade meetings, meetings where management pass down information to the entire workforce, varies quite widely. The baseline WIRS figure for the use of cascade meetings was around 40 per cent, which is approximately the same rate of usage as shown by the hotel chain. Both the restaurant chain and food manufacturer show a higher rate of incidence than this, whereas the leisure chain is much less likely to use them. The retail chain does not appear to use cascade meetings at all, which might reflect the difficulty in getting all staff together away from the store. The use of newsletters to convey information to staff falls well below the economy wide average, 60 per cent, suggested by WIRS. Only the food manufacturer makes good use of this method of communication.

Recall that we have two distinct questions relating to unionisation: one about recognition and one about the presence of members amongst the staff. Union recognition is higher than average at the retail chain but about the figure we would expect at the hotel chain. The figures for the membership amongst employees at the food manufacturer and leisure chain look plausible, but the finding that there are no union members across the staff at all 26 quick service restaurants is surprising and may reflect the youth of their employees.

We hypothesised that WIRS data would show that collective voice mechanisms had been replaced by institutions for direct communication and employee involvement. This was not the case. There was some fall in the use of collective fora, and a very significant rise in direct channels of communication and involvement. However, organisations which use collective fora tend to use direct mechanisms too. The industries corresponding to firms in the primary data sample used fewer collective mechanisms than the average, and most showed greater use of profit share and share ownership schemes. Food manufacturing differed in that it was more reliant on trade unions and committees than the economy-wide average. The primary data set had information on a limited number of voice channels: unions, team briefings, cascades, newsletters, appraisals and bonuses. Direct forms in general were more common than union membership or recognition, though the methods

used are downward and limit the contribution of employees. Appraisals were almost universally used, though we do not focus on these as they have not featured in the voice literature before. As predicted, bonus schemes were popular across the four service industry firms, and most sites are choosing to use more than one form of voice mechanism.

b) Voice And Employee Satisfaction

We now examine how overall job satisfaction is related to the presence of different voice mechanisms. Table 3 reported satisfaction rates in response to a range of question about aspects of the job. This showed that employees were enthusiastic about most aspects of the job, with the notable exception of their pay. Answers to the statement "all in all I am satisfied with the job", ranged between 2 and 3 which represent slightly positive responses. In table 9 the mean responses to this statement are presented, according to whether or not the employees have access to each voice mechanism in turn. The mean satisfaction scores of those with and without each form are then subject to t-tests. The t-test values in column 3 indicate that overall job satisfaction is significantly lower where sites use cascade meetings and newsletters to communicate and involve their employees. The use of bonuses however, is significantly associated with a higher level of job satisfaction. It is interesting to note that neither of the union variables shows any significant relation to levels of job satisfaction. Table 10 provides a more detailed analysis of satisfaction levels by voice mechanisms. We are now able to see the proportion scoring satisfaction as 1, 2, 3, 4, or 5 according to whether they have access to each voice mechanism. Responses tend to be neutral, but the table is of interest mainly because it shows that a higher proportion of respondents claim to be very satisfied with their work where the site has union members or recognition than any other form of voice. So whilst the use of direct voice and communication is more common than union recognition in this data set, unions are positively related to the highest level of satisfaction with work.

The final analysis, before commencing parametric estimation, is to look at correlation coefficients for the relationship between satisfaction and voice. Responses to the question "how satisfied are you overall" are conflated into a dummy variable taking the

value one for those respondents who are very or quite satisfied overall. This newly constructed dichotomous satisfaction variable, satover, is used in our correlations. The coefficients and standard errors are reported in the top row of table 11. The results are inconsistent with the cross tabulations of tables 9 and 10. Whilst high levels of satisfaction were reported in sites with union members or recognition in the previous table, there is no significant correlation between the two variables. Bonus schemes and cascade meetings are both significantly positively associated with worker satisfaction. Bonus schemes can provide a tangible reward for hard work, so this relationship is to be expected. However, cascades do not offer a mechanism for two-way dialogue, merely the chance to receive information from managers. Newsletters also represent a downward channel for information yet their use is negatively correlated with satisfaction. These results are inconsistent with those found previously. They suggest that direct mechanisms are more likely to be positively related to satisfaction, and that there is no relationship between collective voice and satisfaction. It will be interesting to see if parametric investigation clarifies the influence of unions on satisfaction.

As stated above, in order to make the results comparable to those of other empirical studies of satisfaction we use a dummy dependent variable, therefore ordinary least squares regression will not be appropriate. Instead the estimation will take a probit format. The equation to be estimated takes the form:

Prob (sat) = aX + bY + CZ + e   **Equation 1**

where X is a vector of personal characteristics, Y represents a vector of external influences such as the relative wage and region - which can proxy for unemployment, and Z represents the vector of voice mechanisms, e represents the disturbance term, which we assume to be normally distributed to justify the choice of a probit over a logit function. We also include dummies to indicate which is the employer in the voice mechanism vector. Whilst the coefficients from this regression will indicate which explanatory variables yield a significant influence on worker satisfaction, they cannot tell us of the exact size of the influence. Therefore we are required to also calculate the marginal effects, which will indicate the true strength of significant independent variables, column 1 table 12. Probit

coefficients are presented in appendix A2. The majority of the explanatory variables are dummy variables, so the marginal effects show the change in the probability of reporting positive levels of job satisfaction separation for a discrete change in the dummy from 0 to 1. The coefficients on the continuous variables, such as tenure, reflect the change in the probability for a one unit deviation from the mean of the explanatory variable.

We are focusing on the relationship between satisfaction and five voice channels: union recognition/members, newsletters, bonus schemes, team briefings and cascade meetings. Appraisals have to be dropped as they are too widely used to provide the necessary variation. The predicted probability of a positive level of satisfaction is 0.67. The marginal coefficients on cascade meetings and newsletters are small and positive, whilst that for unions is small and negative; none is significant. Surprisingly, given the weight of evidence suggesting financial involvement is important, the coefficient on bonuses is also small and insignificant. Perhaps this reflects the lack of employee control associated with schemes offering financial incentives. The only mechanism that is significantly related to satisfaction is the use of team briefings. The use of such meetings is associated with a 15 percentage point reduction in the likelihood of reporting high or fairly high levels of job satisfaction. This accords with the discrepancy between employers' views of the benefits of direct communication channels (IRS: 1993), and those of employees (Marchington et al: 1992a). Whilst team briefings offer an opportunity for direct dialogue between workers and supervisors or managers, Marchington et al (1992a) report that a sizeable proportion of employees believe such mechanisms are a means to boost efficiency not their satisfaction.

Other control variables are significantly related to satisfaction. Company dummies are most strongly related to satisfaction. All groups are more likely to report positive satisfaction than those employed by the food manufacturer, with levels highest for employees of the retail and leisure firms. Most studies of workers satisfaction employ some control for wage levels. We look at relative wages, as it seems likely that workers judge their position to that of individuals they know in the local labour market. Those earning a lot or a little more than the local average are no less satisfied than the default, but those earning a little less have a predicted probability of 0.79 of being satisfied. Region too is a significant influence. As we controlled for relative wages this is likely to capture the

influence of unemployment and the ability to find other employment. Workers in the South East and West Midlands are significantly less likely to report positive levels of satisfaction. Of the demographics two yield interesting results. Employees with degrees have a much lower probability of reporting job satisfaction. It is likely that jobs with these employers do not fulfil their expectations. In support of this, Tsang et al (1991) suggest that over-qualification was a likely cause of dissatisfaction with one's job. Whilst young workers are less likely to be satisfied, age squared is positively related to satisfaction. As workers age their mobility is reduced by family and financial commitments, which may force them to remain in a job they do not like. However, as they age their commitments reduce enabling a move, inactivity or even early retirement. Females generally have higher levels of satisfaction than men in the literature (Clark: 1997), but there is no relationship here. This may be due to the richness of the data set, allowing us to control for the presence of a partner and children.

Much information may be lost by conflating respondents' satisfaction into a dummy variable, so ordered probit analysis is also undertaken using the categorical satisfaction variable. The observed level of satisfaction is given by $n=1$ if $n^*<c_1$, $n=2$ if $c_1<n^*<c_2$, $n=3$ if $c_2<n^*<c_3$, $n=4$ if $c_3<n^*<c_4$, $n=5$ if $c_4<n^*$, where the c's are the cut-off points between which the latent variable falls. Then, the probability that a bargaining group belongs in the first category, $n=1$, can be given as:

$$\Pr (n=1) = \Pr (n^*< c_1) \qquad \qquad \textbf{Equation 2}$$
$$= \Pr (\beta x + u < c_1)$$
$$= \Pr (u < c_1 - \beta x)$$
$$= \Phi (c_1 - \beta x)$$

Φ is the cumulative normal distribution. Similarly,

$$\Pr (n = 2) = \Phi (c_2 - \beta x) - \Phi (c_1 - \beta x)$$
$$\Pr (n = 3) = \Phi (c_3 - \beta x) - \Phi (c_2 - \beta x)$$
$$\Pr (n = 4) = \Phi (c_4 - \beta x) - \Phi (c_3 - \beta x)$$
$$\Pr (n = 5) = 1 - \Phi (c_4 - \beta x)$$

The same control variables are used as in equation 1, and the coefficients in the final column of table 12 indicate which independent variables are significantly related to satisfaction, but do not measure the strength of the relationship. For ease of interpretation we employ further statistical techniques to create a 'benchmark employee'. The model is then adjusted to provide information as to the influence of the voice mechanisms on satisfaction. The first column of table 13 reports the probability of reporting different levels of job satisfaction for the default employee, John, a male worker earning around the average local wage, based in Yorkshire, with GCSE level qualifications, working for the food manufacturer. All continuous variables are set to their mean values. In the second column we perform the same exercise using a cohabiting woman, Angie, a much more common type of employee in this dataset. The probability that this benchmark respondent will report the highest level of satisfaction has now risen from 0.06 to 0.08. The probability that John will be very or quite satisfied is 0.37 percentage points, compared to 0.42 for Angie. John has a 0.11 probability of being very dissatisfied, compared to 0.08 for Angie.

The subsequent columns adjust for the presence of each form of voice mechanism in turn. The predicted probability of reporting very high satisfaction actually falls when team briefings are used at the site, to 0.05. All other voice mechanisms are associated with an improved probability of being very satisfied. The predicted probability that Angie will be very satisfied is 0.09 if newsletters are added, 0.10 if cascades or bonuses are introduced, but 0.11 if there are union members or union recognition. This indicates that some form of union presence outweighs even the positive influence of a bonus scheme. This indicates that there might be some benefit, in terms of positive levels of employee satisfaction, from collective representation or procedures.

We hypothesised that direct or individualistic voice mechanisms would have a more positive relationship with satisfaction than collective ones. The evidence from this dataset is contradictory: the ordered probit benchmark effects suggest unions are related to a greater probability of reporting very high levels of satisfaction, but this was not supported by other techniques. Both ordered probit benchmark effects and correlations suggest that bonus schemes are related to greater satisfaction, but this variable was insignificant in a probit

regression. The only significant voice mechanism in the probit analysis is team briefings, the use of which is negatively related to satisfaction. Yet this does not achieve significance in other analyses. The inconsistency of results suggests that none of the mechanisms available in this dataset contributes greatly to employee satisfaction. The original hypothesis therefore is disproved.

c) Voice And Employee Turnover

The bottom row of table 11 provides correlation coefficients for the relationship between the probability of separating and the different voice mechanisms. Both cascade meetings and the use of newsletters are very strongly positively related to the probability of separation. The relationship between separations and union recognition is less surprising. In line with the weight of evidence, union recognition and separation are very strongly significantly negatively related.

The final analysis in this chapter is a multivariate analysis of the probability of separation, where the separation variable takes the value one for those respondents who depart from the retailer or hotel chain in the 18 month period between data dumps. Again as the dependent variable is a dummy variable, the estimation will take a probit format. The equation to be estimated takes the form:

Prob (separation) = aP + bQ + cR + e   **Equation 3**

where P is a vector of personal characteristics, Q represents a vector of characteristics reflecting employment alternatives, R represents the vector of voice mechanisms, and e represents the disturbance term, which we assume to be normally distributed to justify the choice of a probit function. The marginal coefficients are presented in table 14, with probit coefficients presented in appendix A2. In this estimation we control for the same personal characteristics as in the satisfaction model, but add in some additional control variables. Whereas the union dummy for the satisfaction analysis represented recognition in some

firms and the presence of members in others, the two companies used for separation analysis were only asked about recognition. The team briefings variables has also been amended to reflect the widespread use of this channel of communication; the dummy used now indicating weekly or fortnightly meetings.

Column 1 of table 14 reports results using total separations as the dependent variable, column 2 uses voluntary turnover. Table 4 presented the sample means for the parametric testing: 23.6 per cent of employees had left their jobs between the two data dumps; 19.6 per cent had quit. Voluntary turnover, or quits, is the theoretically appropriate measure to use, and this is supported by the diagnostics. We look first at the relationship between the five variables indicating the use of voice mechanisms and voluntary separations. The predicted probability of quitting is 0.11. Union recognition and regular team briefings are positively related to quits, leading to respective probabilities of 0.17 and 0.16. This is obviously undesirable given the costs of hiring and firing, and in the case of union recognition is contrary to the body of evidence. Although the information on which voice mechanisms are used by site predates the labour turnover data, this is not conclusive proof that union recognition and team briefings lead to higher labour turnover. This is an area where it would be useful to know more about the chain of causality. In the case of team briefings, it may be that the use of regular meetings acts as a form of pressure on staff causing them to seek alternatives, or these meetings may have been introduced to help deal with a high rate of labour turnover. Bonus schemes and newsletters are associated with lower quit probabilities. In the case of bonus schemes, this is not surprising, there is a body of evidence linking financial participation to lower quits (Wilson and Peel: 1990; Wooden and Baker: 1994). Additionally, bonus schemes boost take home pay and may improve gross income as compared to other available jobs. The impact of newsletters is significantly negative, whereas cascade meetings are negatively though insignificantly related to separations.

A range of demographic and workplace variables are significantly related to quits. As with job satisfaction the relationship between age and quitting is quadratic: as employees age they are less likely to quit, a relationship which is reversed once they pass prime age. There are six educational categories, but the only group significantly related to

quits is degree holders, with a predicted probability of quitting of 0.26. Highly qualified employees such as these should enjoy greater mobility than others, and can move on if the job fails to stimulate them. The lower predicted probability of quitting for professionals and junior managers seems to contradict this hypothesis. However, the highly qualified who quit may be those in low skill jobs. Employees in the unskilled and trainee category have a higher predicted probability of quitting, but this may be picking up selection effects from trainees who recognise their unsuitability for the job. Such an interpretation accords with the negative coefficient on tenure. Two final results warrant discussion. Information on the median wage is available at the travel to work area level. The coefficient on wages relative to the local median is positive, which is counter intuitive indicating as it does that those earning more are more likely to quit. As we have controlled for skill and education level it is not clear what is driving this result. Finally, retail employees have a much lower predicted probability of quitting than hotel staff. Few significant variations emerge comparing the quits and the undifferentiated turnover model. Crucially, union recognition is insignificant in the full turnover model. This too is counterintuitive. Trade union recognition reduces the ability of employers to dismiss employees at will, so it should be negatively related to the overall separation rate. Three demographic variables have different effects: full time status; vocational qualifications; and cohabitation.

The relationship between voice and quits varies according to the method of analysis. Correlations implied that unions were negatively related, and newsletters and cascades positively related to separations, which is the reverse of regression results. The regression results for quits, both unions and team meetings are significantly positively related to voluntary separations. As quits lead to hiring and training costs, £560 and £710 (for full-time staff) for the retail and hotel firms respectively, voice institutions which may encourage quits are undesirable. Newsletters hardly constitute a meaningful channel of voice, yet whilst the use of newsletters was related to lower satisfaction scores, this communication method shows a sizeable negative relationship with separations. The one relationship which corresponds to extant theory is that between bonuses and quits. The use of bonuses is associated with a predicted quit probability of 0.06, compared to 0.11 at sample means. Voice mechanisms have inconsistent associations across satisfaction and quits too. None of the voice mechanisms in the primary data set has a consistent

relationship with satisfaction. One method of analysis showed a positive relationship between unions and satisfaction, and another suggested team briefings were the only significantly related institution, and they were negatively related. It may be that the type of employee represented in this data set is looking for something other than a meaningful career and a high level of involvement in decision making. The data set covers low paid industries, has a high proportion of young people and many women who are married with children. Trade union recognition and team briefings may imply a greater level of engagement than they have time for or are interested in.

Section 6: Conclusions

This chapter investigated the pattern of voice in British workplaces over the last twenty four years, and pursued the relationship between different forms of voice and both satisfaction and quits. The context was described using information from three Workplace Industrial Relations Surveys, whilst a unique data set representing employees in low paying firms was used to explore the issues of voice and satisfaction and quits.

The industrial relations landscape has changed significantly since the first WIRS, and the development of human resource management in the UK, with its emphasis on unitarist relations, has been accompanied by a drive for better organisational performance. These influences make it important to achieve clear communication between employers and employees and to allow employees to make contributions to the success of the organisation. We hypothesised that WIRS data would show that collective voice mechanisms had been replaced by institutions for direct communication and employee involvement. We predicted that employers in the primary data set would be using schemes which bring home to workers how their performance is tied to that of the organisation, and so would favour direct communication, and that they would be swayed by innovation and use a variety of schemes simultaneously. WIRS data showed that whilst there has been a limited fall in the use of collective fora, and a very significant rise in direct channels of communication and involvement, organisations which use collective fora tend to use direct mechanisms too. The primary data set is made of five firms in the hotel, quick service restaurant, food manufacturing, retail and leisure industries. WIRS data shows that these service industries

used fewer collective mechanisms than the average, whilst food manufacturing was more reliant on trade unions and committees than the average. All industries represented in the primary data make greater than average use of profit share and share ownership schemes. The primary data set had information on a limited number of downward communication channels: team briefings; cascades; newsletters; appraisals; and bonuses. Union recognition is the only voice mechanism which offers even a chance of power sharing, and only two firms allowed site managers to consider recognising unions locally. Channels for direct communication and involvement are more common than collective voice in the primary data set. As predicted, sites in the primary data tended to use multiple channels for communication, and financial involvement through bonuses was very common.

The satisfaction levels of employees in the primary data set were generally positive, especially for the contextual aspects of their jobs. Given their low pay levels and the relatively unskilled nature of the work, this tells us that these employees have very limited expectations. Unions are traditionally associated with lower employee satisfaction, though this may reflect the emphasis unions place on the negative aspects in workplaces in order to justify their existence. WIRS data showed a rise in direct communication mechanisms, channels which enable employers to get their message across in the manner they choose. These mechanisms might also satisfy the demand of increasingly better educated workers for more both greater information and more immediate disclosure. We hypothesised that direct or individualistic voice mechanisms would have a more positive relationship with satisfaction than collective ones. The evidence from this dataset is contradictory: no communication mechanism proved to be consistently related to satisfaction, either negatively or positively. Financial involvement, in the form of bonus schemes, is the most positively associated voice channel. In contrast to the stylised fact about unions and satisfaction, unions were not negatively related to job satisfaction; having a benign or positive association with employee contentment. Overall, the inconsistency of results suggests that none of the mechanisms available in this dataset contributes greatly to employee satisfaction.

The exit-voice model predicts that employees, faced by problems such as a deterioration in working conditions, will chose between quitting or complaining. Whilst

Hirschman (1970) believed such a choice reflected their loyalty, we hypothesise that it reflects the relative costs of using either and whether a voice mechanism or alternative job is even available. It was specifically hypothesised that as collective procedures and communication fora give greater protection to workers, and indicate a degree of real power-sharing they will be negatively related to quits. Financial schemes are also linked to lower quit rates in the literature, so it was hypothesised that they would be negatively related in this data set. Again, the results contradict previous evidence and no voice or communication channel was consistently related to labour turnover; unions again defying our expectations. Whilst confirmation of a negative relationship between bonuses and quits in regression analysis corresponds to our expectations, the positive relationship between union recognition and quits arising from regression analysis does not.

It is not immediately apparent why these results should be so different from existing evidence, though this does reinforce the need to test out stylised facts on new data sets. This chapter uses a distinctive primary data set: payroll and questionnaire data are available across 1,700 individuals and 52 workplaces. It covers five nationally established UK companies, four of whom are service sector employers. The workers are predominantly women in low paying, low skill jobs, many of women are married with children; the quick service restaurant, which has a higher proportion of male workers, uses very young employees, many of whom are still studying. The distinctive nature of the data may be crucially important. It may be that the type of employee represented in this data set is looking for something other than a meaningful career and a high level of involvement in decision making in their current position. Whilst financial schemes that reward them for their effort may be welcome, communication schemes which require them to generate ideas or to absorb company performance targets may be more than they are looking for. Quits bring costs and disruption to an organisation. The exit-voice model has been used to illustrate how the introduction of voice mechanisms can reduce quits. Evidence from this data suggests quits are generally unrelated to the type of voice options on offer, which we argue reflects the type of employees and workplaces we have examined.

Endnotes

[1] In 1985 the government passed a requirement that all large companies, those with an annual turnover of more than £2.8 million or more than 250 employees, list the measures they had taken to boost employee involvement in their annual report. Whilst this did not require that they undertake change it did encourage such moves.

[2] The correlation coefficients and significance levels for the simultaneous use of collective and individual mechanisms of voice are for 1980: -0.048 (0.072), for 1990: 0.144 (0.000), and in 1998: 0.184 (0.000). Therefore the relationship is insignificantly negative in 1980 and significantly positive in the two subsequent periods at the 1% level.

Table 1. A Comparison Of Average Workforce Characteristics In The Primary Sample With Those In The Labour Force Survey

Sector	Labour Force Survey (1997q1)	Payroll sample
Hospitality*		
Proportion female, %	61.5	56.8/66.8*
Average age	31.8 years	22.5/29.4*
Tenure	5 years	1.25/2.8*#
Food manufacturing		
Proportion female, %	34.6	17.7
Average age	38 years	30.6
Tenure	8 years	3.25
Retail		
Proportion female, %	36.8	79.5
Average age	33.5 years	24.2
Tenure	6 years	6
Leisure		
Proportion female, %	48.9	71.6
Average age	36.7 years	33
Tenure	7 years	6

This table uses information from LFS 1997, quarter 1.

*The payroll sample figures for the hospitality industry are split to display values for the quick service restaurant and hotel sector respectively.
Tenure figures for hotels only relate to staff who do not exit during the study.
No payroll data was made available by the leisure firm, so information is derived from the satisfaction questionnaire sample.

Table 2. A Comparison Of Firm And Industry Wage Means

Measure	Leisure	Hotels	Retail	Food Manufacturer	Quick Service Restaurant
Firms' mean wage, £	3.64	3.93	4.04	3.91	3.37
Industry mean using information from LFS 1997q1, £	7.94	3.99	4.64	6.95	3.99

Table 3. Worker Satisfaction With Different Aspects Of The Job, By Company

Question	Quick Service restaurant	Retail	Leisure	Food Manufacturer	Hotels
I get along well with Supervisors	1.85	1.92	1.80	2.00	1.83
I get on well with other workers	1.53	1.53	1.85	1.70	1.56
The company is a good employer	2.41	2.30	3.01	3.04	2.58
The hours suit me	2.25	2.09	1.84	2.99	2.22
Getting to work is not a problem	1.76	1.74	2.18	2.07	1.75
Promotion prospects are good	3.31	3.45	3.03	3.54	3.51
I could stay in the job forever	3.37	3.35	3.37	3.36	3.59
Tired when get home from job	2.21	2.21	2.47	2.26	2.23
I find the job challenging	2.85	2.95	2.81	2.87	2.82
Interested in this type of business	2.87	2.66	3.03	2.65	2.35
The pay is good	3.36	2.75	3.92	3.51	3.70
All in all I am satisfied with the job	2.41	2.42	2.50	2.87	2.51

Responses are based on a Likert scale, with 1 representing strong agreement with each statement and 5 strong disagreement. Therefore the lower scores represent greater levels of satisfaction.

Table 4. Sample Means Of Primary Data Set

Variable	Satisfaction analysis	Turnover analysis
Hotel chain (proportion of sample)	21.5	43.8
Food manufacturer (proportion of sample)	14.3	Not used
Quick service restaurant (proportion of sample)	14.4	Not used
Food retailer (proportion of sample)	16.6	56.2
Leisure firm (proportion of sample)	33.1	Not used
Female	61.7	73.8
Age	32.3	34.6
Age2/100	12.1	13.9
Ethnic minority	25.0	9.1
CSEs	7.9	16.1
GCSEs	34.2	31.5
A levels	8.5	8.9
Degree	8.6	4.1
Vocational qualifications	15.9	10.9
No qualifications	24.9	28.5
Married/co-hab	48.5	16.7
One kid	19.4	15.0
Two or more kids	26.6	28.5
Much more than other local wages	16.4	n/a
A little more than other local wages	14.6	n/a
Paid about the same as other local jobs	32.3	n/a
A little less than other local wages	23.2	n/a
A lot less than other local wages	13.4	n/a
Hourly wage relative to median wage of travel to work area	n/a	0.7
Yorkshire and Humberside	16.2	n/a
South East	15.5	n/a
South West	10.9	n/a
West Midlands	25.1	n/a
North West	32.3	n/a

Table 4. Sample Means Of Primary Data Set Cont.

Variable	Satisfaction analysis	Turnover analysis
Unemployment in travel to work area 1997q1	n/a	7.3
Tenure	60 months	63 months
Unskilled or trainee position	n/a	18.5
Semi-skilled position	n/a	43.8
Semi-skilled position with some responsibility	n/a	13.0
Skilled or supervisory	n/a	12.4
Junior management or professional	n/a	12.3
Full time (30 hours or more per week)	n/a	48.8
Voice mechanisms		
Union recognition or presence of members*	36.1	44.2
Newsletter	40.3	37.7
Bonus schemes	58.2	61.4
Team briefings	88.8	n/a
Very regular team briefings**	n/a	52.7
Cascade	32.1	22.7
Appraisals	92.1	100
Very or quite satisfied with the job overall	52.0	n/a
Number who separate from their position	n/a	23.6
Number who chose to separate	n/a	19.6
Sample size	909	660

The table reports the samples used for regression analysis. The total number of questionnaires returned was around 1,700. Information from all of these is used in non-regression analysis.

*The question asked of the two companies used in the separation analysis referred to union recognition not the presence of any union members.

**All branches of the two companies examined in the separation analysis used some team briefings, so the sample was split between those who used such meetings regularly (weekly or fortnightly) and those who used them less frequently.

Table 5. The Incidence Of Voice Mechanisms Over Time, Work Industrial Relations Surveys 1980/90/98

Mechanisms	1980	1990	1998
Union recognition	65.9	68.8	55.9
JCC or similar	50.7	45.3	45.5
Health and safety committee!	64.5	57.7	39.8
Team briefing	N/a	56.4	89.4
Quality circle	N/a	37.0	47.7
Surveys	N/a	23.3	54.4
Management chain	N/a	68.8	68.6
Newsletters	N/a	59.6	63.6
Suggestion schemes	N/a	37.3	28.6
Cascade meetings	N/a	46.6	38.8
Collective grievance procedures*	90.3	96.0	63.4
Individual grievance procedures	88.2	94.3	94.6
Paid by results (non-managerial staff)	96.3	84.8	N/a
Merit pay (non-managerial staff)	N/a	40.8	26.0
Share ownership/profit share schemes (non-managerial staff)	11.0	45.8	43.6
Made efforts to boost employee involvement (in last 3 years/5 years 1998)	31.7	49.6	54.1
Appraisals	N/a	30.3	83.2
Any collective voice mechanisms**	84.1	81.9	74.2
Any individual voice mechanisms***	11.0	95.1	98.2

The survey added workplaces with between 10 and 24 employees to the sample in 1998. These have been dropped for consistency, so all establishments have 25 or more employees.

N/a indicates that this question was not asked in a particular year.

* In all surveys two questions are asked: the existence of a procedure for dealing collectively with grievances relating to pay and conditions, and discipline and dismissal. Answer reflects the existence of one of these.

** Represents a hybrid of variables indicating either a collective voice forum such as a union or joint consultative committee or health and safety committee.

*** Represent a hybrid of variables indicating either forms of employee communication which are accessible to individuals or the existence of a share ownership or profit share scheme.

! in 1998 the question about the existence of health and safety committees changed significantly. Respondents were asked if they had any health and safety joint committees and then whether any that specifically dealt solely with these issues. In previous years they were asked directly about the existence of a dedicated health and safety committee.

The table shows the unweighted percentages of all establishments, in both private and public sectors, falling in to each of the voice categories.

Table 6. The Incidence Of Voice Mechanisms Over Time In The Retail And Hotel/Restaurant Sectors: Surveys 1980/90/98

Mechanisms	Retail			Hotels/restaurants		
	1980	1990	1998	1980	1990	1998
Union recognition	63.6	43.8	37.0	23.0	14.8	11.8
JCC or similar	38.6	36.9	44.7	36.1	37.7	23.6
Health and safety committee	34.1	42.5	39.8	37.7	21.3	17.3
Team briefing	n/a	71.9	92.2	n/a	55.0	89.0
Quality circle	n/a	40.0	43.2	n/a	35.0	32.3
Surveys	n/a	13.8	56.6	n/a	16.7	50.5
Management chain	n/a	68.1	72.7	n/a	56.7	51.2
Newsletters	n/a	69.4	63.7	n/a	46.7	44.9
Suggestion schemes	n/a	34.4	39.4	n/a	30.0	28.4
Cascade meetings	n/a	45.6	36.3	n/a	33.3	42.5
Collective grievance procedures*	95.5	98.1	59.0	70.5	85.3	42.4
Individual grievance procedures	93.2	96.9	95.0	65.6	85.3	88.2
Paid by results	81.8	83.75	n/a	90.2	86.9	N/a
Merit pay	N/a	40.0	34.5	N/a	34.4	17.3
Share ownership schemes	25.0	78.6	74.5	11.5	64.4	52.8
Made efforts to boost employee involvement (in last 3 years/5 years 1998)	31.8	55.6	61.8	37.7	41.0	48.0
Appraisals	N/a	71.8	92.2	N/a	48.0	83.5
Any collective voice mechanisms**	75.0	73.1	69.3	47.5	45.9	39.4
Any individual voice mechanisms***	25.0	95.8	98.1	11.5	90.6	96.9

Information in 1980 & 1990 is available at the 1968 SIC (two digit) order level, but 1998 data were only made available at the one digit level. The survey added workplaces with between 10 and 24 employees to the sample in 1998, these have been dropped for consistency so all establishments have 25 or more employees.

N/a indicates that this question was not asked in a particular year.
* In all surveys two questions are asked: the existence of a procedure for dealing collectively with grievances relating to pay and conditions, and discipline and dismissal. The answer reflects the existence of one of these.
** Represents a hybrid of variables indicating either a collective voice forum such as a union or joint consultative committee or health and safety committee.
*** Represent a hybrid of variables indicating either forms of employee communication which are accessible to individuals or the existence of a profit share/share ownership scheme.

The table shows the unweighted percentage of workplaces with each category of voice mechanism in the selected industries.

Table 7. The Incidence Of Voice Mechanisms Over Time In The Food Manufacturing And Leisure Sectors: Surveys 1980/90/98

Mechanisms	Food manufacturing			Leisure		
	1980	1990	1998	1980	1990	1998
Union recognition	84.8	80.6	55.2	39.6	80.9	48.7
JCC or similar	69.6	58.3	49.8	39.5	48.9	39.6
Health and safety committee	88.0	80.6	59.9	31.6	53.2	24.3
Team briefing	N/a	62.5	81.9	n/a	57.5	88.3
Quality circle	N/a	34.7	59.2	n/a	36.2	28.3
Surveys	N/a	23.6	50.9	n/a	12.8	40.0
Management chain	N/a	75.0	64.2	n/a	59.6	59.5
Newsletters	N/a	61.1	54.9	n/a	46.8	48.7
Suggestion schemes	N/a	22.2	18.7	n/a	36.2	22.5
Cascade meetings	N/a	45.8	29.4	n/a	42.6	45.1
Collective grievance procedures*	97.8	98.6	63.2	79.0	97.9	50.5
Individual grievance procedures	98.9	97.2	93.6	84.2	95.7	90.1
Paid by results	94.6	77.8	n/a	100	91.5	N/a
Merit pay	N/a	50.0	25.8	N/a	19.2	18.9
Share ownership schemes	28.3	68.6	61.2	0	55.0	30.6
Made efforts to boost employee involvement (in last 3 years)	39.6	43.1	57.5	23.7	42.6	45.1
Appraisals	N/a	26.9	74.9	N/a	29.7	73.9
Any collective voice mechanisms**	95.7	87.5	80.3	73.7	97.9	65.8
Any individual voice mechanisms***	28.3	95.8	97.7	0	100	97.3

Information in 1980 & 1990 is available at the 1968 SIC (two digit) order level, but currently only at the one digit level for 1998 data. The survey added workplaces with between 10 and 24 employees to the sample in 1998, these have been dropped for consistency, so all establishments have 25 or more employees.

N/a indicates that this question was not asked in a particular year.

* In all surveys two questions are asked: the existence of a procedure for dealing collectively with grievances relating to pay and conditions, and discipline and dismissal. Answer reflects the existence of one of these.

** Represents a hybrid of variables indicating either a collective voice forum such as a union, joint consultative committee or health and safety committee.

*** Represent a hybrid of variables indicating either forms of employee communication which are accessible to individuals or the existence of a profit share or share ownership scheme.

The table shows the unweighted percentage of workplaces with each category of voice mechanism in the selected industries.

Table 8. Incidence Of Voice Measures By Site

Firm	Number of sites	News letter	Bonus Scheme	Team briefing	Appraisal	Cascade meeting	Union members here	Union recog'n
Hotels	7	4 (57)	6 (86)	7 (100)	7 (100)	3 (43)	–	1 (14)
Retail	5	1 (20)	1 (20)	5 (100)	5 (100)	0 (0)	–	4 (80)
Leisure	11	2 (27)	8 (75)	11 (100)	11 (100)	1 (9)	4 (36)	–
Quick Service Restaurant	26	5 (18)	21 (81)	9 (35)	26 (100)	24 (92)	0	–
Food Manu-facturer	3	2 (67)	0 (0)	2 (67)	2 (67)	2 (67)	2 (67)	–

Cells contain the actual number of sites using particular voice mechanisms, the percentage of sites with each mechanism is given in parentheses

Table 9. Mean Value Of Overall Job Satisfaction, By The Presence Of Voice Mechanisms

Mechanism	Yes	No	T-test value
Union recognition	2.42	2.50	1.00
Union members	2.45	2.40	-.41
Team briefings	2.42	2.54	1.45
Cascade meetings	2.53	2.38	-2.47**
Bonus	2.38	2.54	2.65***
Appraisals	n/a	n/a	n/a
Newsletter	2.52	2.40	-1.77*

* indicates a significant correlation at the 10% confidence level, ** at the 5% level, and *** at the 1% level. The second food manufacturing site was the only plant not to employ appraisals, and as employees did not complete satisfaction questionnaires then we cannot say anything about the interaction of this voice mechanism with overall job satisfaction.

Recall that lower values imply higher satisfaction. Therefore we can conclude that use of newsletters and meetings of all staff are associated with lower satisfaction than when not used. However, the use of a bonus system is related to a higher level of overall satisfaction.

Table 10. Cell Proportions For Strength Of Agreement With The Statement 'All In All I Am Satisfied With The Job' By Voice Mechanism

Mechanism present	Union recognition		Union members		Team briefings		Cascade meetings		Bonus		Appraisals*	Newsletter	
Strength of response	Y	N	Y	N	Y	N	Y	N	Y	N	Y	Y	N
Strong agreement	22.3	16.2	28.8	12.4	17.0	18.4	15.3	18.2	18.4	15.0	17.2	20.5	16.9
Weak agreement	32.2	36.3	18.2	39.7	34.9	34.7	41.4	31.4	37.5	30.3	34.9	26.9	41.3
Neutral	30.8	33.3	35.4	32.5	33.2	29.0	28.9	34.8	32.6	33.0	32.7	40.5	30.5
Weak disagreement	10.6	8.9	15.2	12.7	12.0	10.0	9.3	13.1	8.5	17.3	11.8	7.0	9.6
Strong disagreement	4.1	5.2	2.5	2.7	2.9	7.9	5.3	2.6	3.0	4.4	3.5	5.1	2.7
Column totals**	100	100	100	100	100	100	100	100	100	100	100	100	100
Total no. of obs	292	369	198	733	1402	190	551	1041	1007	585	1592	528	989

* All subject to appraisals except for the second food manufacturing site, on which there is no information. ** column totals may be slightly out due to rounding of percentages. Hotel and retail managers were asked about recognition, other managers about the presence of union members.

Table 11. Correlation Coefficients Between Voice Mechanisms And Satisfaction And Separation Probabilities Of Workers

Level of satisfaction	Newsletter	Bonus Scheme	Team briefings	Appraisals!	Cascade meetings	Union members here	Union recognition
Very or quite satisfied with job#	-0.093*** (0.000)	0.102*** (0.000)	-0.009 (0.736)	0	0.067*** (0.007)	-0.042 (0.199)	0.019 (0.632)
Separations#	10.139*** (0.000)	-0.035 (0.210)	-0.013 (0.648)	0	1.123*** (0.000)	–	-0.432*** (0.000)

!all who register as very or quite satisfied with the job are subject to appraisal so this variable is dropped. #satisfaction analysis uses all five companies, whereas separation analysis just uses data on retail and hotels.
* indicates a significant correlation at the 10% confidence level, ** at the 5% level, and *** at the 1% level.

Table 12. Marginal Coefficients From Probit Estimates On Job Satisfaction

Variable	Marginal effects	Ordered probit
Union recognition or presence of members	-0.073 (0.082)	-0.164 (0.192)
Newsletter	0.002 (0.041)	-0.089 (0.121)
Bonus schemes	0.019 (0.063)	-0.121 (0.160)
Team briefings	-0.148** (0.053)	0.284** (0.134)
Cascade	0.058 (0.069)	-0.112 (0.134)
Hotel chain	0.190* (0.093)	-0.314 (0.326)
Quick service restaurant	0.163* (0.088)	-0.567* (0.292)
Food retailer	0.371*** (0.066)	-0.813*** (0.242)
Leisure firm	0.393*** (0.062)	-0.756** (0.300)
Female	-0.007 (0.037)	-0.106 (0.082)
Age	-0.027* (0.015)	0.077*** (0.027)
Age^2	0.036** (0.018)	-0.109*** (0.033)
Ethnic minority	0.042 (0.066)	0.054 (0.148)
Married/co-hab	0.008 (0.039)	-0.043 (0.075)
One child	0.068 (0.049)	-0.266** (0.105)
Two or more children	0.064 (0.057)	-0.158 (0.123)
CSEs	0.022 (0.097)	-0.351 (0.229)
A levels	-0.063 (0.057)	0.102 (0.141)
Degree	-0.167* (0.093)	0.338* (0.186)
Vocational qualifications	0.055 (0.055)	-0.284*** (0.095)
No qualifications	-0.070 (0.051)	-0.048 (0.117)
Much more than other local wages	-0.105 (0.092)	0.478*** (0.169)
A little more than other local wages	-0.114** (0.053)	0.468*** (0.136)
A little less than other local wages	0.125** (0.056)	-0.186 (0.143)
A lot less than other local wages	-0.016 (0.060)	-0.110 (0.142)

Table 12. Marginal Coefficients From Probit Estimates On Job Satisfaction, cont.

Voice mechanisms	Marginal effects	Ordered probit
West Midlands	-0.125** (0.058)	0.094 (0.130)
North West	-0.021 (0.083)	-0.142 (0.162)
South East	-0.289*** (0.067)	0.352** (0.158)
South West	0.020 (0.081)	-0.471*** (0.171)
Tenure	0.014×10^{-2} $(0.048) \times 10^{-2}$	0.016×10^{-2} $(0.108) \times 10^{-2}$
Sample size	909	909
Log likelihood	-516.420	-1151.432
Pseudo R^2	13.60%	6.92%
Predicted probability (at means)	0.665	N/a

The default categories are the food manufacturer, GCSE qualifications, Yorkshire and Humberside, paying about the same as other local jobs. The variable appraisal is dropped due to lack of variation across the sample. +/- indicates the sign of the estimated coefficient. Statistically significant results are reported at the 1% ***, 5% ** and 10% * significance levels.

The first column presents marginal effects from a probit regression using a dummy indicating positive levels of satisfaction, clustered by site. The second column presents coefficients from an ordered probit regression on a five point satisfaction variable.

Table 13. The Marginal Effects Of An Ordered Probit Regression On Employee Satisfaction, Using A Benchmark Employee

Level of agreement with statement 'all in all I am satisfied with this job'	Default individual* (John)	Representative individual (Angie)	Representative individual with some form of collective voice	Representative individual cascade meetings	Representative individual with team briefings	Representative individual with a bonus system	Representative individual with newsletters
Strongly agree	6.0	8.0	10.7	9.8	4.5	9.9	9.4
Agree somewhat	30.6	34.4	38.2	37.0	27.1	37.2	36.5
Indifference	37.6	36.4	34.4	35.1	38.0	35.0	35.4
Disagree somewhat	15.1	13.0	10.8	11.5	10.7	11.4	11.8
Disagree strongly	10.7	8.2	6.0	6.6	13.4	6.5	6.9

*The default individual, referred to in column 1, has the characteristics which form the default categories in the ordered probit estimation: they earn around the average local wage, are based in Yorkshire & Humberside, are educated to O level standard and work for the Food Manufacturer. They are attributed the mean age, value of age squared and length of tenure for the sample.

Column 2 adjusts the initial specification to make the benchmark individual more representative. The individual is now a cohabiting female.

Columns 3-7 add in each of the voice mechanisms in turn.

Table 14. Marginal Coefficients From Probit Estimates On Job Separations

	All turnover	Voluntary turnover
Variable	Marginal effects	Marginal effects
Union recognition	0.033 (0.098)	0.095*** (0.024)
Newsletter	-0.064** (0.028)	-0.044* (0.026)
Bonus schemes	-0.108** (0.050)	-0.062* (0.040)
Regular team briefings	0.061*** (0.016)	0.049*** (0.015)
Cascade	-0.020 (0.022)	-0.008 (0.014)
Food retailer	-0.268*** (0.092)	-0.264*** (0.046)
Female	0.059 (0.034)	0.049* (0.024)
Age	-0.047*** (0.010)	-0.026*** (0.009)
Age squared (/100)	0.054*** (0.012)	0.027** (0.011)
Ethnic minority	-0.020 (0.066)	-0.006 (0.059)
Cohabiting	-0.064* (0.030)	-0.039 (0.026)
One child	0.063 (0.063)	0.012 (0.045)
More than one child	0.072 (0.075)	0.030 (0.057)
No qualifications	-0.024 (0.049)	0.003 (0.041)
CSEs	0.049 (0.076)	0.068 (0.060)
A levels	0.033 (0.079)	0.042 (0.058)
Degree	0.169*** (0.067)	0.150*** (0.062)
Vocational qualifications	-0.093** (0.037)	-0.047 (0.039)
Relative wage rate	0.440*** (0.088)	0.444*** (0.102)
Unemployment in travel to work area 1997q1	-0.009 (0.012)	-0.001 (0.008)
Tenure	$-0.018{***} \times 10^{-1}$ $(0.006) \times 10^{-1}$	$-0.017{***} \times 10^{-1}$ $(0.005) \times 10^{-1}$
Unskilled or trainee position	0.131* (0.085)	0.117* (0.072)
Semi-skilled position with some responsibility	0.001 (0.056)	-0.003 (0.033)
Skilled or supervisory	-0.032 (0.052)	-0.036 (0.040)
Junior management or professional	-0.137** (0.044)	-0.110** (0.035)
Full time (30 or more hours per week)	0.136** (0.064)	0.039 (0.065)

Table 14. Marginal Coefficients From Probit Estimates On Separations, cont.

Number of obs	660	660
Log likelihood	-273.704	-241.580
Pseudo R^2	24.17%	25.91%
Predicted probability (at means)	0.160	0.108

The default categories are the hotel chain, GCSEs, semi-skilled occupations.

The variable appraisal is dropped due to lack of variation across the sample.

+/- indicates the sign of the estimated coefficient. Statistically significant results are reported at the 1% ***, 5% ** and 10% * significance levels.

Chapter 3. Absenteeism

1. Introduction

Absenteeism is a major workplace issue for the UK. Time off during the working week imposes costs on the employing organisation, individuals, and economy as a whole. In 2001 an average of 7.1 days were lost per employee, varying from 8.8 days for manual workers to 5.5 for non-manuals (CBI Issues Statement 2002). CBI estimates of the costs to the whole economy in sick pay and replacement staff were £11.8 billion in 2001, or £476 per employee (CBI Issues Statement 2002), rising from £10.5 billion, or £438 per worker in 1999 (CBI News Release 2000). CBI data are derived from annual surveys of organisations employing around 6 per cent of the UK's workforce, and show that larger firms and the public sector were worst affected. Historically the trend has fluctuated. Rose (1985) found increased absenteeism during the 1960s and 1970s, which was attributed to a declining work ethic. At this point the trend levelled off, before beginning to fall during the 1990s.

Absence is a labour supply issue, and so much of the economics literature on absenteeism incorporates a hedonic model, see for example Allen (1981a, 1981b, 1983) or Vistnes (1997). This model argues that it is possible to construct for each worker a series of indifference curves representing preferences across wages and absenteeism policy. Those with a high leisure preference will prefer workplaces which accommodate absence. Organisations will also develop a wage profile reflecting the ease with which they can accommodate absenteeism, which is related to the ease of capital and alternative labour substitutability. The equilibrium is reached at the tangency of the individual's indifference and the organisation's isoprofit function. The assumptions behind the model, particularly the idea that all workers have perfect mobility and can move to an organisation offering their preferred trade off of wage and absence tolerance, are unrealistic.

In the absence of a hedonic equilibrium, the costs are sizeable. The employer faces both direct and indirect costs. The direct costs derive from the lost production of the absent worker, disruption problems due to organising cover, the costs of monitoring and sometimes counselling absentees, and sick pay where the level offered exceeds the

statutory minimum. Indirectly, the work patterns and productivity of attending staff may be disrupted, specifically where team work is important. Employees too face indirect and direct costs. Direct costs are obviously any lost wages and benefits, whilst indirect costs may be the decrease in the likelihood that they are promoted, or the greater likelihood that they will be laid off in bad economic times or sacked for unreliability. Absence may, of course, have some positive aspects. Absenteeism may be good as it allows for recovery from illness, preventing the spread of infection amongst other staff. It may also act as a safety valve for stressed or dissatisfied staff – preventing the need for more permanent exit. Steers and Rhodes (1978) argue that absence theoretically lowers accidents and enables higher quality output. Indirectly it may lead to greater satisfaction amongst those attending work. The need to anticipate absences may enable co-workers to be trained in a variety of tasks so that they are able to offer cover, or they may be offered over-time working to cover the uncompleted tasks.

Absenteeism is of interest as it represents a point on the voice-exit continuum open to disgruntled workers. Hirschman (1970) identified two opposing reactions which were open to consumers faced with a decline in service or the quality of a product. These consumers could choose to exercise voice in the hope that the service or the quality of the product would be restored. Alternatively they could exit and find a substitute. Hirschman argued that the decision would reflect loyalty, with loyal consumers trying the voice option first. However, when applying this model to the labour market it is possible to assume that loyalty as a qualification might be superseded by access to a voice mechanism. So employees with limited formal voice options might exercise their voice through absenteeism. Employee exit might also be limited to absenteeism if labour market conditions were particularly difficult, or the employees faced difficulties in finding comparable alternative jobs due to their low levels of skill and constrained geographical mobility.

The aim of this chapter is to fully explore the longitudinal picture of absenteeism in one food manufacturing plant in North London in the mid 1990s. A particularly rich data set is available for this plant, comprising two and a half years' payroll data and personnel details which record absence information. This plant was typified by low tenure, high absenteeism and poor economic performance until it was taken over by a national food manufacturer in 1992. The new owners subsequently

sought to improve every aspect of performance, and following a strengthening of their position in the product market, the company introduced a significant sequence of changes in working conditions and pay from April 1995. In addition, satisfaction surveys for a small sub-set of the relevant workers were distributed in Autumn 1996; these are mapped in to payroll data. This paper will investigate whether absenteeism can be construed as a form of voice or a form of (partial) exit.

Table 1 presents industry level absence information from the 1990 Workplace Industrial Relations Survey (WIRS), and its follow up Workplace Employee Relations Survey of 1998. Respondents are asked for the percentage of staff taking time off sick over the last twelve months. Comparing the first two rows, manufacturing and non-manufacturing, the percentage of staff absent appears to have fallen between the surveys, continuing the downward trend identified by Rose (1985). There is wide variation across industries and within the same industry. Looking first at manufacturing, between 4 and 6 per cent of staff were off in the year prior to the 1990 survey, falling to 2-4 per cent in the 1998 survey, Aggregating up across all other industries, the modal categories were more than 4-6 per cent in 1990 and 2-4 per cent of staff in 1998. Comparison across the 12 main industrial classes shows that utilities and construction have particularly low rates of absence, whilst it appears highest for health and social work.

At the factory chosen for this case study, hereafter 2Bun Factory", 53 per cent of staff took time off between July 1995 and June 1996. The WIRS survey data does not give absolute levels of absenteeism, just banded values, which prevents us from observing the maximum level of absenteeism. However, even these comparisons suggest that Bun Factory has extremely high levels of absenteeism. According to the hedonic model of absence, the match between employers and employees with wage-absence preferences has been made, with Bun Factory representing a plant at the low wage-high tolerance of absence end of the continuum. Whilst this might imply that the findings of this case study are not widely transferable, the longitudinal analysis of the change in absenteeism in light of changes to pay and conditions may have more general applicability. Such a data set also affords the chance to examine whether absence is being used as voice, to draw attention to poor pay and conditions, or as exit by these employees.

The lay out of the paper is as follows: firstly, we discuss the methodological problems inherent in previous studies of absenteeism, and outline the various definitions which will be employed here. The literature review is divided in to a number of sub-sections. Firstly, the impact of demographics, and job characteristics on patterns of absenteeism is analysed. The use of lagged absenteeism is then discussed, along with an examination of the impact of internal organisational pressures and external labour market factors on absenteeism. Information is available on the job satisfaction levels of a small subset of workers, so next the paper discusses the relationship between satisfaction and absenteeism. This organisation instituted a number of improvements to working conditions and pay over the period under study. If absenteeism is used to express dissatisfaction, as an informal voice channel, improvements to pay and conditions would be likely to lower the rate on non-attendance. The effect of these workplace changes on time off is explored, with a focus on variation by skill group. Finally, some of the literature on absenteeism posits that absenteeism represents a (weak) manifestation of exit. The final sub-section examines whether the determinants of absenteeism are the same as those which lead workers to quit. The data and modelling techniques are discussed in sections 4 and 5. Results are discussed in the 6th section, with conclusions offered in section 7.

2. What Is Meant By "Absenteeism"?

Studies of absenteeism are less numerous than those of other employment phenomena such as job satisfaction or labour turnover, and those that do exist are fraught by definitional issues which make many of the results incomparable (Hackett: 1989). The practitioner literature offers a series of precise and conceptually clear definitions (ACAS: 1996, IDS: 1998).

The commonest measures are the overall rate of absence – the total number of days lost due divided by the total number of working days available; the frequency – spells of absence divided through by total employees, and the incidence – employees off one or more times divided through by total employees. These measures can be taken over different time periods - monthly, quarterly or annually and are generally multiplied out so that they can be expressed as percentages. More subtle than this,

reflecting the greater disruption caused by multiple short spells off work is the disruption index (IDS:1998). This figure is a multiple of squared spells off in a given year times days lost.

Eg: 1 spell of 14 days = 1^2 x 1 x 14 = 14

or 14 spells of 1 days = 14^2 x 14 x 1 = 2744

Source: IDS March 1998, page 4.

Academics employ different definitions and further criteria. In their attempt to define a coherent conceptual framework for this subject, Mowday, Porter and Steers (1982) identified four measures: medical absences – three days plus or spells coved by a medical certificate; frequency – number of spells; attitudinal absence – one day spells; and severity or rate – total days. They argue that each is a distinct measure, as there is little statistical correlation between the different measures.

The concern with the length of each spell, and the desire to treat differently spells of a certain length, relates to the recognition that the motivation to take time off will vary. A common argument is that absence can be broken down in to "voluntary" and "involuntary" time off. Vistnes (1997) took the position that involuntary absence would be determined predominantly by state of health, which is often not visible. Whilst the submission of a medical certificate indicates that a spell of absence was involuntary, often this degree of information is not available. Researchers need to find a way of distinguishing between the two types of absence, and longer spells are likely to indicate health problems, an involuntary cause of absence. In choosing their definition of voluntary absences, Deery et al (1999) selected periods of one or two days where the worker did not obtain a medical certificate. Mowday et al (1982) used a three day cut-off to distinguish between voluntary and involuntary absences. In a theoretical discussion of absenteeism, Steers and Rhodes (1978) argue employee absence will depend upon both the motivation and ability to come to work, reflecting a greater range of pressures than purely medical. Motivation, they argue, reflects satisfaction (voluntary absence) and family constraints and pressures reflecting the state of the wider job market (involuntary absence). Whilst Fichman (1984) argued that absenteeism theory was poorly defined, he rejected the idea that job satisfaction need be linked to

absenteeism. He felt that voluntary absence might be seen as a rational choice, part of an adjustment to changes in the psychological contract (wage-effort), or it might reflect habit. Within the data set used here it is possible to distinguish between absences covered by a medical note and those that were either self or uncertified. The latter two categories will be treated as voluntary absence.

Mowday et al (1982, p.80) offer a further refinement of the concept of voluntary absenteeism. "Attitudinal absence" refers to absences of just one day, which represents quite clear voluntary absence and may indicate a lack of commitment to the organisation. Alternatively it may offer an immediate alternative to permanent exit following dissatisfaction. This concept corresponds to the concept of the "disruption index" (IDS: 1998), as many shorter spells will generate more problems than a smaller number of long absences. This paper looks at attitudinal absences, as a subset of all voluntary time off.

The lack of consistency in defining absenteeism extends to the choice of measure to be used. Some studies choose to look at the number of days off in a given period - severity, whilst others choose the number of separate spells - frequency. In their case study, Edwards and Whitston (1993) examined spells, days lost and the duration of spells. Chaudhury and Ng (1992) estimated absence using both total days off (voluntary time off) and long spells (involuntary) which they classified as those of more than five days' duration. Hackett (1989) takes precisely the opposite approach, and finds that frequency is better explained than duration. Mowday et al (1982) also found absence frequency the most robust measure, by virtue of results in test-retest situations. Whilst there is no consensus on whether it is better to use total days or total spells, the measure chosen has implications for the modelling technique, as will be pursued in the methodology section. This study will attempt to identify which offers the more robust results: spells or total days.

The length of period under examination also varies widely. As Mowday et al (1982) point out, absenteeism will be influenced by seasonal and cyclical pressures, so the longer the period under study the more robust the results are likely to be. Studies such as that of Barmby and Treble (1991), take a short period of two weeks' information, reflecting constraints in access to data. This may go some way to explain

their inability to find significant influences. Both Edwards and Whitston (1993) and Chaudhury and Ng (1992) explore data for a one year period. Obviously access to a year's data offers the chance to look for seasonal influences. In this data set we have a period of two and a half years and choose to focus on July 1995 - June 1996, with reference to information on the previous year to construct lags.

The source of the information can also influence the quality of the data. Barmby and Treble (1991) use self-reported absence data. Where the respondent seeks to make a good impression this may be subject to attribution bias – with the individual seeking to justify their absence from work in ways different to the actual causes. The longer the period between the time off and the collection period the more likely the individual is to suffer from recall bias. As a consequence the results of Barmby and Treble are inconclusive. To avoid these problems Hackett et al (1989) asked their respondents to complete a daily sheet recording their intentions about attendance and their actual attendance during their study. The use of employers' data in this study obviously solves the recall issue, but is still open to some problems with regard to the recording of the justification for the absence. There may be some causes which the employee cannot disclose as they may prove unacceptable to the employer. In this study we have access to the employer's attendance records, which record whether the absence was uncertified, self-certified or medically certified.

The data set used in this paper is particularly rich, and enables us to surmount most of the problems encountered in previous research. Following a detailed description of the data available in section 4, we will use a one year unbalanced panel to explore the pattern of voluntary absence, using information on the probability of absence, total spells and total days off and "attitudinal" absences.

3. Themes and Hypotheses

a) Absenteeism And Demographic, Job Or Workgroup Characteristics

Much of the previous work on absence has examined the impact of individual or work group characteristics on the probability of taking time off. Gender, education level and age are often shown to be related to the probability of taking time off (Steers and Rhodes: 1978). Workplace and job characteristics may also play a role. Flexibility in selecting hours, total hours worked, and position in the hierarchy may be linked to

taking sick leave. Wage rates are influential too. The hedonic model is often used by researchers taking an economic approach to the issue of absenteeism, for example Allen: 1981, Vistnes: 1997. According to this model, across the labour market workers seek out firms offering their desired bundle of wages and absenteeism tolerance. This may not be a reasonable assumption for workers whose skills are so limited that they have few job choices, or those who are geographically immobile. Within our sample such a trade off and pairing of firms with particular isoprofit functions and workers with tangential indifference curves would already have been made. Therefore it is possible to concentrate on an analysis of the demographic and job characteristics which may affect absenteeism.

Female labour market participation rates are lower than those of men, and their choice of employment is often driven by the need to combine work and care for children. Most studies examining the impact of gender have found that women are more likely to take time off sick, though this may be driven by a number of factors: their lower labour market commitment (Mastekaasen & Olsen: 1998, Chaudhury & Ng: 1992); their need to care for other family members (Allen: 1983); or poorer health (Vistnes: 1997). Vistnes (1997) argues that the pattern of absenteeism varies so much by gender that separate equations should be run. In her study of involuntary absence in the US during the 1980s, the coefficients on a number of variables were significantly different by sex. Women were significantly more likely to be off and to take longer to recover than men. The results were driven by poorer health and the need to care for their young children. Men with young children in child care conformed more to the absence pattern of mothers of young children than the standard pattern for men. Mastekaasen and Olsen (1998) find similar results in their study of gender differences in the Norwegian public sector, though they cited a slightly narrower motivation. They used panel data to control for occupational and workplace crowding. Women were more likely to be off and to obtain medical certificates, though differences disappeared when looking at longer spells off work. They claim that this reflects the importance women attach to childcare. Edwards and Whitston (1993) found that women of child bearing age were more likely to take time off in the pharmaceutical factory they studied, which led the employer to advocate avoiding their employment. Whilst most studies concentrate on gender differences, and find that women's absenteeism is higher than

men's, Delgado and Kniesner (1997) look at marital status. They find that married men take more time off than single.

In a series of papers looking at absenteeism in industrial contexts Allen (1981a, 1981b, 1983) employed the hedonic model. Whilst this model suggests that an equilibrium can be reached, with those workers who prefer high absence and low wages matching themselves to organisations offering a low wage-high tolerance of absence, he finds several factors which are associated with higher absenteeism. Absence is linked to inflexibility in scheduling and accident rates. Access to flexibility with regard to work scheduling is often argued to inhibit absence, as workers are better able to deal with other commitments (Allen: 1983). In his earlier study of the US paper industry, Allen (1981) found that workers in large plants were more likely to take time off as they were more constrained by predetermined work schedules, suggesting that size is related to inflexibility. Chaudhury and Ng (1992) investigated modelling techniques for predicting absenteeism using Canadian industry data. Whilst they too predicted that long hours would be correlated with absence, their results show that it is inflexibility in scheduling which is positively associated with time off.

Education and skill are likely to be highly correlated and will indicate the individual's position in the organisation's hierarchy. Chaudhury and Ng (1992) suggest that those with higher levels of education will face fewer hazards and have greater scope for using their initiative, leading to lower absenteeism. In practice they find that lower rates were only observed for long-term absences, which are presumably health related. Allen (1983) compares the rates of blue- and white-collar industrial workers. Blue-collar workers take more time off, but he cautions that this may reflect the greater flexibility that white-collar workers enjoy and the scope that they have for concealing their attendance behaviour. Indeed, Delgado and Kniesner (1997) found that more highly skilled labour has a higher absence rate. However, as Delgado and Kniesner point out, grade will also be correlated with hourly wage. If higher wages cause employees to take more time off then the income effect is said to dominate. The cost of leisure is the wage foregone, so where they view the cost of an hour's leisure as too expensive the substitution effect is dominant. Therefore the grade variable can be used to explore whether the income or substitution effect dominates in this sample.

Steers and Rhodes (1978) and Mowday et al (1982) both emphasise that attendance at work is driven by desire to attend and ability to attend. Distance from home to work can be classed as a factor affecting ability to attend. Those living further away will have to spend more time and may encounter more trouble reaching their destination than those living close to the plant. Delgado and Kniesner (1997) test this empirically using a sample of London transport workers, and find that distance has a significant, negative impact on attendance.

Age effects on absenteeism are indeterminate. Chaudhury and Ng (1992) argue that older workers are more likely to be ill, and hence need time off, but have stronger commitment due to financial constraints. These effects appeared to cancel each other out, and no empirical effect was measured. However, Allen (1983), using US industry level data, found that young workers were more likely to be off than their older colleagues. The London bus driver sample showed age to be negatively associated with absenteeism (Delgado and Kniesner: 1997).

As unions represent a form of voice mechanism they may have an impact on absenteeism (Allen:1984). Unionisation may lead to an increase in absenteeism as personnel policies prevent arbitrary sackings, or, it may fall if the union can solve minor problems. For instance they may reduce the need to work unpleasant or inconvenient shifts, or provide a premium for working shifts which compensates for this. Allen finds that absence in unionised plants is 34-40 per cent higher than for non-union labour. However, he suggests that it may be strength of the union rather than unionism per se which matters. The presence of a union may lead to higher expectations which only a strong union can deliver on. Addison and Belfield (2001) cover the relationship between absence and both union and non-union forms of voice. Whilst collective, representative forms of voice are positively linked with absence in 1998 WERS data, employee involvement (EI) was negatively correlated with time off. When employee involvement was disaggregated into constituent policies, such as team briefings or suggestion schemes the relationship disappeared, suggesting that EI is more than the sum of its parts.

Hypotheses for sub-section a: Demographic, Job Or Workgroup Characteristics

Many demographic and workplace features have been shown in previous work to have indeterminate effects. However, there are some hypotheses which can be made with confidence. It is to be anticipated that women will show a higher rate of absenteeism than men, and those with further to travel will be off more often than those living close to the plant. In this sample grade represents skill level, and is acting as a proxy for education and wages – as wages are non-contingent. In line with most studies it is anticipated that the less educated and less skilled will take more time off work. Whilst hours data is not available, shift pattern is. Those on day shifts are less likely to have flexibility to conduct their non-work affairs. Those on nights will face similar problems and will have to adjust their social and personal lives to fit their work schedules. Therefore it is anticipated that these groups will take more time off. When restricting the sample to voluntary absences it is likely that younger workers will take more time off. This plant remained non-union until 1999, and only introduced a formal communication mechanism, team briefings, in November 1995. Whilst it is not possible to test union impact, it is possible that the introduction of team briefings may lower absence.

b) Absenteeism And Lagged Absenteeism, External And Internal Pressures

Both Delgado and Kniesner (1997) and Avery and Holtz (1984) argue that absenteeism is a dynamic process, so models must accommodate the individual's reaction to changing circumstances. Delgado and Kniesner use data from London Transport to test a dynamic model of voluntary absence – proxied as spells of less than eight days off work. They find that independent variables affect results more than the modelling technique, and find a range of significant demographics. Lagged absence spells, from last year and the one prior to that, were significant (positive) explanatory variables at the 1 per cent level, with time off last year having the greater effect.

Steers and Rhodes (1978) mention the role of "pressures" in determining attendance. Unemployment, reflecting the ability to get an alternative job, was a significant pressure. Markham (1985), and Markham and McKee (1991), pursue this issue in much greater detail. Markham (1985) finds an inverse relationship between national unemployment and national absenteeism, a pattern which was replicated at a

local level. Markham and McKee (1991) use a data from a sample of US textile plants between January 1978 and July 1983 to look at causes in deviations from the average plant level of absenteeism. They sought to investigate the effect of external and internal pressures, namely changes in unemployment rates and changes in the size of the workforce, on attendance behaviour. They tested a range of values for external and internal pressures, to determine whether behaviour is moderated by contemporaneous plant size and unemployment rates, lagged or anticipatory rates. Both internal and external pressures cause employees to restrict their absenteeism. Contemporaneous changes in the levels of plant employment and anticipatory changes to local unemployment, of one month, and their interaction term, have the most significant impact on absenteeism, indicating a degree of economic awareness on the part of the employees. The major drawback of this study is the unrepresentative nature of the sample. Only plants which declined monotonically in size were included. It may be the case that workers in such environments are much more sensitive to these types of pressures than workers in general.

Hypotheses for sub-section b: Absenteeism And Lagged Absenteeism, External And Internal Pressures

Lower employment within the plant may lead to insecurity, so workers will tend to reduce time off to avoid early redundancy. Lower employment across their local labour market will reduce opportunities making their current job more attractive and hence lowering absenteeism. Lagged absenteeism is likely to be positively correlated with current absenteeism – both because of attitudinal reasons and as an indicator of poor health. This paper will not focus on the impact of poor health on attendance, therefore the empirical work will focus on the effect of lagged voluntary time off on current voluntary absenteeism.

c) Absenteeism And Job Satisfaction

Hirschman (1970) argues that when faced with an unsatisfactory environment an individual may react in one of two ways: they may use their voice in an attempt to improve their situation; or they may choose to exit from this position. Using this approach, employee absenteeism can be interpreted in one of two ways. Absence may be used by a dissatisfied employee as a (moderated) form of exit. Alternatively, in the absence of any institutionalised voice mechanisms such as trade unions or works

councils, or where these are perceived as having little power and independence, absence may be operating as a muted form of voice. By breaking their side of the wage-effort bargain, absent workers may signal to the employer that they are unhappy with their terms of employment and/or working conditions (Allen: 1984). Therefore, a negative relationship between satisfaction and time off may offer support for either the absence as exit or absence as voice hypothesis.

Most of the literature examining the relationship between job satisfaction and absenteeism predicts a negative relationship, see for example Chaudhury and Ng (1992). However, Steers and Rhodes' (1978) summary of extant empirical work found little evidence of a link between satisfaction and absence, and the relationship deteriorated further when individual level data were used. They hypothesised that attendance at work will reflect motivation and the ability to get to work, with motivation closely related to job satisfaction. They called for a more sophisticated model that disaggregated job satisfaction in to facets which reflect the content of the job and those which represent the work context. In their review variables related to job content, such as the degree of challenge in the job, appear to affect absenteeism more than those related to the context, such as workgroup size and relations with supervisors; with the reverse true for the relationship between facets of satisfaction and labour turnover.

The Steers and Rhodes model has been extensively used in the study of absenteeism. Mowday, Porter and Steers (1982) discuss four studies which attempted to test the model devised by Steers and Rhodes with varying results. The first of these, Hammer et al (1980), finds that satisfaction and other attitudinal factors were more closely correlated with absenteeism than demographic and job characteristics. However, the results of this study are dubious as job satisfaction and absence were positively correlated. Terborg et al (1981) found no link between ability to attend work and absence, but job satisfaction and commitment were related (inversely) to absenteeism. Frechette (1981) argues that pressure to attend was the significant factor in explaining absence, but identified commitment as a pressure to attend. In contrast, Watson's (1981) limited test found no significant factors. A later literature review, by Rosse and Miller (1984), also examined the robustness of the Steers and Rhodes model. Their summary of extant literature found that overall job satisfaction was generally negatively

associated with absenteeism, with a significant relationship between work content and absenteeism. Relations between supervisors or co-workers and absenteeism do not have significance, whilst satisfaction with pay or promotion is linked to labour turnover but not absence.

Price (1998) uses employee data for a large private hospital in the mid-western US to explore the causes of absence. Adapting the Steers and Rhodes model, Price divides influences into those which are exogenous, such as alternative jobs, repetition in the job, kinship responsibilities and social support, and those which are endogenous, such as job satisfaction, job involvement and organisational commitment. Kinship responsibilities, organisational permissiveness, pay, and supervisory support are significantly related to absence. Job involvement, job satisfaction and organisational commitment do not mediate exogenous determinants. Fichman (1984) rejects the Steers and Rhodes model on the basis that job satisfaction and absence need not be related. He argues that absence may be avoidance behaviour, it may be a rational choice in the face of change in the wage-effort bargain, may be a habit or reflect outside pressures. However, he is unable to offer empirical support for his arguments.

Hackett (1989) examines the conflicting results of three meta-analyses on the link between absenteeism and job satisfaction. The relationships between satisfaction and absence were weaker than predicted by the models used, due to the range of external pressures on individuals to attend. Hackett divided studies in to those that used overall satisfaction, reflecting aspects of the job, whereas those using work satisfaction focused on intrinsic tasks. This corresponds to the Steers and Rhodes (1978) concepts of job context and content. The strongest associations between work satisfaction and absenteeism are discovered when using absence frequency, and this relationship was found to be stronger where respondents were younger, and had shorter tenure. The relation was weaker with a higher proportion of women in the sample – presumably as they are less attached to the labour market. The strongest links between duration of absence and satisfaction were found when employing data on overall satisfaction.

Although the Steers and Rhodes (1978) model underplays the importance of job context variables, satisfaction with the work environment may reflect a positive industrial relations climate. Deery et al (1999) find that absenteeism is negatively

correlated with individual commitment and the industrial relations climate. However,

Edwards & Whitston (1993) found that high group cohesiveness and trust in capital did

not lower absenteeism in the two plants which they studied.

Hypotheses for sub-section c: Absenteeism And Job Satisfaction

In the light of these studies, it is expected that there will be a significantly

negative, if weak, relationship between job satisfaction and absence. This will vary

according to the facet of satisfaction used: content or contextual aspects. For example,

those who are challenged by the nature of their job are less likely to be off. Whilst ease

of transport, good relationships and contentment with this employer may seem

theoretically influential factors, these contextual factors are less likely to be

(significantly) negatively related to absenteeism. A negative relationship could imply

that absence is used as exit, or as voice; a definitive answer to this may arise from

subsequent analysis of absenteeism against a backdrop of better pay and conditions.

d) Absenteeism And Changes To Working Conditions And Pay

Following from the work of Hirschman (1970) and Allen (1984), absence may

be used to indicate to the employer that all is not well in the workplace, particularly in

the absence of other voice mechanisms. Edwards and Whitston's (1993) longitudinal

study of absenteeism in a pharmaceutical factory and warehouse examines absenteeism

during a period when the industrial relations climate deteriorated. Greater product

market competition led to mandatory redundancies amongst the predominantly semi-

skilled workforce, which changed the climate at work. Senior management endeavoured

to change from their previously "sophisticated" and pluralist approach, adopting a more

cost-centred strategy and unitarist style. This included introducing a target of 7-8 per

cent absenteeism, with return to work interviews used as a means to deter voluntary

absence. To change management style methods such as team briefings, cascades, and

meetings with customers were used. The changes proved unpopular and line managers

viewed the absenteeism target in particular as unnecessary. As a result of the changes 39

per cent of those remaining considered leaving and absenteeism increased. This reflects

the anxiety survivors experience after radical organisational change (Littler et al: 2003).

Deery et al (1999) examine how the relationship between trade union and employers in

Australia impacted upon attendance patterns. Although their focus is on union effects,

they hypothesise that changes to working conditions/practices may have beneficial

effects on absence, moderated by demographics and external market conditions. A better industrial relations climate was associated with higher attendance, but changes were more successful where unions were involved in the planning of change.

Training may be a means to improve employee attendance. Katz et al (1983) look at the impact of quality of working life (QWL) programmes in General Motors Plants on economic and industrial relations indicators, including employee absence. Those programmes listed as impacting on QWL included: projects involving employees' families out of hours; community projects; plant environment improvements; off-site problem solving groups and union meetings; drug and alcohol abuse programmes; quality boosting schemes; information sharing; two-way communications schemes; Christmas lunches; and training and up-skilling supervisors. They do not disaggregate the effects of these different schemes. Absenteeism moved sharply in line with changes in the economic cycle, but rose much more slowly where strong efforts to improve QWL were observed. Such workplace changes may have an immediate, direct effect: if the workplace becomes more tolerable this may lead to higher individual morale, possibly lowering absenteeism and turnover in the medium term. Katz et al (1983) argue that introducing QWL programmes can have an additional less direct effect: alleviating conflict and helping to enshrine trust, thus working in opposition to Fox's (1974) high conflict-low trust dynamic. Interestingly, whilst higher absenteeism was linked to lower productivity it was also related (just insignificantly) to higher quality of output, which emphasises that absenteeism may perform a useful function. These results come with some caveats. Longitudinal data were used for this study, but the QWL attitude survey was not administered at the same time, or as often, as the other quality and efficiency data was collected. The measure of absenteeism, contractual hours taken off, is also less sophisticated than most employed, conflating voluntary and involuntary absences.

Krueger and Rouse (1998) take a much narrower focus, looking at the impact of adult education provision for low skilled workers, during working hours, on a number of indicators including absenteeism. Their study covers two plants in New Jersey. Their measure is the fraction of hours missed per week as a function of hours spent in adult education. They find a small beneficial effect. However, there are three particular problems with this study. The training takes place during working hours, so it is not

possible to investigate what impact out of hours education would have. Classes are not held at crucial times for absenteeism, such as Christmas and the holiday season, so it is not possible to see if training can offset seasonal fluctuations in absence rates. The study also covers a short time period so it gives information on the current impact of education. The (unspecified) lagged effect on absenteeism was negligible.

Any improvements in basic pay may be subject to two conflicting influences. The income effect predicts that a higher hourly wage, by raising income, will lead to higher rates of absenteeism (Allen: 1983). The substitution effect predicts that higher hourly wages make the cost of leisure, the alternative use of time, more expensive and therefore less leisure will be desired. These opposing effects will be mediated by any introduction of contingent pay. Any withdrawal of pay as "punishment" for absence is likely to lead to higher attendance. A performance related component is likely to lead to better performance across a range of indicators (Cooke: 1992). Employee voice may also be manifested through employee ownership of the organisation (Bonin:1993). Rhodes and Steers (1980) and Hammer et al (1981) found absenteeism began to fall when employee share ownership was introduced. Brown, D. (1998) investigates longitudinal survival rates at the plant used in this paper. Labour turnover did fall as terms and conditions improved, but grade-related wage increases in May 1996, had the greatest downward effect. This study is flawed in that it failed to consider local unemployment as an external pressure and concentrated on the impact of change on entrants rather than the stock of employees.

Wilson and Peel (1991) use data on a sample of blue collar workers in UK engineering plants during the 1980s to look at the effects of financial participation schemes, and the interaction effects of these with trade unions and works councils. The extant literature showed that unions were associated with higher absences and lower quits, whilst financial participation was linked to lower quits, and ambiguously related to absence. The authors hypothesised that absenteeism and labour turnover would be influenced by labour market, organisational and individual factors, but they focused purely on organisational factors. In order to identify if it was union presence or union influence which was important, they generated a principal components variable representing an index of union position and strength. They find that absenteeism was 8.5 per cent lower in the presence of profit share, 13 per cent lower with share

ownership, and bonuses had a very small negative impact on absenteeism. Quits also fell, though by less. Representative forms of participation were also negatively related to absence. Unionised plants were linked to 6 per cent lower absence, and those with works council 12 per cent . The authors use a panel to look at longitudinal effects but as the sample was limited to firms with profit share and/or share ownership causality is not determined. Brown et al (1999) conduct a similar analysis to Wilson and Peel, but use French panel data. They choose to focus on white-collar workers, as these are under represented in empirical work and may experience greater flexibility with respect to their work schedules, possibly necessitating less time off. They hypothesise that profit sharing and share ownership may cut absenteeism because leisure becomes less attractive – a substitution effect. Therefore the employer gains directly through higher attendance and indirectly by saving on the monitoring and control aspects associated with absenteeism. Absenteeism and wage are negatively correlated. Share ownership cuts absenteeism by 14 per cent , and profit share by 7 per cent . A combination of the two cuts absence by 11 per cent . Whilst linking pay to performance in some way is likely to lower absenteeism it is not addressed in this paper as Bun Factory does not use any form of contingent pay.

Hypotheses for sub-section d: Workplace Change

Improvements to the working environment, in general, may lead to lower absenteeism, with those which are suggested by or negotiated with employees beforehand being the most likely to have an impact. Such a relationship would imply that absence was being used by employees as a voice mechanism to indicate their unhappiness, given a lack of other mechanisms. The impact of grade-related wage increases is ambiguous due to the opposing forces of income and substitution effects, however, given the relatively low level of wages offered at this plant the substitution effect seems more likely. Training should bring benefits to both employer and employee. By enhancing the employee's potential it may be possible to expand their range of tasks and make the job more challenging. Training supervisors should boost workplace efficiency and may also improve the industrial relations climate.

e) Absenteeism As A Predictor Of Quitting – Or Common Roots Theory

Rosse and Miller (1984) outline two distinct theoretical approaches to the relationship between absence and labour turnover. The first posits that both are forms of

withdrawal, with absenteeism potentially spilling over into turnover. The second views them as independent forms of behaviour. There are nuances to each of these approaches. The simplest withdrawal model is that of random spillover. Lateness, absenteeism and turnover all represent forms of withdrawal, and are driven by similar factors. Whilst an individual may engage in one particular form of withdrawal they may also engage in either or both of the others. A more complex version of this theory, progression, hypothesises that an individual will graduate from lateness to absence to turnover. This progression is driven by a worsening of working conditions, or by an awareness that the individual does not fit within their organisation. The empirical work on these two versions of the theory is so inconclusive that it is not possible to distinguish between them.

A further variant of withdrawal theory is that of alternate forms. Individuals may have a preference for a particular form of withdrawal but they may be constrained in their use of it, leading to greater use of another form. Allen (1984) argues that absence will be used, by dissatisfied employees, as a substitute for turnover where the local job market is slack. These constraints may be external, as in the state of the labour market, or may reflect the value system of the individual. So, if they perceive turnover as unacceptable they will manifest withdrawal through lateness or absence. This version is not supported by empirical research. A lack of labour market opportunity, as a result of limited skills rather than poor external options, would also prevent progression through forms of withdrawal. Alternatively, workers may choose to withdraw, to some degree, to avoid an unpleasant or dangerous work environment. This has not been fully explored empirically. In this chapter withdrawal may be interpreted as an indirect voice mechanism – indicating to the employer that something is wrong. A more direct application of voice would require disgruntled employees to attempt to change their working conditions, with withdrawal following a lack of success.

Alternatively, the independent forms model, propounded by Porter and Steers (1973), Steers and Rhodes (1978), Mowday et al (1982), identifies absenteeism and turnover as distinct. This follows from either their different causes or their different consequences. Porter and Steers (1973) argue that absenteeism is not the same as turnover because the negative consequences faced by labour are less serious for absence than for turnover; absence is more likely to be spontaneous; and absence may be a

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substitute for turnover, especially where there a few alternative labour market opportunities. Mobley (1982) identifies several reasons why absence and turnover are not related forms of behaviour. Absence may be caused by positive feelings rather than a desire to avoid work; it may be involuntary in the face of non-work demands; and it is spontaneous. Turnover and absence will not have the same roots if one is a constrained option or if one leads to different consequences than the other. They will follow different patterns if the job allows for discretionary time off, if sick leave can be cashed in at the time of quitting. He also states that absence may be a safety valve which prevents the need for quitting – though this is akin to the substitutability variant of withdrawal theory. By way of support for this position, Steers and Rhodes report that only six of the 22 studies they looked at found a significant overlap in explanatory variables for absenteeism and turnover (1978).

In response, Rosse and Miller (1984) argue that a weak relationship between absence and turnover is to be expected because the relationship is complex and yet is modelled too simply. Mobley (1982) himself takes an inconclusive position. He states that there may be a conceptual but not an empirical link between the two phenomena if the individual uses absence as a safety valve to avoid quitting or if quitting is desired but constrained. Alternatively there will be an empirical relationship between the two if absence is to allow job search, the consequences of both forms of work avoidance are similar and both behaviours are unconstrained, and where dissatisfied staff prefer absence to turnover despite the availability of jobs. Given the consistent but weak relationship found by most research, Rosse and Miller find the independent forms approach is inconsistent with evidence. They conclude that the two phenomena have common roots, particularly in satisfaction. Wilson and Peel (1991) attempt to test the common roots hypothesis using their UK engineering sample. The right hand side variables are common to both models, though the absenteeism model is less well specified than that for turnover. Therefore they use Zellner's seemingly unrelated least squares estimator. The common explanatory variables explain 73 per cent of the variation in permanent and temporary withdrawal, indicating that there is a common link between absence and quits.

Hypotheses for sub-section e: Absenteeism As A Predictor Of Quitting – Or Common Roots Theory

If absenteeism and turnover have common roots, as indicated in the literature discussed, then they will be correlated. The spillover model is the best supported of the approaches discussed. Therefore there should be a sizeable overlap in significant explanatory variables for absence and turnover. The progression version of the spillover model would be supported by a positive relationship between absence in period$_{t-1}$ and turnover in period$_t$.

4. Data

This case study looks at the issue of absenteeism in a medium size food manufacturing plant, Bun Factory, in the outer London area. The data used are from the payroll information bank and personnel files for the period January 1994 to August 16 1996, though the focus will be on July 1995-June 1996, with data for the previous year used as explanatory variables. Observations are available for 1,445 individuals, with each absence spell counting as a separate observation. This provides a data set with 5,055 entries. Historically, Bun Factory performed badly in the product market and experienced high absenteeism and labour turnover. The plant has relied upon an ethnically diverse workforce, predominantly non-native English speakers, including many seeking refugee status. Personnel literature identifies a range of problems faced by new staff: the language barrier; low skills; and transportation issues. For this reason it issues a temporary four-week contract to all starters. It was taken over by a national food manufacturer in 1992, and immediate changes were made to improve its product market performance. Following an improvement in its market position, changes to working conditions and wages were introduced between April 1995 and May 1996. These working practice changes included training, the provision of an all day canteen, and the introduction of team meetings. As appendix B1 indicates, this was the first time a formal voice mechanism had been introduced in this plant. The impact of these different changes will be examined in the results section.

It is possible to derive the tenure and absence history of employees from this sample. Another strength of this data set is that it affords the chance to review payroll records which are most likely to accurately record absences – generally data sets rely

upon individuals' self-reporting. Table 2 presents the monthly statistics on employment levels, quits and absenteeism – in terms of spells and frequency of absence. The table shows that employment levels have fluctuated at around 300 staff. However, absence figures, which are very high, fluctuate much more erratically. The highest number of spells starting in a given month is 248, in March 1995, and the lowest 28 in April 1996. The highest frequency was 74.5 per cent, recorded in April 1995, and highest incidence was 43.3 per cent in December 1995. Figures for frequency and incidence also drop off sharply from March 1996. The number of quits shows a less discernible pattern, and is probably related to the local unemployment rates, a relationship which will be pursued in the results section.

Although the data set does not record the exact reason for taking time off, it is possible to identify which absences were signed off medically, which were self-certified and which remained unexplained. Therefore it is possible to construct a range of absenteeism markers which are reported in table 3, and depicted in figure 1 for 1995-96. The simplest variable is a dummy, offslot, which indicates whether an employee was off between July 1995 and June 1996, hereafter referred to as "year two". Its precursor is offold, which reflects the same information for the earlier year, hereafter "year one". The dummy fell in value between year one and year two, from 56 per cent to 53.4 per cent. An important distinction is made according to whether the time off was voluntary, within the employee's control, or involuntary, due to ill health or perhaps to a family crisis. Taking any voluntary absence over the period is recorded in the dummy "volslot", and involuntary, presumably medically related time off is captured with "involslot". The variable involslot takes a much lower value than volslot: 4.6 per cent as compared to 48.8 per cent for year two. Mowday et al (1982) introduced the concept of attitudinal absence, one day periods of time off, to capture most clearly voluntary time off. This is represented by the variables "attslot" and "attold". In year one 26.5 per cent of absences fitted in to this category, rising to 27.9 per cent in year two. This data set enables us to identify individual spells of time off, "oblsot", and to calculate the total number of days off per year, "newskives". The variable representing total days off is constant over the two year period, at 22 days, with the highest value for year two being 157 and the lowest 0. Obslot is also constant at four spells, over the two years, with a highest value of 28 and lowest of 0. Our variables show that the majority of absence is voluntary, and our analysis will concentrate on manifestations of voluntary time off.

Table 4 presents correlations between the various absenteeism measures. All correlations are significant, most at the 1 per cent level of confidence. The strongest positive relationships, unsurprisingly, are between time off period two and voluntary time off period two, and time off period one and voluntary time off period one. Attitudinal absence is also strongly correlated with time off and especially voluntary time off, reinforcing the argument that this type of absenteeism allows employees to escape the stress of work (Mowday et al: 1982). Involuntary absenteeism measures are negatively correlated with other variables, and small in size, reflecting the small proportion of absence that is due to sickness.

The data indicate the gender, ethnicity, job category, shift pattern, home postal code and pay grade of each employee. Sample means are presented in table 5. The workforce is predominantly male, 90 per cent, and is almost entirely comprised of ethnic minorities. In line with the relatively young age, the mean is 32 years, most workers are single. The factory operates a shift system based around a 45 hour basic working week, with compulsory overtime. Day, afternoon, night, morning and rotating shifts patterns are available, though the commonest by far are days and nights. The plant does not use contingent pay schemes; wages are grade-related, though a 20 per cent shift premium was payable for night work. The majority of staff fall in to the unskilled category, 67 per cent, with around 15 per cent being classified as trainees. Whilst wage increases across the other skill groups were uniform at around 2.5 per cent in 1995 and 3 per cent in 1996, these two groups received different increases. In May 1995 both received a rise of about 5.5 per cent, yet in May 1996 whilst unskilled won 6.5 per cent trainees only received 1 per cent. The plant manager viewed the wages offered as a little worse than those on offer within the local labour market in 1996, see appendix B1. Labour turnover at the plant is also high, and information on the timing of departures, and their cause, is available.

A job satisfaction survey was put to employees in October 1996, and this can be mapped on to payroll data for those still employed at that point. This survey collected details about domestic arrangements: presence of partner and number of children, whether their partner worked. It also collected details on the education, their previous activity before taking this job, and the number of employers they had had over the past three/five years. The questions on job satisfaction related to specific aspects of their job:

material conditions; relationships at work; and the developmental aspects of the position. More than 50 questionnaires were returned which matched the payroll data, providing a data set of 229 observations. This data can be used to explore the relationship between satisfaction and absenteeism. The sample means of this sub-set are presented in appendix B8.

5. Modelling Issues

a) Absenteeism And Demographic, Job Or Workplace Characteristics

Whilst the choice of modelling technique for looking at the probability of absence is straightforward, either a probit or logit model may be used, assumptions about normal distributions may not apply when using a count variable on the left hand side. This data set has information on the total days taken off and the number of spells, both of which represent count variables. As table 3 indicated, the variance of both these variables is as great or greater than the mean. Mastekaasen & Olsen (1998) and Chaudhury and Ng (1992) tested a variety of modelling techniques: OLS; poisson; rank based regression; and negative binomial for use with count measures of absenteeism. The negative binomial model is suitable for use with a non-negative, truncated variable such as number of absence spells or total days off as it makes no assumptions about the distribution of the error term and is less vulnerable to extreme values than OLS. Whilst the OLS was theoretically a less obvious choice, both papers suggest that it is more interpretable and offers robust results. Therefore, this chapter will discuss OLS models in the text with negative binomial regression results presented in appendix B5.

The chapter will focus on voluntary absenteeism, having first sought evidence of difference in the variables explaining voluntary and involuntary absence, and the robustness of the models used. Whilst running separate equations by gender may be the ideal approach (Vistnes: 1997), it requires a large data set, with a fairly even distribution of observations between the two sexes. Results of a log likelihood (Chow) test to estimate the difference in coefficients by sex are presented in appendix B2[i]. As this data set has a low proportion of women, around 10 per cent, merging information on both sexes is preferable.

b) Absenteeism And Lagged Absenteeism, External And Internal Pressures

Avery and Hotz (1984) advocate the use of event history techniques to model absenteeism. This requires that lagged absenteeism be used as an explanatory variable. Markham and McKee (1991) adopt a similar method for identifying the impact of external and internal pressures, represented by changes in local unemployment and plant employment levels. They experimented with different length lags, and determined that the highest level of explanatory power was gained when using contemporaneous changes in plant size, one month anticipatory changes to unemployment and their interaction term. External pressure on employees to avoid taking voluntary time off is proxied here by the monthly travel-to-work area unemployment rate, and the internal pressure by employment numbers at Bun Factory. The correlation between absence spells and local unemployment for this sample is -0.17, which is insignificant, that between absence spells and plant size is 0.13, which is significant at the 1 per cent level. The results section of this paper will introduce absenteeism indicators for the previous year as an explanatory variable. Various measures of plant size and local unemployment at the time of the absence event, and their interaction terms, will also be tested.

c) Absenteeism And Job Satisfaction

If one hypothesised that satisfaction explained to some extent absenteeism, then absenteeism would represent the dependent variable, and satisfaction an explanatory variable. Having both the dependent and this key independent variable for the same period would be preferable. Alternatively, as Markham and McKee (1991) illustrate, workers often anticipate future changes when considering their behaviour, so having satisfaction data preceding payroll information need not be a problem. The payroll and personnel data represent a slightly different calendar period than the satisfaction data. The satisfaction data refer to Autumn 1996, after the changes to wages and workplace conditions have been introduced. Whilst Katz et al (1983) employ non-contemporaneous data in their study of General Motors' QWL programmes, this is not strictly reconcilable, so parametric techniques will not be employed here. Limiting the use made of the satisfaction data avoids the problem of endogeneity which would arise if satisfaction were a function of absenteeism. Therefore the paper will report on patterns of satisfaction. As responses are recorded for contentment with 12 aspects of the job, variation by job context as opposed to job content will be explored. Correlations between job satisfaction and absence will be calculated.

d) Absenteeism And Changes To Working Conditions And Pay

The time span available, two and a half years, covers a number of workplace changes at Bun Factory. The general effect of these changes might be expected to be an improvement in industrial relations climate and morale. Within that period a series of discrete changes were made, and information on the nature and date of each is also available. Wages vary by grade, as do some of the improvements to conditions, so an analysis of difference in differences is employed. This enables variation by grade in the response to each of the changed working conditions and wages to be identified (Wooldridge: 2003). This requires looking for the difference in difference estimator δ_1, where:

$$\delta_1 = (absence_{tw} - absence_{txyz}) - (absence_{t-1w} - absence_{t-1xyz}).$$

w represents the grade in question, whilst xyz are the remaining staff categories, t is the month after the change, whilst t_{-1} is the month before the change. It is also possible to determine the overall impact of the series of changes introduced between April 1995 and May 1996, by grade. However these results were insignificant, due to the very small sample size, and are not reported.

e) Absenteeism As A Predictor Of Quitting – Or Common Roots Theory

A simple way of identifying a link between absence and labour turnover is to investigate whether each is determined by the same explanatory variables. As each can be modelled by a probit equation we will estimate each phenomenon in a probit model with the same right hand side variables. If correlation coefficients confirm a relationship between the two variables this suggests it is necessary to examine the possibility of endogeneity between absence and labour turnover. The preferred solution to endogeneity is to find an instrumental variable. If one accepts the progression model of withdrawal, then absenteeism in year one may explain turnover in year two (Rosse and Miller: 1984). Therefore, lagged absenteeism will be employed as an explanatory variable in a labour turnover equation, thus circumventing the endogeneity problem.

6. Results

a) Absenteeism And Demographics, Job Or Workplace Characteristics

Table 6 present the marginal coefficients from probit estimates of the probabilities of taking time off for any reasons, of taking one or more one-day periods,

and of taking voluntary time off, using a model in the form of equation 1. Probit coefficients are shown in appendix B3, and involuntary absence is examined in full in appendix B4.

Prob (time off) = aX + bY + e   **Equation 1**

where X is a vector of individual characteristics, Y of workplace characteristics and e represents the error term.

Column one reports coefficients explaining the probability of taking time off between July 1995 and June 1996 for any reason. Few explanatory variables reach significance. Those in the white or other ethnic category are almost 20 percentage points less likely to have time off than the default Asian origin group. Those who are widowed, divorced or separated are more likely to take time off, as are the unskilled. The unskilled result, which is highly significant, may be explained by the less challenging nature of the work they perform compared to higher skill groups. In contrast, trainees spend the first four weeks of their employment on a temporary contract which will act as a disincentive to take time off. The lack of significance for better paid semi-skilled and highly skilled employees suggests negligible income and substitution effects. This will be examined again in the context of wage changes. The result for those promoted this year is surprising. This group is 35 percentage points more likely to be off than those who are not promoted; their absence perhaps reflecting their relative security at Bun Factory. Tenure is a strong influence on absence in this and all the subsequent estimations. An additional 100 days' tenure reduces the probability of taking time off by 2 percentage points. Presumably this reflects a compositional effect, with those who find the job unacceptable or unsatisfactory choosing to leave with shorter tenure. The only remaining significant influence is shift patterns. Those on morning, afternoon or rotating shifts are less likely to take time off, though this coefficient is significant only at the 5 per cent level. This probably reflects the greater ability to juggle conflicting responsibilities which comes with working these shifts as opposed to straight night or days.

Column two reports coefficients from the estimation of the probability of attitudinal absence, a subset of voluntary absenteeism. Mowday et al (1982) hypothesise

that one-day periods of absence can be used as a very good proxy for voluntary time off – and may indicate that employees need to escape from stress at work. This model is slightly less robust than the previous one, and only four coefficients achieve significance. The white or other ethnic category and married employees are less likely to be off than the default, whilst those who are promoted this year are 24 points more likely to take a one-day period. Tenure has a reduced effect on absence here: each additional 100 days' tenure reduces the probability of a one-day spell by one percentage point.

The final column contrasts the results of the full voluntary absence models. The results for voluntary absence are almost the same as those for aggregated time off. To explore more clearly the effects of these variables we employ benchmark employees, table 7. The table starts by identifying the predicted probability that an individual in the default category would be off during the individual period July 1995 to June 1996. This individual is a single male, of Asian origin aged 36-45, who is a semi-skilled day worker living two to five miles from the plant with average employment tenure. Characteristics are changed in turn until the default becomes an unskilled married woman aged more than 45 years of afro-caribbean origin, who lives very close to the plant, has longer tenure and works nights.

The table shows the predicted probability, first if all characteristics are assumed to affect the chance of time off significantly, and later concentrates upon those which table 6 indicated were statistically influential. The first row indicates that changing sex is important and lowers the probability from 0.52 to 0.5, whilst aging the default individual adds more than 6 percentage points to the likelihood. The change in ethnicity is negligible, but changing marital status from single to married sees the likelihood fall more than 3 percentage points. Reclassifying this individual as unskilled has a very striking effect, with the probability of absence rising almost 10 percentage points to 0.61. Changing shift and address have small impacts, particularly when compared to the tenure effect. Increasing tenure from the mean of 494 days to 794 days cuts 7 percentage points off the probability of absence, giving a final figure of 0.54. The bottom row concentrates on those variables which are statistically significant in table 6. From a baseline probability of 0.52, reclassifying by skill increases the likelihood of

time off to 0.62. The only other significant independent variable is tenure which cuts the probability from 0.62 to 0.54.

This method of depicting the influence of independent variables highlights the significance of skill group and tenure, and other significant variables included ethnicity and promotion. This model had better diagnostics than that for undifferentiated absence, in contrast, the model for involuntary time off achieves a low level of robustness, see the log likelihood in appendix B4, and few coefficients are significant. This reinforces how important it is to have information on health if modelling involuntary absence. Therefore the rest of paper will report only voluntary absences.

The data set offers the opportunity to investigate absenteeism in detail: information on the number of days off; number of spells; and number of attitudinal absences from July 1995 to June 1996 is available. The negative binomial regression is the most theoretically applicable modelling technique, as discussed above. However, the results of this technique are generally no more robust than OLS techniques, and are less easy to interpret. For this reason table 8 presents OLS models, estimated following Equation 2, with the results from negative binomial models shown in appendix B5.

OLS (count of time off) = aX + bY + e   **Equation 2**

Column one presents estimates for total days off. The mean number of days off, volnewsk, between July 1995 and June 1996 was nine. Married workers take one day more than their single peers and those falling in to the "other marital" status category have significantly more than this: 21, though there is no obvious theoretical reason for this. Employee grade is influential. The unskilled take an additional two days, the highly skilled five days fewer, and trainees four days fewer than the default. The greater number of days taken by unskilled workers is likely to reflect the repetitive nature of the work and their relative job security. Those promoted during this year are also likely to feel secure in their positions. They take an additional four days off per year, a result which is very highly significant. Contrary to the majority of findings, women in this sample take fewer days off, four less than the average. As these estimations use voluntary absences, we have excluded time off for health reasons. This is the primary cause of women's greater absence according to Vistnes (1997). Ethnicity is strongly

significant. Compared to the default group, workers of Asian origin, Afro-Caribbean employees take an extra two days off whilst white/other employees take four fewer.

Delgado and Kniesner (1997) find that distance between work and home is positively related to time off, yet workers in this sample living more than five miles from work take one fewer day off. Those working nights take more time off, an extra three days, and those on morning, afternoon or rotating shifts take four days fewer than day shift workers. This reinforces the argument that flexibility is important to workers (Allen: 1981, 1983). Allen (1983) also predicts that young workers will take more time off, though this only applies to voluntary time off (Chaudhury and Ng: 1992). Those aged 46 or older take one day less per year, a result which just misses significance. Prime aged workers of 26-35 years take an extra day off, a result which may reflect family responsibilities. Tenure has a significant influence on total days off. Each additional one hundred days of service reduces the total number of absences by one third of a day.

The results for spells of absenteeism are somewhat different in terms of coefficient size and significance, column 2 of table 8. The default number of spells, volnewob, over the period was three. Two explanatory variables are significant in this model but not the previous one: those aged 46 or older are likely to have one fewer spell; and those living very near by have an additional half of one spell. The results for distance from work are counterintuitive as the company does not provide transport for those living further away, appendix B1, so it is not obvious why this result arises. Although the spells model achieves a higher R^2, analysis will concentrate on total days taken off as this gives a clearer idea of the magnitude of absenteeism.

The estimation of the number of attitudinal absence spells, countatt, sees a large number of significant coefficients. The mean number of attitudinal absences, spells of just one day, is two per individual for the period July 1995 until June 1996. Ethnicity is an influential factor, as is gender and shift pattern. Marital status is also significant: divorced and widowed workers take four spells; whilst married employees will take just under the mean. Skill groups affect the number of one-day spells of absenteeism. The highest skill group are the most significantly different to the default group, taking just one attitudinal spell per year, trainees take around one half of a spell less than the mean

and the unskilled take an additional one quarter. Obviously trainees will be deterred from taking unnecessary time off by their temporary contractual status. The unskilled have job security but, as mentioned before, presumably not much scope to be challenged in their role. The coefficients on distance between home and work continue to show unexpected signs. Those within two miles of the Bun Factory take half of an additional one-day spell, and those living more than five miles away take slightly less than the average of two, though the latter is not significant. Contrary to the theoretical prediction that young workers will be less reliable, those aged under 25 are less likely to take attitudinal spells, taking one and three quarters as opposed to the mean of two.

We hypothesised that women, those on day or night shifts, younger workers, the lowest skilled employees and those living far from the plant would have a greater likelihood of taking time off. These hypotheses were largely proven to be incorrect. Across the probit equations three variables retain a significant influence: those classed as white/other are repeatedly less likely to take time off; employee tenure reduces the likelihood of time off by a small but reasonably consistent amount; those who were promoted in the previous year are considerably more likely to be off. Whilst the tenure result is intuitive, those who dislike this work will hunt for other opportunities, the promotion result is startling. Those who are promoted seem to exploit their position in the company in order to miss work. A much wider range of influences recur in the count equations. Whites, women, trainees, the highly skilled and those on more flexible shifts were shown to take significantly less time off in all three models. Those promoted, workers of afro-caribbean descent, divorced or separated workers, the unskilled and night workers were likely to take more time off than the average in all of the models. Tenure was also a significant influence, though it changed sign from positive to negative in the final (attitudinal absence) model. Here the result for women is most surprising, extant literature shows women to have a much higher rate of absence, for a variety of reasons (Vistnes: 1997, Masktekaasen and Olsen: 1998, Chaudhury and Ng: 1992). For clarity the rest of the paper will focus on just two manifestations of absence: on the probability of voluntary absence, and total voluntary days off.

b) Absenteeism And Lagged Absenteeism, External And Internal Pressures

Table 9 presents selected marginal coefficients from a probit model examining the influence of total days voluntary absence in year one, plant employment levels and

local unemployment on the probability of taking time off in year two. The full results can be found in appendix B6, whilst probit coefficients are reported in appendix B7.

Prob (voluntary time off$_t$) = aX + bY + cZ + dT$_{t-1}$ + e   **Equation 3**

where X is a vector of individual characteristics, Y of workplace characteristics, Z represents internal and external pressures, T$_{t-1}$ represents voluntary days off in the previous year, and e represents the error term.

Following Markham and McKee (1991), variations of the model are constructed using one-month lagged, current, and one month anticipatory values of both plant size and local unemployment for the month in which absence occurs. This provides nine potential variations of the equation. Falling plant employment and rising local unemployment would theoretically reduce job opportunities and lead to lower labour turnover. Conversely, rising employment levels and falling local unemployment, by increasing employees' prospects, should lead to higher levels of absenteeism. Whereas the unemployment coefficient is of varying size and significance across the different models, it is more consistent in those variations using next month's employment level at Bun Factory. In versions 7-9, the unemployment coefficients are all sizeably positive, and Bun Factory employment levels are consistently related to a greater probability of taking voluntary time off.

The most successful model in terms of diagnostics, version 7, combines anticipatory employment with last month's local unemployment rate. Unemployment is positively related to the probability of absence, a one-unit change in last month's unemployment increases the probability of voluntary absence by 257 percentage points, which is counterintuitive but may reflect the fact that unemployment was relatively stable over the course of the sample. Each one-unit change in next month's employment at Bun Factory changes the probability of taking time off very slightly, which suggests that employees are sensitive to their firm's labour demand and so feel more confident that there will be no repercussions if they take time off. The interaction terms between local unemployment and plant employment are generally negative, small but significant. In version 7 the combination of anticipatory employment and lagged unemployment is

marginally negatively related to the chance of voluntary time off. Introducing the number of voluntary days off in year one as an explanatory variable is consistently weakly, but significantly negatively related to time off in year two. The average number of days missed in year one for voluntary reasons is 11. Each additional day taken off last year lowers the chance of absence in year two by less than one hundredth of a percentage point. Across all nine possible versions of the model tenure has a consistently small but significantly negative coefficient. Each additional 100 days of service lowers the probability that time off is chosen by around 1.5 percentage points.

As table 9 shows, introducing internal and external pressures and lagged absence massively increases the explanatory power of the probit model. Both the log likelihood and pseudo R^2 are greatly enhanced. However, few demographic and workplace explanatory variables retain significance, see appendix B6. We hypothesised that local unemployment would be negatively related to absence and plant employment positively so. Contrary to expectations, unemployment and plant employment are both positively related to absence in most models. The failure of absenteeism to reflect local unemployment levels shows a lack of rationality on the part of employees. This is surely due to the stable rate of unemployment over the year. Whilst the unemployment result is surprising, employees are taking some signals about the state of labour demand and hence their job security from plant employment levels. Lagged absence is consistently negatively related to contemporaneous absence, though the coefficient is small. Whilst focusing on voluntary absence eliminates the effect of continuing poor health, the correlation of absence over time is not surprising.

c) Aspects Of Job Satisfaction

A subset of employees completed questionnaires during Autumn 1996, which asked both a range of demographic and job satisfaction questions. Sample means for this sub-set are presented in appendix B8. The mean responses to questions about satisfaction with various aspects of the job are presented in table 10. The aspects of job satisfaction are grouped in to those representing job context and those reflecting job content. Those questions reflecting job content ask about promotional prospects, the degree of interest and challenge provided by the work, intent to stay and fatigue levels. Context variables are those related to transportation, relationships and hours. Pay and overall satisfaction fall outside the two groupings. Overall, employees are least happy

with their pay, and most happy with relationships with their co-workers. There is no clear indication that respondents were happier with context than content, or vice versa.

If absence is perceived to be a vehicle for employee voice, then satisfaction and absence will be negatively correlated. Table 11 shows correlations between aspects of satisfaction and a range of variables representing absenteeism. Again we focus on the probability of voluntary absence and the total number of days off, a comprehensive analysis is reported in appendix B9. In column 1 the reported correlation coefficients indicate whether there is a relationship between a dummy indicating whether the respondent was off work for non-medical reasons during the sample window (volslot) and satisfaction aspects. Three correlation coefficients achieve significance, though they are not all in the direction hypothesised. Unsurprisingly those who report being tired are more likely to take time off, and those reporting good relations with peers are less likely to do so. This suggests that peer pressure may work in the employer's favour to reduce absenteeism, as argued by Garrahan and Stewart (1992). Those expecting promotion have more to lose by taking unnecessary time off. However, those reporting that they saw their promotion prospects as good were more likely to be off. This corresponds to the earlier probit equations, which saw that those who were promoted during year two were more likely to take time off. Perhaps these workers are confident that their jobs are secure even if they choose to miss work, implying that the firm accepts high levels of absenteeism from otherwise "good" workers. Such an interpretation is consistent with a hedonic model of the labour market, in which Bun Factory is a low wage-high absence employer.

Columns 2 and 3 look at the relationship between satisfaction aspects and the total number of days off this year and last, respectively. A greater number of coefficients reach significance than using the probability absence variable. Total days off is negatively related to two job content variables: a desire to remain in this job and an interest in food manufacturing. Two context variables have a similarly common negative relationship: the ease of getting to work and a positive view of the employer. In complete contradiction of the result in column one, total days off is positively related to good relationships with peers. This suggests that concern for peers does not reduce absence. It is possible that good relations allow workers to generate their own norms about what constitutes acceptable absence. The positive correlation between time off

and promotion prospects also disappears. Those who view their job as challenging are significantly more likely to be off. This suggests that a taxing or stimulating job is not always a positive. The main differences when using last year's total days off relate to content aspects of work. There is no relationship between lagged days off and an interest in the business. Promotion prospects and tiredness are negatively related to lagged days off, whilst being unrelated to current days off. These inconsistencies suggest that satisfaction is not constant over time. Overall job satisfaction and lagged days off are also significantly negatively related, which might be capturing the unhappiness of employees unable to find a more satisfactory alternative job.

A negative relationship between satisfaction and absence is consistent with the idea that employees take time off to indicate that they are unhappy – implying that absence is a voice mechanism. Overall both job content and job context variables are related to absenteeism, although the coefficients are inconsistent across the three absenteeism variables. For example, whilst good relations with colleagues is linked to more days off both in the current and previous year, good relations between peers is linked to a lower probability of absence. That relationships between total days off this year and last, and satisfaction are also inconsistent suggests that satisfaction is an unstable construct which is not closely related to absenteeism. This makes the work of an employer hoping to reduce absenteeism that much harder.

d) Workplace Change

Following a strengthening of their position in the product market, the company introduced a sequence of changes in working conditions and pay, outlined in table 12. From April 1995 attempts were made to change the company culture. Basic food hygiene training was introduced for all workers and the company also initiated training for their line leaders. This change was closely followed by the annual May pay round. Trainees and unskilled workers benefited the most. At around 5.5 per cent their pay rises were worth one and a half times the rate of inflation whereas their colleagues took a real wage cut, receiving increases worth only two thirds of the inflation rate of the time. The uneven nature of these increases reflected attempts to reduce the much higher turnover rates exhibited by trainees and the unskilled.

In November 1995 the company moved to further improve working conditions. Again the company made progressive moves to change its culture, introducing team briefings. Prior to this introduction of team briefings, Bun Factory had used no voice mechanisms. Deery et al (1999) find that incorporating employee voice is important when introducing change and increases the benefits that may be derived from it. Therefore, this move might be expected to improve morale and possibly to elicit productivity enhancing suggestions. Union recognition was not introduced until 1999. On a more substantive note new canteen facilities were introduced, incorporating for the first time 24 hour vending facilities to cater for shift workers. The 1996 May pay round saw different groups of workers, this time including skilled staff, benefiting at the expense of trainees. Whereas semi-skilled, skilled, engineers and section leaders all gained wage rises comfortably in excess of inflation, then 2.2 per cent, trainees only gained an increase of 1 per cent. However, the biggest winners were the unskilled who again saw a significant increase, this time 6.5 per cent.

The sum of these changes had a significant impact upon labour turnover: new starters had a 60 per cent chance of leaving in their first three months in 1994, falling to 10 per cent in 1996 and 20 per cent in 1997 by which time all the HR changes were in place (Brown: 1998). The biggest impact on turnover rates was derived from wage increases. Table 13a looks at the impact of changes on absenteeism by employee grade over the period March 1995 until May 1995, using a technique called "difference in difference". This relies upon estimations of the following model:

$$\Delta \text{ (time off)} = \beta_0 + \delta_0\text{Time} + \beta_1\text{Grade} + \delta_1(\text{Time*Grade}) + e \qquad \textbf{Equation 4}$$

where time takes a value of one in the second period, and is 0 otherwise; and the penultimate expression shows the extra effect by grade in the second period. This enables us to isolate any changes in absence following the introduction of training programmes in April 1995. The first row of the table shows that there is a significant fall in absenteeism across the period, for all but unskilled workers. The coefficients on grade are significantly negative for three skill groups; trainees, semiskilled and the highest skill group, indicating falls in absence of between 6 and 7 percentage points. However, the coefficient on the unskilled indicates that they saw an increased probability of voluntary absence, of 8 percentage points. If the effect of the time trend,

grade effect and the interaction of the two is combined the two highest skill groups react to changed working conditions by lowering absence by around 8 percentage points; the effect for the unskilled is neutral, and trainees' tendency to be absent rises by 43 percentage points.

Table 13b looks at the change between April and June 1995, capturing the effect of differential pay rises in May, benefiting trainees and the unskilled far more than other workers. Again there appears to be a downward trend in absence of between four and five percentage points for all but the unskilled. Grade and interaction effects are insignificant. Previous work found that the pay rises were successful in reducing labour turnover (Brown: 1998), yet these results suggest that differential pay rises are not a strategy that lowers absenteeism. Table 13c looks at changes in absenteeism between October and December of 1995. In November the first voice mechanism was introduced, team briefings, and the canteen began to offer 24-hour cover. This time the downward time trend in absence is only apparent for unskilled workers. Reactions by grade vary: absenteeism amongst trainees and the unskilled is unchanged, whilst that for the two higher skill groups falls by around 3 percentage points, perhaps in response to the opportunity to use a formal voice mechanism. The May 1996 pay increases benefited the unskilled, with trainees in particular falling behind inflation. However, table 13d shows that no trend in absenteeism is discernible. Trainees and the semi-skilled react by dropping their absenteeism slightly, by around 2 percentage points but again the unskilled, benefiting from a higher percentage rise, do not change their behaviour.

The tables show a general downward trend over time, which could reflect a better industrial relations climate as a result of the combined measures, but little reaction to discrete workplace changes from employees. This is not consistent with the idea that absence was being used as a form of voice, but purely as muted or partial exit. The investigation in to the effects of these changes on labour turnover found significant improvements after these changes, particularly following wage rises (Brown: 1998). When looking at absenteeism, wages rises had less impact than other forms of workplace change, with the first round of changes, including training and job security being the most influential. Different grades exhibited different reactions to the changes,

though it is clear that the two more highly skilled groups were more responsive than other groups.

e) Absenteeism As A Predictor Of Quitting – Or Common Roots Theory

Table 14 presents correlations between labour turnover, defined by a dummy variable, and our two main measures of absenteeism; a broader analysis is reported in appendix B11. Columns one and two use current labour turnover and absenteeism, whilst columns three and four use absenteeism measures from the previous year, year one. Correlations between current absence and labour turnover would be consistent with the spillover exit model (+) or the alternate forms model (-), whilst a positive relationship between current turnover and lagged absence would be supportive of the progression model (Rosse and Miller: 1984, Allen: 1984). A lack of significant correlation coefficients would be consistent with the independent forms explanation of exit (Mowday et al: 1982).

Restricting the use of information on turnover to those who can be shown to have left voluntarily makes a difference; voluntary quits are negatively related to the probability of voluntary absence whilst all turnover is not. This is consistent with the alternate forms model of exit. However, this is undermined by the positive correlation between total days off and voluntary turnover which is more in line with a spillover explanation. Columns three and four repeat the previous investigations using absenteeism data from the previous year, resulting in fewer significant relationships. The probability of time off last year is negatively related to undifferentiated labour turnover, a result which is only compatible with the independent behaviour interpretation of absence.

To clarify the relationship between absence and turnover we next look to see whether the same factors are significant independent variables in absenteeism and turnover equations. This requires that we reuse the previous model of absenteeism, replacing absence with turnover on the left hand side:

Prob (leaving) = aX + bY + e   **Equation 5**

where X is a vector of individual characteristics, Y of workplace characteristics and e represents the error term. The marginal coefficients from the regression are presented in table 15, with probit results given in appendix B12.

Column 1 of table 15 reports the results using the probability of turnover for any reason. Following Wilson and Peel (1991), if absenteeism and turnover have common roots then we expect to find common explanatory variables. However, when comparing the coefficients on variables in the undifferentiated labour turnover equation with those on undifferentiated absence (table 6, column 1) we find few variables are significant in both. Unskilled workers are significantly more likely to be off and to leave, presumably reflecting the lack of stimulation in their work. Tenure in both models has a dampening effect, though it is greater in the absenteeism model. This is likely to reflect a sample selection effect, with the more dissatisfied leaving quickly.

Column two limits the definition of turnover to those departures generated by employees and adds in internal and external pressures, as represented by log of plant employment next month and last month's local unemployment rate:

Prob (leaving) = aX + bY + cZ + e   **Equation 6**

where X is a vector of individual characteristics, Y of workplace characteristics, Z represents internal and external pressures, and e represents the error term. The most comparable results are to be found in model 7 of table 9, which uses the same external and internal pressures to explain voluntary absenteeism. Appendix B13 reports the marginal coefficients from this equation using all variants of unemployment and plant employment.

Current or future plant employment has a significantly positive relationship with absence in all variations of equation 3, as reported in table 9, though the coefficients varied in size. In the absenteeism model this was interpreted as indicating employee confidence in a buoyant state of labour demand at the plant. In this model the coefficient is negative, but small and insignificant. In the absenteeism models local unemployment is most often positively related to quits, though more strongly than plant employment. Whilst this may appear irrational, with a slack labour market deterring

risk, it could reflect the relative stability of the unemployment rate at that time and the greater importance attached by employees to their plant's labour demand. In the turnover model, last month's unemployment rate has a small (insignificant) negative relationship with turnover.

Few demographic or workplace variables showed up in the extended absenteeism models, however, associations prove more significant in the turnover equations. Replicating the earlier analysis of benchmark employees in table 7, we alter employee characteristics to find the effect of various demographics and workplace variables on the predicted probability of quitting, table 16. The predicted probability of quitting for our standard default individual is 0.21. Changing the sex and age of our individual, to become an older woman, has no significant impact on the probability of quitting. The next change is ethnic grouping, and moving from Asian to Afro-Caribbean descent lowers the likelihood of leaving to 0.13. Altering marital status is important, raising the probability by 10 percentage points. Married women have traditionally been less attached to the labour market, but this data set is male dominated. It may be that the result is due to the presence of a working partner, bolstering their financial position or that it is driven by the need for better wages to support families than on offer at Bun Factory. Changing the skill level from semi to unskilled further adds to the likelihood, which is now 0.30. Working nights instead of days lowers the probability by 8 percentage points, which is probably linked to the shift premium. Distance from work, indicating convenience, is again an important factor: reducing the travel to work distance lowers our probability to 0.14. Distance had no impact upon absenteeism decisions, which strengthens the impression that employees weigh up different factors when considering absence and resignation. Tenure had a consistently small negative relationship with absence, and this effect holds in the turnover model. Moving from mean tenure to an employment of 794 days sees the probability of quitting drop to a mere 0.03.

Both the spillover and progression models of exit are based upon the argument that absence and exit have common roots. So far our data are inconsistent with common roots. Looking at the progression model in particular, this argues that employees using absence as a weak form of exit in period one are likely to quit, the strongest

manifestation of exit, in the following period (Rosse and Miller: 1984). To investigate this the model represented by equation 7 is estimated:

Prob (voluntary quits$_t$) = aX + bY + cZ + dT$_{t-1}$ + e   **Equation 7**

where X is a vector of individual characteristics, Y of workplace characteristics, Z represents internal and external pressures, T$_{t-1}$ represents total voluntary days off in the previous year, and e represents the error term. The results are presented in the final column of table 15, the corresponding probit coefficients are shown in appendix B12.

Previous examination in this chapter has shown that different demographic and workplace variables play significant roles in the various absence and labour turnover models. This is more consistent with the independent forms approach to exit than the progression model (Mowday et al: 1982). Looking directly at the coefficients on the lagged absenteeism variable presents evidence to the contrary. The coefficient on lagged total days indicates that there is a small positive effect, which supports the progression argument that workers' dissatisfaction will manifest itself in stronger forms of exit over time. The predicted probability of absence is 0.21, rising to 0.3 if total lagged days off is twice the mean value, at 22 days. The impact of external and internal pressures, and their interaction, on voluntary labour turnover are again wholly insignificant, with the other explanatory variables yielding very similar coefficients to those discussed above.

This section of the chapter has looked for evidence to support various explanations of a relationship between absence and quitting. The spillover model argues that the desire to "withdraw" one's labour will manifest itself in both absence and quitting, alternate forms suggest behaviour is constrained, so only the easiest or unconstrained manifestation will be visible, whilst progression posits an escalation over time from absence to quitting (Rosse and Miller: 1984). Aside from these explanations comes the argument that absence and quitting are totally different forms of behaviour with difference causes and consequences (Mowday et al: 1982). A negative relationship between absenteeism and contemporaneous turnover in our data would be consistent with the alternative forms hypothesis, a positive one suggests the spillover interpretation is correct, whilst a positive relationship between lagged absence and quitting would

suggest the progression model was more realistic. Correlations between contemporaneous absenteeism and voluntary turnover dummies are inconsistent: the correlation with the probability of absence dummy suggesting alternative forms and the count variable indicating the spillover model. Relationships between lagged absenteeism variables and turnover in year two were also inconsistent, and indicated no relationship between the two phenomena. Variation in the coefficients on demographic and workplace variables across the absence and turnover models is inconsistent with common roots, but when lagged absenteeism is entered as an explanatory variable in a quit model the results contradict this impression. We have weak support for the argument that quitting is a progression from absenteeism for some employees.

7. Conclusions

This chapter uses case study data from Bun Factory, a food manufacturer in the greater London area in the mid-1990s. Several years' personnel data and payroll information were made available, and these were mapped in to staff satisfaction questionnaires for a sub-set of all staff. Absenteeism at Bun Factory was very high: the probability of being off between 1995 and 1996 is almost 50 per cent; the average total number of days off was nine. Comparison with WIRS data shows that Bun Factory had a significant problem with absence relative to other industries, a problem that they began to address after their takeover by a large national food company. This data set offers the opportunity to test the stylised facts of absence on an atypical workforce: workers here earn relatively low levels of pay and employment of ethnic minorities is very high. Our interest in voluntary absence arises from the recognition that may operate as a manifestation of exit or an informal voice mechanism. Dissatisfied consumers are faced with two choices when they experience a decline in service from a supplier of a service or product they enjoy: voice or exit. This approach is transferable to the labour market, where it can be applied to the relationship between an employee and their employing organisation. Absenteeism represents a means of temporarily exiting from an unsatisfactory, tiring or dangerous work situation. Bun Factory had no formalised voice mechanism until the introduction of team briefings in late 1995. Trade union recognition, a more established vehicle for meaningful two-way communication was not agreed until 1999. For this reason absenteeism patterns are of interest as absence might also be playing a voice role. Various features of absenteeism at the plant

were investigated, along with the possibility that absence was used in either an exit or a voice capacity.

Comparing previous work on absenteeism is complicated because of the range of definitions employed. The richness of the data enabled us to look at the results across many definitions of absenteeism, though the main reporting is of the probability of voluntary absence across the year and the total number of days taken off voluntarily. Certain demographic and job-related factors were consistently related to absence: those promoted were much more likely to take time off; the unskilled, whites and those on flexible shifts were less likely to be off. Women took significantly fewer days off than men, as did those living more than five miles from the plant. Whilst absenteeism was sensitive to plant labour demand, the local rate of unemployment was positively related to time off which indicates that employees attach more importance to job security than the availability of other jobs. These findings counter many of the stylised facts of absenteeism.

Employees at Bun Factory were remarkably satisfied with most aspects of their job, with relationships being viewed particularly favourably. Correlations between forms of satisfaction and absence were generally negative, which suggests that absence might have been used as a voice mechanism. However, the satisfaction questionnaires were distributed after the end date of the payroll and personnel samples. Reaching a conclusion on the relationship between absence and voice would have been easier with an earlier distribution of satisfaction questionnaires to employees. The takeover of Bun Factory by a national company was followed by a series of improvements to pay and working conditions aimed at improving performance and lowering quits and absence. However, longitudinal analysis shows that whilst absence at Bun Factory seemed to decline over time, it had not fallen significantly in response to the discrete workplace changes such as pay rises or training. This undermines the absence as voice hypothesis, although the decline could be in response to a better climate emanating from the combined package of changes.

Absence and quitting may be entirely separate phenomena but a body of work exists which identifies a number of models relating absence and quitting: absence may be a form of exit which is open to employees whose options are constrained, alternate

forms; the desire to withdraw may manifest itself through both quitting and absence, spillover; absence in one period may lead to quitting in the next, progression. Our correlation evidence was contradictory. However regression analysis suggests Bun Factory's employees progress from voluntary absence to voluntary turnover.

We have highlighted the importance of testing stylised facts on new data sets. The chapter challenges many of the stylised facts of absenteeism, notably in finding women more reliable and those who are promoted less so, reflecting the combination of the demographic pattern of employees and the working conditions on offer. The reaction of different grades of employees to the discrete improvements in conditions showed limited variation, and the results were inconsistent with the idea that absence was used as a form of voice. The analysis tested various models of the relationship between absence and quitting and found evidence to support the hypothesis that absence is used as a precursor to quitting.

Endnotes

i. Separating data by gender does seem to suggest that the coefficients are significantly different: however, the female sample is rather small (less than 10 per cent of the total).

Figure 1. Absenteeism data for Bun Factory, July 1995-June 1996
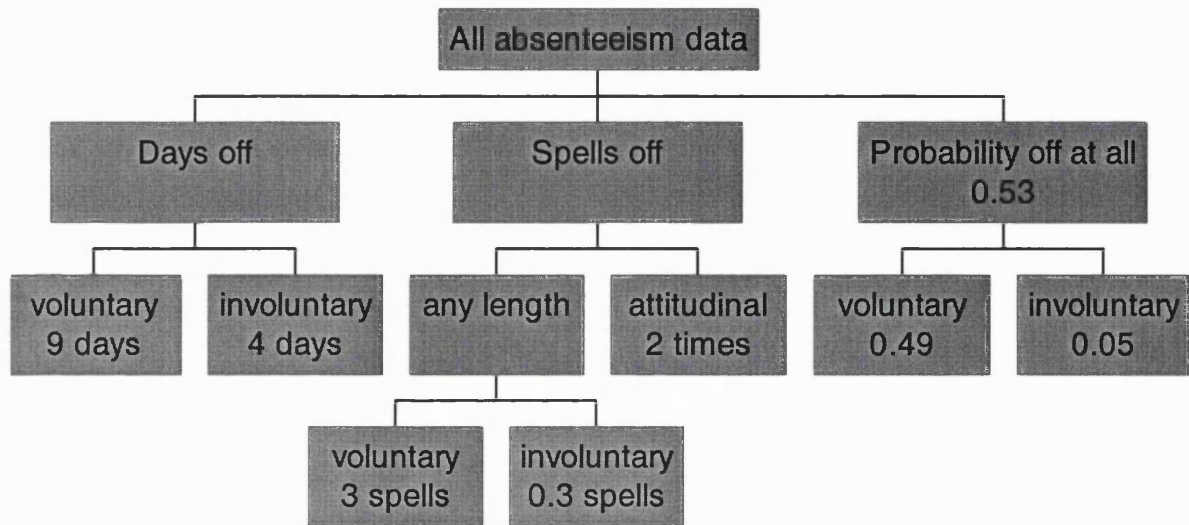
Table 1. Absence Rates By Industry, WIRS Data

Main activity (Sic 1992)	Less than 2%	2% - <4%	4% - <6%	6% - <8%	8% or more	Total
Manufacturing	13.5 (10.0)	39.4 (15.2)	29.9 (36.7)	8.8 (30.4)	8.4 (17.7)	100.00 (100.00)
All non-manufacturing	23.0 (6.4)	36.4 (15.6)	21.8 (38.5)	7.6 (14.7)	11.2 (24.8)	100.00 (100.00)
Electricity, gas, water	20.83 (0.0)	62.5 (0.0)	12.5 (44.4)	1.4 (22.2)	2.8 (33.3)	100.00 (100.00)
Construction	36.6 (0.0)	35.5 (33.3)	14.0 (66.7)	7.5 (0.0)	6.5 (0.0)	100.00 (100.00)
Wholesale & retail	20.8 (8.0)	37.2 (12.0)	20.1 (44.0)	13.0 (24.0)	8.9 (12.0)	100.00 (100.00)
Hotels & restaurants	37.4 (25.0)	23.1 (50.0)	16.5 (0.0)	7.7 (0.0)	15.4 (25.0)	100.00 (100.00)
Transport & telecoms	15.9 (11.1)	28.0 (11.1)	29.9 (50.0)	10.3 (5.6)	15.9 (22.2)	100.00 (100.00)
Finance	17.7 (0.0)	50.6 (20.0)	21.5 (40.0)	0.00 (20.0)	10.1 (20.0)	100.00 (100.00)
Other business services	33.7 (16.7)	28.5 (16.7)	18.6 (33.3)	5.2 (16.7)	14.0 (16.7)	100.00 (100.00)
Public admin	7.6 (7.7)	39.6 (15.4)	29.9 (30.8)	13.2 (15.4)	9.7 (30.8)	100.00 (100.00)
Education	24.9 (0.0)	37.8 (50.0)	18.1 (25.0)	8.8 (12.5)	10.4 (12.5)	100.00 (100.00)
Health & social work	11.9 (0.0)	22.8 (0.0)	35.2 (30.0)	9.9 (10.0)	20.3 (60.0)	100.00 (100.00)
Other services	25.8 (0.0)	34.8 (12.5)	23.6 (37.5)	6.7 (12.5)	9.0 (37.5)	100.00 (100.00)
Total	20.8 (3.7)	35.5 (15.4)	23.8 (37.8)	8.7 (21.3)	11.3 (21.8)	1785 100.00 (188) (00.00)

Source: The definition of absence used is "the percentage of staff off sick over the last 12 months". Respondents are not asked about total days' sick leave.
WERS 1998 data are presented with WIRS 1990 percentages in brackets. As the 1990 survey gave the option to state absence for the last week, month, quarter or year, cells contain fewer observations for that year.

Table 2. Absenteeism Statistics For "Bun Factory"

Month & year	Total employees	Total spells off starting this month	Frequency (%)	Incidence	Quits	Month & year	Total employees	Total spells off starting this month	Frequency (%)	Incidence	Quits
July 1994	311	127	40.8	29.6	29	July 1995	328	196	59.8	37.2	16
August 1994	312	133	42.6	29.8	22	August 1995	319	125	39.2	27.6	31
September 1994	311	154	49.5	33.1	19	September 1995	306	141	46.1	30.7	28
October 1994	313	171	54.6	31.9	38	October 1995	316	194	61.4	38.9	21
November 1994	324	175	54.0	35.8	50	November 1995	366	181	49.5	32.2	20
December 1994	308	165	53.6	32.8	39	December 1995	330	223	67.6	43.3	40
January 1995	318	223	70.1	42.8	17	January 1996	297	174	58.6	36.4	46
February 1995	311	183	58.8	38.3	33	February 1996	289	140	48.4	32.9	22
March 1995	333	248	74.5	42.9	21	March 1996	297	132	44.4	32.3	18
April 1995	334	187	56.0	35.9	15	April 1996	317	28	8.8	8.2	16
May 1995	331	155	47.0	29.6	16	May 1996	324	55	17.0	15.4	22
June 1995	324	202	62.3	38.3	28	June 1996	312	66	21.2	18.3	23

The monthly frequency is calculated as follows: $\dfrac{\text{total spells of absence}}{\text{total employees.}} * 100$

The monthly incidence is calculated as follows: $\dfrac{\text{total number of employees with one or more spells}}{\text{total employees}} * 100$

Table 3. Absenteeism Variables

Variable (n)	Definition	Mean (sd)	Variable (n)	Definition	Mean (sd)
Offslot (3082)	Took any time off July1995-June 1996	53.4% (0.01)	Offold (3806)	Took any time off July1994-June 1995	55.7% (0.01)
Newskives (3802)	Total days off July1995-June 1996	22 days (22 days)	Oldskives (3806)	Total days off July1994-June 1995	22 days (22 days)
Obslot (3082)	Number of spells July 1995-June1996	4 (5)	Obsold (3086)	Number of spells July 1994-June1995	4(5)
Invoslot (3082)	Took medically certified time off July 1995-June1996	4.6% (0.00)	Involold (3804)	Took medically certified time off July 1994-June1995	5.9% (0.00)
Volslot (3082)	Took self or uncertified time off July1995-June 1996	48.8% (0.01)	Volold (3804)	Took self or uncertified time off July1994-June 1995	49.8% (0.01)
Attslot (3082)	Took any single days off July1995-June 1996	27.9% (0.01)	Attold (3806)	Took any single days off July1994-June 1995	26.5% (0.01)
Countatt (5055)	Number of attitudinal absences July 1995-June 1996	2(3)	Cattold (5055)	Number of attitudinal absences July 1994-June 1995	2(3)
Volnewsk (5055)	Total voluntary days off July1995-June 1996	9 days (14 days)	Vololdsk (2118)	Total voluntary days off July1994-June 1995	11 days (14 days)
Volnewob (5055)	Number of voluntary spells July 1995-June1996	3(5)	Vololdob (5055)	Number of voluntary spells July 1994-June1995	4(4)
Invnewsk (5055)	Total involuntary days off July1995-June 1996	4 days (13 days)	Involdsk (5055)	Total involuntary days off July1994-June 1995	5 days (13 days)
Invnewob (5055)	Number of involuntary spells July 1995-June1996	0.3(0.7)	Involdob (5055)	Number of involuntary spells July 1994-June1995	0.5(1)

NB: Standard errors must be calculated as confidence intervals for dummy variables

Table 4. Correlation Matrix For Absenteeism Variables

Variable	Offslot	Volslot	Invoslot	Offold	Volold	Involold	Attslot	Attold	Volnewo	Volnewsk	Vololdob
Offslot											
Volslot	0.911***										
Invoslot	0.206***	-0.215***									
Offold	-0.834***	-0.755***	-0.201***								
Volold	-0.754***	-0.683***	-0.182***	0.889***							
Involold	-0.214***	-0.193***	-0.052**	0.223***	-0.249***						
Attslot	0.581***	0.623***	-0.103***	-0.491***	-0.444***	-0.126***					
Attold	-0.572***	-0.477***	-0.127***	0.536***	0.577***	-0.095***	-0.310***				
Volnewob	0.302***	0.314***	-0.029	-0.317***	-0.270***	-0.097***	0.194***	-0.127***			
volnewsk	0.241***	0.250***	-0.022	-0.266***	-0.224***	0.085***	0.034*	-0.112***	0.888***		
Vololdob	-0.304***	-0.293***	-0.024	0.347***	0.359***	-0.031*	-0.218***	0.199***	0.138***	0.017***	
Vololdsk	-0.247***	-0.246***	-0.002	0.339***	0.344***	-0.116	-0.196***	0.135**	0.024*	0.065***	0.836***

*** indicates significance at the 1% level of confidence, ** at the 5% level, * at the 10% level.

Table 5. Sample Means & Summary Statistics

Variable		Variable	
Gender	90.1% male	Wage rate May 1994 - trainee	£3.00 per hour
Distance from home to work (miles)	4.44(3.74)	Wage rate May 1994 – unskilled	£3.34
Marital status - single	53.9%	Wage rate May 1994 – semi-skilled	£4.22
Marital status – married	42.5%	Wage rate May 1994 – skilled	£4.67
Marital status – other (divorced, separated, widowed)	3.6%	Wage rate May 1994 – team leader	£5.11
Ethnic status – afro-Caribbean	57.1%	Wage rate May 1994 – engineer	£6.56
Ethnic status – Asian	40.5%	Wage rate May 1995 – trainee	£3.16 per hour
Ethnic status – white & other	2.4%	Wage rate May 1995 – unskilled	£3.52
Tenure (days)	494 (532)	Wage rate May 1995 – semi-skilled	£4.32
Age (years)	32 (7.7)	Wage rate May 1995-skilled	£4.78
Promoted 1/7/95-30/6/96	9.8%	Wage rate May 1995 – team leader	£5.23
Grade – trainee	15.4%	Wage rate May 1995 – engineer	£6.72
Grade – unskilled	66.9%	Wage rate May 1996 - trainee	£3.19 per hour
Grade – semi-skilled	11%	Wage rate May 1996 – unskilled	£3.75
Grade – high (skilled, team leaders, engineers)	6.2%	Wage rate May 1996 – semi-skilled	£4.45
Night shifts	54%	Wage rate May 1996 – skilled	£4.92
Day shifts	44%	Wage rate May 1996 – team leader	£5.39
Other shifts	2%	Wage rate May 1996 – engineer	£6.92
Local unemployment rate	10% (0.60)	Bun Factory employment	311 (28)

Figures in parentheses are standard errors.

Table 6. Marginal Coefficients For Probit Estimates Of The Probability Of Time Off July 1995 – June 1996

Model	Any time off	Attitudinal absence	Voluntary absences only
Variable	Coefficient (sd)	Coefficient (sd)	Coefficient (sd)
Afro-Caribbean	-0.031 (0.024)	0.015 (0.022)	-0.018 (0.025)
White or other ethnic group	-0.178** (0.078)	-0.126* (0.057)	-0.228*** (0.072)
Married	-0.021 (0.024)	-0.046** (0.021)	-0.032 (0.024)
Other marital status – divorced, widowed or not stated.	0.107** (0.052)	-0.016 (0.048)	0.096* (0.055)
Women	-0.012 (0.034)	-0.028 (0.030)	-0.018 (0.034)
Trainee	0.065 (0.040)	-0.015 (0.037)	0.059 (0.042)
Unskilled	0.112*** (0.032)	0.031 (0.028)	0.099*** (0.032)
High Skilled – skilled, line leaders, or engineers.	-0.012 (0.053)	-0.024 (0.047)	0.036 (0.054)
Aged < 26 years	-0.038 (0.037)	-0.044 (0.031)	-0.030 (0.037)
Aged 26-35 years	0.036 (0.028)	0.015 (0.025)	0.040 (0.028)
Aged 46 years and older	0.060 (0.043)	0.060 (0.043)	0.066 (0.045)
Promoted this year	0.354*** (0.019)	0.236*** (0.027)	0.347*** (0.022)
Lives less than 2 miles away	-0.034 (0.025)	0.008 (0.022)	-0.027 (0.025)
Lives more than 5 miles away	-0.019 (0.026)	-0.017 (0.023)	-0.011 (0.026)
Tenure	-0.019×10^{-2}*** $(0.003) \times 10^{-2}$	-0.012×10^{-2}*** $(0.003) \times 10^{-2}$	-0.024×10^{-2}*** $(0.003) \times 10^{-2}$
Night shifts	0.023 (0.022)	-0.021 (0.019)	0.027 (0.022)
Other shifts – afternoons, mornings or rotating	-0.151** (0.072)	-0.084 (0.055)	-0.158** (0.070)
No of obs	2780	2780	2780
Log likelihood	-1730.4181	-1580.9828	-1736.6012
Pseudo R^2	9.4%	5.3%	9.9%
Predicted probability	0.570	0.278	0.517

The table presents robust marginal coefficients from a probit estimation. *** indicates significance at the 1% level of confidence, ** at the 5% level, * at the 10% level.

The default category is semi-skilled ethnically Asian men, who are single, aged 36-45 years, living 2-5 miles from the plant and working days.

Table 7. Benchmark Effects For Estimates Of Probability Of Taking Voluntary Time Off Between July 1995 And June 1996

Benchmark type	Benchmark type	Benchmark type	Benchmark type	Benchmark type	Benchmark type	Benchmark type	Benchmark type	Benchmark type	Benchmark type
Character-istics	Male Aged 36-45 Semi-skilled Living 2-5 miles away Day shifts Single Asian origin Mean tenure (494 days)	**Female** Aged 36-45 Semi-skilled Living 2-5 miles away Day shifts Single Asian origin Mean tenure (494 days)	**Female Aged 45+** Semi-skilled Living 2-5 miles away Day shifts Single Asian origin Mean tenure (494 days)	**Female Aged 45+** Semi-skilled Living 2-5 miles away Day shifts Single **Afro-caribbean origin** Mean tenure (494 days)	**Female Aged 45+** Semi-skilled Living 2-5 miles away Day shifts **Married Afro-caribbean origin** Mean tenure (494 days)	**Female Aged 45+ Unskilled** Living 2-5 miles away Day shifts **Married Afro-caribbean origin** Mean tenure (494 days)	**Female Aged 45+ Unskilled** Living 2-5 miles away **Night shifts Married Afro-caribbean origin** Mean tenure (494 days)	**Female Aged 45+ Unskilled Living <=2 miles away Night shifts Married Afro-caribbean origin** Mean tenure (494 days)	**Female Aged 45+ Unskilled Living <=2 miles away Night shifts Married Afro-caribbean origin Tenure of (794 days)**
Predicted probability of being off using all changes	0.517	0.498	0.564	0.546	0.514	0.612	0.639	0.613	0.541
Predicted probability of being off using only significant coefficients	0.517	0.517	0.517	0.517	0.517	0.616	0.616	0.616	0.544

This table starts with benchmark individual from previous regressions, and changes characteristics until person becomes an unskilled married female worker, aged 45 plus, of afro-caribbean origin, living close to the plant and working nights. The coefficients used are from table 6.

Table 8. OLS Estimates Of Voluntary Absences: Total Days, Spells And One-Day Periods Between July 1995 – June 1996

Model	Total days off	Spells off	Number of attitudinal absences
Variables	Coefficient (sd)	Coefficient (sd)	Coefficient (sd)
Afro-Caribbean	1.891*** (0.510)	0.888*** (0.165)	0.643*** (0.102)
White or other ethnic group	-3.629*** (0.781)	-1.145*** (0.230)	-0.379* (0.203)
Married	1.554*** (0.509)	0.130 (0.153)	-0.158* (0.091)
Other marital status – divorced, widowed or not stated.	12.282*** (2.088)	5.009*** (0.823)	2.307*** (0.442)
Women	-4.296*** (0.755)	-1.960*** (0.235)	-1.013*** (0.145)
Trainee	-3.773*** (0.764)	-1.343*** (0.263)	-0.643*** (0.160)
Unskilled	1.943*** (0.644)	0.427* (0.227)	0.248* (0.137)
High Skilled – skilled, line leaders, or engineers.	-5.076*** (0.762)	-1.716*** (0.297)	-1.060*** (0.178)
Aged < 26 years	0.523 (0.709)	-0.294 (0.226)	-0.247* (0.134)
Aged 26-35 years	0.986* (0.589)	-0.008 (0.197)	-0.012 (0.113)
Aged 46 years and older	-1.056 (1.111)	-0.758** (0.364)	-0.211 (0.227)
Promoted this year	4.026*** (0.546)	2.153*** (0.164)	1.655*** (0.115)
Lives less than 2 miles away	-0.708 (0.542)	0.561*** (0.181)	0.590*** (0.106)
Lives more than 5 miles away	-1.396** (0.542)	-0.243 (0.157)	-0.109 (0.097)
Tenure	0.038×10^{-1}*** $(0.005) \times 10^{-1}$	0.019×10^{-1}*** 0.002×10^{-1}	-0.012×10^{-1}*** $(0.001) \times 10^{-2}$
Night shifts	3.138*** (0.471)	1.017*** (0.152)	0.482*** (0.091)
Other shifts – afternoons, mornings or rotating	-4.177*** (0.667)	-1.150*** (0.268)	-0.477*** (0.183)
No of obs	4217	4217	4217
Constant	4.527*** (1.082)	1.619*** (0.357)	0.704*** (0.215)
R^2	8.56%	13.32%	13.27%

The table presents robust coefficients from an OLS estimation. *** indicates significance at the 1% level of confidence, ** at the 5% level, * at the 10% level.

The default category is semi-skilled ethnically Asian men, who are single, aged 36-45 years, living 2-5 miles from the plant and working the day shift.

Table 9. Marginal Probit Coefficients Indicating The Pressures On Absenteeism: Size Of Plant, Local Unemployment And Previous Year's Absenteeism

Pressures	Version 1	Version 2	Version 3	Version 4	Version 5	Version 6	Version 7	Version 8	Version 9
Previous month's plant employment	0.055*** (0.007)	-0.026 (0.030)	-0.085** (0.038)	–	–	–	–	–	–
This month's plant employment	–	–	–	0.091*** (0.008)	0.045*** (0.006)	0.020 (0.018)	–	–	–
Next month's plant employment	–	–	–	–	–	–	0.132*** (0.018)	0.071*** (0.007)	0.064*** (0.006)
Last month's local unemployment rate	0.614*** (0.206)	–	–	1.710*** (0.202)	–	–	2.575*** (0.525)	–	–
This month's local unemployment rate	–	-1.921* (1.002)	–	–	0.539*** (0.166)	–	–	1.248*** (0.191)	–
Next month's local unemployment rate	–	–	-4.024*** (1.242)	–	–	-0.412 (0.581)	–	–	1.099*** (0.179)
Interaction term	-0.006*** (0.001)	0.003 (0.003)	0.009** (0.004)	-0.010*** (0.001)	-0.005*** (0.176)	-0.002 (0.002)	-0.013*** (0.002)	-0.008*** (0.001)	-0.007*** (0.001)
Total voluntary days off last year	-0.008*** (0.001)	-0.009*** (0.001)	-0.009*** (0.001)	-0.008*** (0.001)	-0.008*** (0.001)	-0.009*** (0.001)	-0.009*** (0.001)	-0.009*** (0.001)	-0.007*** (0.001)
Diagnostics									
Number of observations	2629	2629	2629	2654	2654	2654	2602	2602	2602
Log likelihood	-933.1299	-1081.0193	-1056.7855	-928.6131	-1061.3532	-1062.0943	-885.497	-991.4804	-964.8335
Pseudo R^2	48.56%	40.41%	41.75%	49.35%	42.11	42.07	50.79%	44.89%	46.38%
Predicted probability	0.527	0.504	0.465	0.510	0.530	0.515	0.457	0.518	0.530

This table examines the relationships between different measures of internal and external pressures and the probability of absence.

Unemployment information is from the National Office of Statistics, and refers to the North London travel-to-work area. Unemployment and plant employment data refer to the month in which the absence occurs. The table shows robust, marginal coefficients from a probit regression. Full results, with coefficients for other variables, appear in appendix B6. Probit coefficients are shown in appendix B7. *** indicates significance at the 1% level of confidence, ** at the 5% level, * at the 10% level.

Table 10. Satisfaction Levels

Job content variables	Mean (standard deviation)	Job context variables	Mean (standard deviation)
I find the job challenging.	2.51(1.15)	The hours suit me.	3.25(1.38)
I feel like I could stay in the job forever.	3.20(1.37)	I get along well with my supervisor.	2.00(1.22)
My promotion prospects are good.	3.23(1.21)	I get on well with the other workers.	1.73(0.87)
I am interested in this type of business.	2.67(1.36)	This company is a good employer.	2.77(1.34)
When I get home from this job I am tired.	2.40(1.44)	Getting to work is not a problem.	2.54(1.57)
Content and context variables			
The pay is good.	3.77(1.24)	All in all, I am satisfied with the job.	2.92(1.30)

The questionnaire put a range of statements to the employees, and asked them to respond on a scale of 1-5, with 1 indicating strong agreement and 5 strong disagreement. Therefore a high score indicates a negative feeling about a particular facet of the job.

Table 11. Correlations Between Satisfaction And Absenteeism Variables

Facet of satisfaction	Probability of voluntary absence	Total number of days off	Total number of days off last year
Job content			
I feel like I could stay in the job forever.	-0.015	-0.375***	-0.241***
I find the job challenging.	0.081	0.231***	0.098
I am interested in this type of business.	-0.073	-0.185***	-0.114
My promotion prospects are good.	0.135*	0.001	-0.170**
When I get home from this job I am tired.	0.157**	0.070	-0.278***
Job context			
I get along well with my supervisor.	-0.095	-0.016	-0.056
Getting to work is not a problem.	0.048	-0.326***	-0.170**
The hours suit me.	0.028	-0.019	0.095
I get on well with the other workers.	-0.130*	0.176**	0.128*
This company is a good employer.	0.050	-0.390***	-0.198***
Job content and context variables			
The pay is good.	0.022	0.036	0.085
All in all, I am satisfied with the job.	0.089	-0.065	-0.141**

Respondents are asked to show their agreement with these statements on a scale of 1, for agree strongly, to 5, for disagree strongly. The time period for all absence variables is 1st July 1995 until 30th June 1996. Satisfaction questionnaires were returned during Autumn 1996.

*** indicates significance at the 1% level of confidence, ** at the 5% level, * at the 10% level.

Appendix B9 reports correlation coefficients for all absenteeism variables.

Table 12. Changes Affecting Workers At The Food Manufacturing Plant

Groups affected	April 1995	May 1995	November 1995	May 1996
All workers	Basic food hygiene training introduced Plant stability guaranteed by company rationalisation	Pay rises	Change of culture, embracing team briefings New canteen with 24 vending facilities	Sick pay introduced Annual leave accrued from start date Annual leave increased from 15 to 17 days Pay rises
Specific groups of workers				
Trainees		5.3% pay rise		1% pay rise
Unskilled		5.4%		6.5%
Semi-skilled		2.4%		3%
Skilled		2.4%		2.9%
Line leaders	training initiated	2.3%		3.1%
Engineers		2.4%		3%

Skilled employees, line leaders and engineers are combined in to a highly skilled grade, this ensures the cell size is big enough to avoid problems in estimation.

Table 13a. Difference In Difference Equation For March To May 1995

March – May 1995	Trainees	Unskilled	Semi-skilled	High skilled
Time dummy	-0.060*** (0.012)	0.001 (0.016)	-0.062*** (0.015)	-0.061*** (0.015)
Grade	-0.069*** (0.011)	0.077*** (0.016)	-0.068*** (0.015)	-0.058*** (0.016)
Interaction	0.560 (0.355)	-0.078*** (0.023)	0.052*** (0.017)	0.042** (0.018)
Constant	0.069*** (0.011)	0.014** (0.006)	0.077*** (0.013)	0.077*** (0.013)
No of obs	466	466	466	466
R^2	13.59%	13.75%	13.87%	13.89%

These tables look at the difference in absenteeism rates by grade following significant changes to pay and conditions. Generated using voluntary absences: see appendix B10 for tables using all absences. *** indicates significance at the 1% level of confidence, ** at the 5% level, * at the 10% level.

Table 13b. Difference In Difference Equation For April To June 1995

April – June 1995	Trainees	Unskilled	Semi-skilled	High skilled
Time dummy	-0.042*** (0.016)	-0.040 (0.025)	-0.049*** (0.018)	-0.047** (0.018)
Grade	0.261 (0.274)	0.037 (0.029)	-0.052 (0.034)	-0.038 (0.032)
Interaction	-0.292 (0.274)	-0.007 (0.032)	0.028 (0.036)	0.013 (0.035)
Constant	0.073*** (0.013)	0.049** (0.024)	0.082*** (0.015)	0.081*** (0.015)
No of obs	522	522	522	522
R^2	18.32%	18.36%	18.38%	18.39%

See notes for table 13a.

Table 13c. Difference In Difference Equation For October To December 1995

October – December 1995	Trainees	Unskilled	Semi-skilled	High skilled
Time dummy	0.001 (0.013)	-0.017** (0.015)	0.004 (0.016)	0.001 (0.015)
Grade	0.152 (0.103)	0.028 (0.018)	-0.031* (0.017)	-0.036** (0.014)
Interaction of grade & time	-0.047 (0.121)	0.028 (0.025)	-0.029 (0.021)	-0.010 (0.021)
Constant	0.045*** (0.008)	0.035*** (0.013)	0.056*** (0.010)	0.057*** (0.010)
No of obs	538	538	538	538
R^2	15.49%	15.55%	15.61%	15.64%

See notes for table 13a.

Table 13d. Difference In Difference Equation For April To June 1996

April – June 1996	Trainees	Unskilled	Semi-skilled	High skilled
Time dummy	-0.006 (0.009)	-0.002 (0.012)	-0.001 (0.011)	0.002 (0.010)
Grade	-0.019*** (0.006)	0.012 (0.011)	-0.016** (0.008)	0.009 (0.025)
Interaction	0.042 (0.036)	-0.000 (0.018)	-0.003 (0.012)	-0.027 (0.027)
Constant	0.019** (0.006)	0.010 (0.009)	0.020*** (0.007)	0.016** (0.005)
No of obs	562	562	562	562
R^2	10.70%	10.70%	10.70%	10.70%

See notes for table 13a.

Table 14. Correlations Between Measures Of Absenteeism And Labour Turnover

Absenteeism variable July 1995-June1996	Labour turnover (1/7/95-30/6/96)	Voluntary labour turnover 1/7/95-30/6/96)	Absenteeism variable July1994-June1995	Labour turnover (1/7/95-30/6/96)	Voluntary labour turnover 1/7/95-30/6/96)
Voluntary time off "volslot"	0.004	-0.082***	Voluntary time off "volold"	-0.121***	-0.032
Voluntary total days off "volnewsk"	0.452***	0.122***	Voluntary total days off "vololdsk"	0.015	0.015

*** indicates significance at the 1% level of confidence, ** at the 5% level, * at the 10% level.
Voluntary labour turnover defined as termination not due to misconduct, sackings, end of temporary or seasonal contracts, redundancy, retirement, bad time keeping, ill health or a transfer to staff.

A more extensive analysis of correlations between absenteeism and labour turnover is reported in appendix B11.

Table 15. Marginal Coefficients From Probit Estimates Of The Probability Of Leaving July 1995 – June 1996

Model	Turnover (1)	Voluntary turnover (2)	Voluntary turnover (1)
Variable	Coefficient (sd)	Coefficient (sd)	Coefficient (sd)
Afro-Caribbean	-0.038 (0.026)	-0.080*** (0.021)	-0.093*** (0.021)
White or other ethnic group	0.174* (0.086)	-0.178*** (0.024)	-0.199*** (0.015)
Married	0.089*** (0.025)	0.106*** (0.020)	0.108*** (0.020)
Other marital status – divorced, widowed or not stated.	0.017 (0.058)	Dropped	Dropped
Women	0.014 (0.038)	0.015 (0.031)	0.025 (0.032)
Trainee	0.172*** (0.042)	0.070* (0.042)	0.077* (0.042)
Unskilled	0.233*** (0.033)	0.070** (0.026)	0.055** (0.026)
High Skilled – skilled, line leaders, or engineers.	0.107* (0.060)	-0.146*** (0.033)	-0.140*** (0.034)
Aged < 26 years	-0.061 (0.037)	0.024 (0.033)	0.015 (0.033)
Aged 26-35 years	0.001×10^{-1} $(0.299) \times 10^{-1}$	0.078*** (0.025)	0.081*** (0.025)
Aged 46 years and older	0.044 (0.055)	0.035 (0.050)	0.056 (0.052)
Promoted this year	-0.326*** (0.025)	-0.179*** (0.017)	-0.158*** (0.018)
Lives less than 2 miles away	-0.008 (0.026)	-0.077*** (0.019)	-0.079*** (0.019)
Lives more than 5 miles away	0.017 (0.027)	0.034 (0.022)	0.033 (0.022)
Tenure	-0.061×10^{-2}*** $(0.005) \times 10^{-2}$	-0.037×10^{-2}*** $(0.004) \times 10^{-2}$	-0.038×10^{-2}*** $(0.004) \times 10^{-2}$
Night shifts	-0.040* (0.022)	-0.083*** (0.018)	-0.104*** (0.019)
Other shifts – afternoons, mornings or rotating	-0.075 (0.092)	0.001 (0.068)	0.004 (0.066)
Next month's plant employment	N/a	-0.008 (0.007)	-0.004 (0.007)
Last month's local unemployment rate	N/a	-0.017 (0.196)	0.093 (0.197)
Interaction term	N/a	0.009×10^{-1} $(0.007) \times 10^{-1}$	0.004×10^{-1} $(0.007) \times 10^{-1}$
Lagged total voluntary days off	N/a	N/a	0.004*** (0.001)
No of obs	2788	2485	2485
Log likelihood	-1572.3404	-1185.0843	-1173.0877
Pseudo R^2	18.61%	16.28%	17.13
Predicted probability	0.489	0.207	0.205

The table presents robust marginal coefficients from a probit estimation. *** indicates significance at the 1% level of confidence, ** at the 5% level, * at the 10% level.

The default category is semi-skilled ethnically Asian men, who are single, aged 36-45 years, living 2-5 miles from the plant, and working days.

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Table 16. Benchmark Effects For Estimates Of Probability Of Voluntary Quits

Benchmark type	Benchmark type	Benchmark type	Benchmark type	Benchmark type	Benchmark type	Benchmark type	Benchmark type	Benchmark type	Benchmark type
Charact-eristics	Male Aged 36-45 Semi-skilled Living 2-5 miles away Day shifts Single Asian origin Mean tenure (494 days)	**Female Aged 36-45** Semi-skilled Living 2-5 miles away Day shifts Single Asian origin Mean tenure (494 days)	**Female Aged 45+** Semi-skilled Living 2-5 miles away Day shifts Single Asian origin Mean tenure (494 days)	**Female Aged 45+** Semi-skilled Living 2-5 miles away Day shifts Single **Afro-caribbean origin** Mean tenure (494 days)	**Female Aged 45+** Semi-skilled Living 2-5 miles away Day shifts **Married Afro-caribbean origin** Mean tenure (494 days)	**Female Aged 45+ Unskilled** Living 2-5 miles away Day shifts **Married Afro-caribbean origin** Mean tenure (494 days)	**Female Aged 45+ Unskilled** Living 2-5 miles away **Night shifts Married Afro-caribbean origin** Mean tenure (494 days)	**Female Aged 45+ Unskilled Living <=2 miles away Night shifts Married Afro-caribbean origin** Mean tenure (494 days)	**Female Aged 45+ Unskilled Living <=2 miles away Night shifts Married Afro-caribbean origin Tenure (794 days)**
Predicted probability of being off using only significant coefficients	0.207	0.207	0.207	0.127	0.233	0.303	0.220	0.143	0.032

This table starts with a benchmark individual from previous regressions, and changes characteristics until person becomes an unskilled married female worker, aged 45 plus, of afro-caribbean origin, living close to the plant and working nights. The coefficients used are those reported in column 2 of table 15.

Chapter 4: Voice and Workplace Change

1. Introduction

British industrial relations has been subject to a range of strong pressures over the last twenty five years. Whilst during the 1980s there was debate between proponents of the idea that things had changed radically (Bassett: 1986), and others argued that change should not be overstated (MacInnes: 1987), by the end of the 1990s Gallie et al pronounced that industrial relations had undergone a "transformation" (1998: p1). This change was driven by increased global competition (Beatson: 1995a), government legislation (Freeman and Pelletier: 1990), technical advances (Gallie et al: 1998) and the development of human resource management. The degree of change can be measured in terms of altered workplace institutions, or the relative power of the two major parties: employers and workers. Trade unions are obviously central to a discussion of industrial relations. Trade unions have been affected by a range of secular influences, and cyclical pressures, which have reduced their influence and changed workplace industrial relations across much of the developed world. The 1998 Workplace Employee Relations Survey revealed that the proportion of British establishments employing union members had dropped from 73 per cent in 1980 to 54 per cent. Whilst some firms established non-union councils to fill the representation gap (Terry: 1999), a sizeable proportion of employees have no access to a form of collective voice.

Power is a contested concept (Lukes: 1974, Kirkbride: 1992) but it is relevant to our consideration of employee influence over workplace change. Lukes (1974) devised a three dimensional model of power which underpins the analysis of this chapter. The one-dimensional view defines power as the ability of parties to "win" issues and influence decisions. The two dimensional definition states that power does not merely relate to who wins an issue but dictates which issues are deemed suitable for negotiation, thereby reducing the opportunities for employees and trade unions to exercise voice. If management control the agenda, it is harder for unions to legitimise dissent and hence mobilise their members, which is vital if they are to utilise their collective power (Tilly: 1978, Kelly: 1997). In an age of union decline, the majority of employees have non-union representation or no representation at all. Mobilisation of these employees will be extremely difficult. The

three dimensional view of power articulated by Lukes (1974) recognises that one party may have the ability to manipulate the other through ideological control. Whilst employers may historically have desired the ability to wield ideological control, their ability to introduce this may have been impaired by the counterbalancing power of trade unions. A move towards a more unitarist environment may enable management to bypass trade union voice for more direct communication forms, or to withdraw formalised voice. An analysis of Lukes' third dimension of power is left for future work. In Lukes' model, dimensions are not sequential, they do not need to be pursued in a certain order; but power as indicated by the second dimension is greater than that of the first dimension.

In this chapter we argue that the pressures on organisations led to an increase in workplace change over the period 1979 to 2000. Any fall in the ability of employees to influence decision about workplace change implies a reduction in power. We use the ability to influence the introduction of workplace change as a proxy for Lukes' second dimension of power, so we argue that the ability of management to introduce change without discussing it during the annual settlement reflects a change in the "terrain of bargaining" (Terry: 1989 p 110) and a reduction in employee influence. Changes to working practices are associated with effort intensification (Bennett and Smith-Gavine: 1988). An inability to get compensatory remuneration for workplace change is an irrefutable fall in employee power as represented by Lukes' first dimension. Our hypotheses are that there will be fairly consistent levels of workplace change, in view of the pressures on organisations to maximise performance and that change will be compensated for with greater than average increases in remuneration. However, the ability to link change to the annual settlement and gain the associated remuneration will be greatest where union recognition remains.

This chapter focuses on changes to working practices introduced as part of the annual pay round, and on the ability of employees to extract a wage increase or improvement in their conditions of employment at the time change is introduced using the CBI Pay Databank Survey for the period 1979-2000. The Workplace Industrial Relations Surveys (WIRS) are used to look at the context of change and the ability of collectively organised employees to exercise voice over such issues across the wider economy. Between 1980 and

1998 managerial respondents gave information about the range of issues they negotiated over with trade union representatives. This information is discussed in section 2. Section 3 looks at the literature on workplace change, and develops some hypotheses for testing. The data and methodological issues arising from the CBI dataset are addressed in section 4. The next section looks at the pattern and determinants of workplace change, before examining whether improved remuneration and conditions of employment are correlated with workplace change, section 5. Section 6 offers conclusions on the pattern and consequences of changes to working practices.

2. The Context For Negotiated Change: Workplace Industrial Relations Surveys

This chapter charts the introduction of workplace change, and examines whether change is accompanied by compensatory remuneration. We can set the context for this by examining the pattern of negotiation over various workplace changes using the range of Workplace Industrial Relations Surveys (WIRS). In 1980, 1984, 1990 and 1998 managerial respondents were asked to indicate whether they negotiated over issues such as staffing, working conditions, recruitment and capital investment with trade union representatives. Whilst our CBI sample is not restricted to sites which engage in trade union bargaining, this information is still relevant. Trade unions are likely to exert greater influence over workplace change than non-union company councils (Terry: 1999), and even more than unrepresented employees. The proportion of managerial respondents indicating that union representatives had a meaningful voice in such changes are shown in Table 1.

It is clear that the right to negotiate has fallen over time. Comparison is made less than straightforward by changes to the questions over time, yet this indicates that union influence was perceived to have fallen by the surveyors. Between 1980 and 1990 the picture of influence is varied. More respondents claimed to negotiate over the length of the working week, physical conditions, redeployment, redundancy and staffing levels in 1990 than in the earlier study. Figures on capital investment and recruitment were roughly constant, whilst negotiation over changes to boost productivity fell by around one third. On most issues the responses are very similar for manual and non-manual workers. Between

1990 and 1998 however, things change quite severely. Respondents claimed to negotiate over physical conditions, recruitment and staffing levels in very few cases. Pensions were widely negotiated over, but as part of an overall dialogue about remuneration. This survey no longer covered capital investment decisions or redeployment by 1998. The fact that the question changed, with options for agreement becoming less strategic by 1998, may indicate a fall in the coverage of voice. This is important because as Brown et al (2000) argue, examining the shift from employee rights negotiated through collective bargaining to those enshrined in legislation, "collective procedures are the custodians of individual rights" (2000: 627). Without a collective agreement on issues such as staffing, redeployment and working conditions, individual employees may be faced with regular demands for change and have no ability to influence the introduction of change to obtain compensatory remuneration.

It is possible to extend the period covered by WIRS backwards, to the 1960s. Brown et al (2000) report information from an earlier survey, that of the 1968 Royal Commission, which can be used to allow analysis from the mid 1960s, albeit for a smaller sample of the economy. The 1966 Royal Commission Survey, used a sample of 319 managerial respondents, across manufacturing sites of 150 employees and construction sites of 50 staff or more, making the survey much less representative than the later WIRS series. Using those questions which are strictly comparable with those in Table 1: redeployment was subject to agreement in 62 per cent of cases; new jobs and new machines in more than 60 per cent of cases: and the manning of machines in 47 per cent. Compared with the information presented in Table 1, these indicate a stronger influence on specific issues than in 1980, although as the range of issues is narrower than covered by the 1980's WIRS it is not clear if the overall sphere of influence was greater or not. Respondents were asked to indicate if they discussed and settled these issues with shop stewards – where they were present, which again makes the results slightly different those from WIRS. This extension of the period is important though, as it allows us to consider the 1990s as a time of particularly low levels of union influence, rather than to see the 1980s as a time of particularly strong union influence.

An earlier paper by Brown et al (1998: iii) identified the phenomenon of "partial derecognition", whereby trade unions see the range of issues over which they have negotiation rights shrink. Overall, the picture from WIRS is one of a reduced sphere of influence, of this "partial derecognition" where union representatives remain, particularly since 1990. It is likely that non-union company councils and unrepresented workers will have even less influence over change.

3. Themes & Hypotheses

a) Patterns of Workplace Change

According to Lukes' (1974) model, the ability to negotiate over or influence the introduction of change corresponds to power as measured by his second dimension. Over the 1980s competitive pressures increased, and so we anticipate an increasing proportion of settlements will include consideration of workplace change. If the proportion of settlements covering workplace change has risen we can assume that employees have lost little or none of their power to influence the contents of the annual settlement. If our literature suggest that plenty of workplace change is occurring but the data show that employees no longer discuss this with their employer, this will indicate a fall in employee power. We look first for evidence of the amount of workplace change over this period and specific pressures leading to more change, before looking at the type of workers and industries most likely to be affected.

Between 1979 and 2000 there was a great deal of structural change in industry (Gallie et al: 1998) and an intensification of economic competitiveness Beatson (1995a). Evidence on whether there was an increase in the rate of workplace change though is mixed. Pollert (1991) cautions that to see 1979 as a watershed in terms of flexibility ignores the tradition of continual change in industrial relations, and Bosworth (1983) too stresses that technical change was common in the UK throughout the post-1945 period. However, Beatson (1995a) claims that there has been a significant increase in measures to boost flexible working arrangements since the end of the 1970s. Beatson (1995b) argues that the rise in

UK workplace change reflects a response to the increase in international competitiveness, new production processes, changes in the supply and demand for labour, and changes in government policies. Marsden and Thompson (1990), using secondary qualitative sources and some interviews, examine the rise in flexibility improving deals in the early 1980s. Efforts to boost productivity saw two periods of intense change: 1980 to 1982; and 1984 to 1987. WIRS data illustrates the continuing pattern of workplace change in the UK over recent years: 65 per cent of managerial respondents employing 25 or more staff in 1998 claimed their establishment had undergone a lot of change over the last five years. However, between 1979 and 1990 Dunn and Wright (1994) found little evidence of formal change on brownfield sites. This suggests that change may be occurring informally, outside annual settlements, which will impact on our ability to capture all incidences of change with the CBI dataset.

Elger (1991) argues that employers behave pragmatically, using secular and cyclical pressures to instigate workplace changes. The recession of the early 1980s and the government's attitude towards organised labour made it relatively easy to engineer piecemeal change, which is likely to arouse more limited resistance than a fundamental change in working practices, and during the first half of the 1980's most flexibility measures were introduced at a time of crisis (Elger: 1991). Firms are unlikely to use an economic downturn as an excuse for radical change if they were not sure of imposing their wishes (Kelly: 1985, Batstone and Gourlay: 1986). Thus firms proceeded with the introduction of new working practices in much the same way as the government moved its anti-union legislative programme. Marsden and Thompson (1990) claimed that the introduction of change was smoother at the end rather than during the early 1980s because of the widespread recognition of intense and constant competition. The smoother introduction of change could reflect the fact that management exploited competitive pressures to justify change, or that employees recognised the need to constantly improve performance through new practices. Change has certainly been cyclically induced, but the continuing decline in union membership may have added a secular element to the pattern of change. Kelly (1990) argues that by all three of Lukes' (1974) definitions of power, union strength declined over the early and mid 1980s, and union density and recognition have

continued to fall since then. Viewing power struggles as zero sum engagements implies that this fall was accompanied by the strengthening of employers' hands which may lead to greater workplace change outside the annual settlement. In line with this idea, Brown et al (1998) introduce the concept of partial derecognition, referring to instances where recognised unions have seen the scope of their voice curtailed. Such a position represents a change in the terrain of bargaining (Terry:1989), and a decline in their bargaining power over a full range of issues may be accompanied by less influence over those issues which remain on the joint bargaining agenda. Whilst non-union representatives may be offered a chance to negotiate over change (Neathey and Arrowsmith: 2001), their role tends to be one of consultation rather than strong influence, and is diminished in tough economic climates (Terry: 1999).

Although it appears that workplace change has become more common over the period, there is likely to have had been uneven incidence across industries and types of employee. Whilst Batstone and Gourlay's (1986) study finds that two thirds of all shop stewards had been involved in the changing of working practices, this average varied from 80 per cent of shop stewards in chemicals to 44 per cent in finance. The pattern of industrial relations conflicts during the 1980s and 1990s also affected sectors unevenly, notably involving paper and publishing sector and transport and communications (Batstone and Gourlay: 1986). Beatson (1995a) suggests that increasingly competitive markets made measures to boost manufacturing efficiency crucial following the onset of the 1980s' recession likely; so change would have been concentrated in the manufacturing sector and/or in the industrialised North and Midlands in the earlier years of the sample. Marsden and Thompson (1990) find that most change related to demarcation and deployment, and was centred on manual workers in non-car engineering. These groups of workers often saw lots of changes to their working methods following a flexibility agreement. Batstone and Gourlay (1986) stressed that certain processes and groups of workers would be more likely to experience change than others, particularly manual workers. They claimed that finance and telecoms saw the greatest repeated use of technical change, whereas print, food and drink, engineering, and chemicals had generally only been affected once. The second recession of the period, during the early 1990s, had a more even geographical impact, so

service sector firms, in banking and insurance for instance, are likely to have introduced changes during the 1990s. Skill biased technical change is a pervasive phenomenon across most industrialised nations (Machin: 2001), and the associated fall in demand for unskilled workers over the last eighteen years, may have been mirrored by unskilled manual workers' disproportionate experience of workplace change.

Evidence for the other specific types of change on which this paper focuses, shift working, flexible hours and removal of restrictive practices, is hard to find. The abolition of restrictive practices is likely to be concentrated in particular areas, reflecting the demise of previously strong trade unions, as in printing. Daniel (1987) found that around 20 per cent of large unionised plants had seen steps taken to reduce "restrictive practices". Cross (1988) found that 13 per cent of his sample of 450 manufacturing groups saw increased use of more flexible working practices from 1979 onwards. The introduction of shift working is likely to be limited to certain process and industries, perhaps recently communications and banking. It is likely that all industries and workers will have been affected to some extent by the introduction of new technology, however, smaller firms may find it harder to introduce technical change due to capital constraints. A report by ACAS (1988), focussing on large, private manufacturing companies, finds that task flexibility was more likely to have been imposed in larger firms. The idea that there should be some compensatory trade off for workplace change is explored in the next section.

Hypotheses For Sub-Section a – Workplace Change

Given the pressures establishments were facing between 1979 and 2000, we expect a relatively high incidence of workplace change, with trade unions better able to maintain the right to negotiate over change as part of the annual settlement. If workplace change is cyclically driven the incidence is likely to be concentrated in the two periods corresponding to a weak economy, the early 1980s and early 1990s, and in regions with higher unemployment. We predict that it will have a greater effect upon manufacturing than services and manuals more than other employees. Lagged change, indicating a need for continued improvements in performance, is likely to be positively related to change.

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b) Intensification And Rewards For Change

According to Lukes' (1974) model, the first dimension of employee power can be proxied by wages rises. In particular where workplace change affects a group of employees we assume that their effort levels have increased. This group must obtain compensatory remuneration, as represented by a greater than average wage increase or better working hours or holidays, in order to retain the same wage-effort trade off.

Whilst workers may not resent efficiency increasing change per se there is a wealth of evidence that shows workplace change has "involved an uneven increase in the scope of management prerogatives and, often, an intensification of work" (Elger: 1991 p.49), see also Green (2001) and Brown et al (1998). Batstone and Gourlay (1986) revealed 60-80 per cent of manual manufacturing respondents believed their effort levels had increased and more than a half of all groups stated that their effort had increased to very high, or reasonably high levels. Effort rose fastest where there was repeated change. Gallie and White (1993) revealed that new technology was correlated with a higher level of required skill. In turn greater skill was linked to higher levels of effort so, whilst some analysts might view technical change as having a benign or even beneficial impact upon employee effort, the resulting rise in required skills leads to effort intensification. As a background to these findings, Bennett and Smith-Gavine (1988) devised a percentage utilisation of labour index. They revealed a ceiling-breaking rise in productivity, as represented by this index, between 1982 and 1984, indicating effort intensification because there was no accompanying rise in capital investment.

More formally if workers are subjected to change which increases the demands upon their effort then they would expect to see compensatory wage rises. Equation 1 highlights the wage-effort trade off which employers and workers enter into:

$$E_t = (\beta_1 X + \beta_2 W_t + e_t) \qquad \text{Equation 1}$$

Effort, E, is determined by a vector of characteristics, X, which we assume to be unchanging, the wage, W, with $\beta_2 > 0$ and an error term, e. Assuming that the employment relationship commences at time t, then in return for a given effort level, E_t, the worker expects to receive wage, W_t. The introduction of workplace change at time t+1 alters this relationship. If workers have retained a degree of power then we expect that in line with the extra effort represented by E_{t+1}, their wage will rise to W_{t+1}. The closer the elasticity to one the greater their power. So that

$$W_{t+1} = (d_1X + d_2E_{t+1} + u_{t+1})$$ **Equation 2**

With $d_2 > 0$

Workplace change may be resisted by employees, which could offer another justification for compensatory increases or shorter hours. Empirical evidence reveals that the pattern of worker resistance to changes in working practices varies widely, according to the type of change introduced and the skill group of the worker (Daniel: 1987, Batstone and Gourlay: 1986). New technology in particular is often viewed positively (Marsh: 1992, Marsden and Thompson: 1990), as it may enhance employees' status (Daniel: 1987). WIRS 3 indicates that manual stewards have greater influence in workplaces than non-manual union representatives, which may go some way to explaining why manual workers were less resistant to change than non-manuals.

As the evidence suggests workplace change increases the effort demands on workers, then their pay should rise in line with their effort. Siegrist (1998) uses medical data to illustrate the stress, and ill health, which results from an effort-reward imbalance. The forging of a link between workplace change and wage rises is not new, Daniel (1987) stressed the similarity between more recent flexibility deals and 1960s' productivity bargaining. Following the example of the Esso plant at Fawsey, productivity bargaining was advocated by the Donovan commission in the late 1960s (Martin: 1992). Whilst common in the 1960s and 1970s, such bargaining fell out of use when increases were constrained by incomes policies, as it was discredited as a means of breaking statutory pay limits (Marsden and Thompson: 1990). Evidence on the ability of workers to influence

change and benefit financially from it is mixed. Marsden and Thompson (1990) find that the introduction of workplace change was generally the result of an agreement offset by higher wages. However, Elger (1991) and Terry (1989) suggest that whilst bargaining over flexibility measures to some extent resembles bargaining over productivity, cyclical pressures resulting in the 'regaining of the managerial prerogative', favour managers and make bargaining more adversarial. A tight labour market might encourage firms to engage in a trade-off with their workers, in order to maintain morale and facilitate a smooth transition, whilst during recession employers may be better able to resist workers' claims. This is why a longitudinal study of this nature is so important.

It is recognised that unions have different degrees over influence over different workplace issues (Andrews and Simmons: 1995), which has led to the development of sequential bargaining models (Manning: 1987), a position supported by the WIRS data in table 1. Within sequential models, unions often find themselves in a reactive role regarding discussion of workplace change, wages are bargained over by both sides, and unions take no role in deciding employment levels, although employment levels are beyond the scrutiny of this paper. Frost (2001), focusing on the *process* of change in North American steel plants, finds an active local union involvement in change brings benefits to both employees and firms, but only where unions were involved from the initiation of consideration of change. Marsh (1992) argues that UK unions often have little role in negotiating workplace change, their place being to react once management have begun to plan the changes and to try and ensure that labour shares in the benefits (Price: 1988). However, Rose and Jones (1985) found substantial variation in the ability at plant level to resist management attempts to reorganise work and to bargain for non-pecuniary benefits in return for new technology and the introduction of other changes. Elger (1991) found that workers in the South East and chemicals were more likely to extract recompense for change, whilst Batstone and Gourlay (1986) found that print workers were most often compensated for change. This suggests that we are more likely to capture employee influence in the form of a link between change and remuneration than between change and the settlement.

Unions have traditionally bargained for improvements in non-wage remuneration, so the search for recompense for accepting change must be broader than an analysis of wage rises. For the US Kochan (1980) found that unions' success in achieving wage premia was matched by a superior non-wage package, and Green et al (1985) found evidence of similar achievements in the UK. In relation to hours, improvements were noted between 1945 and 1980, with little sign of a fall since then, but holiday improvements are visible over our period (Green: 2001). This success reflects the fact that "paid holidays have become an important part of the contested labour contract" (Green 1997, p.245). His analysis of the UK labour force survey finds holiday entitlement rose across the board during the 1980s, but that the union-nonunion gap increased, the holiday gap implying that non-union effort levels are higher, ceteris paribus. Whilst the introduction of the Working Time Directive in 1998 might be thought to influence hours and holiday arrangements in our sample, Neathey and Arrowsmith (2001) found that it has so far had a limited impact, particularly over holiday arrangements.

Hypotheses For Sub-Section b – Intensification And Rewards For Change

The outcome of bargaining over wages represents power, as represented by the first of Lukes' (1974) dimensions. The introduction of workplace change in the annual settlement will be accompanied by a compensatory wage increase, or improved hours and holidays unless there is as decline in employees' power. Voice, in the form of union recognition, will be crucial in making sure that the disruption and greater effort associated with change are rewarded.

c) Continued Employment

We predict that change will be accompanied by better than average pay increases, or improved hours and holidays, but organisational crisis may limit the outcomes of bargaining. If employers face the prospect of shutdown then it might seem sensible for workers to accept efficiency-boosting workplace change without extra financial remuneration or improved conditions, the "reward" to these workers being their continued employment. In the US Jacobson et al. (1993) use individual level data to highlight wage

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falls for individuals who were victims of mass lay-offs during the early and mid-1980s. Those who were "separated" earn 9 per cent less then their colleagues and these shortfalls were visible as early as three years before their termination. The duration of these pay inequalities suggests that the firm felt able to identify the least productive of its workforce and to reject seniority as a criterion for discharge when economic conditions dictated layoffs. It also implies that it may not be too difficult to identify plants where change is introduced without "rewards" in order to combat poor performance. Whilst nominal wage freezes are unusual and cuts rare within the UK (Brown et al: 2004, IDS: 1990, 1991a, 1991b, 1993) and notably in this dataset, it is possible that workers in endangered plants may receive a lower increase than employees within the same industry and region.

Lawrence and Lawrence (1985) argue that during the late 1960s and early 1970s real wages rose faster than they "should" have, given productivity and terms of trade changes. They suggested that in a declining industry labour acts to boost its share of income by taking some of that which would previously have accrued to capital. Capital is "held to ransom" because of its fixed and irreversible nature. By demanding higher than appropriate wage increases an industry-wide union acts to hasten the demise of plants in the industry concerned, and although workers' wages eventually fall, by this time the plant is doomed to close. This paper contradicts that of Jacobsen et al, suggesting as it does that it may be relatively difficult to establish a link between wage increases and plant closure, with poor performers only becoming visible at the last minute.

The only comparable work for the UK is that of Blanchflower (1991). He claimed to find that labour was willing to forego its share of rents in the face of a demand shock, with wages a declining function of the probability of firm closure. Using data from individuals' responses to British Social Attitude Surveys he suggested that workers who expect to be laid off get a lower wage, as do those who expect their plant to close. However, those expecting job cuts at their plants to leave them unaffected did not experience lower wages. Whilst these findings initially seem plausible, respondents report the probability of redundancy as constant over the cycle, indicating that they are not economically rational. Their responses may represent ex post rationalisation for their lay off. The lower wage

effect for plant closure is only significant for non-union labour, indicating the importance again of voice in determining rewards.

Hypotheses For Sub-Section c – Continued Employment

It is likely that firms facing crisis will want to introduce workplace change, with the exception of new technology which is costly (Elger: 1991). Multiple changes may be needed to save the organisation, so an association between crisis, as exemplified by an employment shock, and multiple change is predicted. This change is unlikely to be accompanied by improved wages or changes in hours and holidays even in the presence of a trade union.

4. Data

This paper uses the CBI Pay Settlement Data Bank, a sample of firms drawn originally from the 1978 Census of Production. This survey was introduced in 1979 as a systematic monitoring of private sector wage settlements, including both CBI member and non-members. The sample offers approximately 1500 observations each year, at the level of the settlement group within establishments, offering one of the longest continuous sources of disaggregated firm-level wage data available in Britain. The data cover around 1.5 million employees, around 8 per cent of the private sector labour force. One, two or three settlement groups for each establishment may be present in any one year, with the questionnaire requesting that where possible these be the two largest manual and the largest non-manual groups. The response rate to this survey is high, 65-70 per cent according to Gregory et al (1985), and care is taken to replace firms which exit with ones in the same industry and region. Although the survey now covers both manufacturing and services, unionised and non-union groups, service sector establishments were only included from 1987 onwards and the sample remains dominated by manufacturing companies. However, because service sector groups are typically larger they employ a disproportionate number of workers in the sample.

The data are arranged in pay years running from August till the following July, a phenomenon which indicates the tendency of firms to settle annual deals during the same month each year and reflect wider pay trends. Sample means for the entire period are presented in the first column of Table 2. The sample period encompasses two episodes of double-digit inflation, two recessions - one in a high inflation environment, the other associated with low inflation - and analysis suggests that the coefficients vary over time. In order to pursue discussion of whether workplace change and annual settlements are subject to cyclical pressures the overall 22 year period is divided into four unbalanced panels of five years. These correspond broadly to the economic downturns, 1979-1983 and 1991-1995, and the two upturns of 1987-1991 and 1996-2000.

In 1986 Batstone and Gourlay claimed that formal agreements at the pay bargaining level only covered a narrow range of other issues, because pay settlements were more centralised than agreements on conditions. However, Gregory et al (1986) analysed data from the CBI sample and found that the establishment level was the most common level for bargaining and decision making about pay and conditions by the early 1980s. The proportion of pay settlements dealt with at establishment level has increased due to the extent of decentralisation in industrial relations (WIRS: 1990). Thus this data set provides valuable insight into the processes and outcomes of plant-level bargaining. All groups in the data set have some element of site bargaining or decision making in the annual settlement.

The union identifier in the dataset is inconsistent over time so we use the variable "claim submitted" to identify which groups are in fact unionised. The overall rate of union recognition is over 80 per cent in the first years of the dataset reflecting the sample's manufacturing basis, falling to around 35 per cent in the last years of the sample, having followed the same pattern of decline over the last twenty years as in the wider economy. A problem arises in respect of the occupational grouping identifier. From 1998 this question is withdrawn, so the information has to be inferred from previous years. This creates a problem with groups who enter in 1998, 1999 or 2000 for the first time. Those groups for whom occupational grouping cannot be inferred are classified as mixed, the default

grouping in all regressions, so coefficients on manual and non-manual groups are biased downwards. This affects around 10 per cent of settlement groups in 1998 and 1999, rising to just under 20 per cent in 2000.

The measure of "workplace change" is a composite variable comprising one or more of the following: the introduction of new technology; flexible working time arrangements (from 1985); the end of "restrictive practices"; shift working or other productivity improvements (until 1998). Whilst the majority of the analysis will focus on this composite variable, the variable is disaggregated into its constituent parts in order to compare the incidence of the introduction of each form of change. It is also possible to isolate instances of multiple change, introduced as part of the same settlement. Therefore the paper contrasts the impact of single and multiple simultaneous changes to working practices in any given year. Each survey also asks the respondent whether settlement groups saw changes in their hours and holiday arrangements:

"Please indicate whether the settlement included [ ] the following improvements in terms and conditions: a reduction in the length of the normal working week; an increase in the length of holidays",

a positive answer to either would represent unambiguous improvement for employees.

The CBI dataset contains two wage measures. One option gives the percentage increase to average basic hourly/weekly rates of pay of the employees in the relevant settlement group. However, this wage variable is only available for the middle years of our period. We use the wage variable that has been used more frequently in academic study of the CBI settlement databank, which is the response to:

"Please indicate how much the settlement will increase the earnings of a typical employee in this group over the next 12 months. Please include the effect of bonus payments, merit awards etc, if made as part of the settlement".

Examining wage changes with employers' settlement data brings the advantage that it avoids the recall and measurement bias associated with individual level data. However, settlement wage data show a much lower level of increase over the period 1979 to 2000 than individual level wage series (Smith: 2000, Gregory et al 1985). This is largely due to the fact that individual level data will reflect changes in job, promotions and contingent elements of pay. Settlement data also show a much greater level of nominal rigidity (Brown et al: 2004) than individual data (Smith: 2000), but this again reflects the contingent element in the latter. It is appropriate to use settlement data for this analysis as we are examining what happens to a group of workers affected by the same workplace change. Also be looking at relative changes in wage levels we are controlling for unobserved characteristics. The wage increase variable employed is adjusted to reflect the real settlement wage increase, by deducting the percentage inflation rate in the month of the settlement from the nominal settlement increase.

In order to investigate whether firms which appear to be in crisis introduce more changes and change without associated wage rises, we construct some new variables. A dummy variable indicates whether the organisation subsequently drops out of the dataset permanently, which we take to imply that the firm goes out of business. An organisational level exit dummy is preferable to one for the settlement group, as it is possible for the organisation to merge previously distinct settlement groups which would erroneously imply problems for the firm. Additionally, a dummy is generated to show if there has been a fall in employment of at least 10 per cent between the previous year's settlement and this year's. To test the strength of the assumptions underlying these variables an additional variable interacting the two is created.

The choice of modelling technique for looking at the probability of workplace change is straightforward, either a probit or logit model may be used depending upon assumptions about the distribution of the continuous latent variable which is assumed to lie behind the observed binary dependent outcome variable. This chapter will report the marginal effects from probit estimations, a technique which is also appropriate for examining changes to hours and holidays, whilst wage increases can be modelled using ordinary least square

techniques. Looking at the incidence of multiple change is less straight forward, and will require an ordered probit estimation. Coefficients from ordered probit estimations indicate which variables are significant and in what direction they are related to the dependent variable. However, unlike a probit regression where marginal coefficients can be used to identify the exact size of relationship between one explanatory and the dependent variable, ordered probits require the creation of benchmark or ideal types to ascertain the scale of significant relationships. Benchmark settlement groups are introduced in the results section, during the discussion of multiple workplace changes.

5. Results

a) Patterns Of Change

Tables 3 and 4 show the pattern of workplace change by region and industrial sector. Before making comparisons by region or sector, we can immediately see that the incidence of change was higher at the beginning of the period, with a highpoint in 1979 and 1980, and dropped off sharply from 1990. This pattern does not conform to one of cyclically determined change. Given the economic downturn of the early 1990s one would expect to witness more change from 1990 onwards than in the late 1980's. Table 3 reports the pattern of change by region, and lists regional unemployment rates. Scotland and the North are the regions most affected by changes to working practices, with East Anglia and Yorkshire the least likely to undergo change. Whilst these regions include those with the highest unemployment rates this relationship is not strong; the correlation between areas of high unemployment and high rates of workplace change is not significant. Table 4 covers manufacturing industries from 1979, and adds in service ones from 1987. As one might expect, given the intensification of international competition from 1979 onwards and the tradable nature of manufactured output, the degree of change within manufacturing has on the whole been greater than that in services. Following Batstone and Gourlay (1986) change was concentrated in paper and publishing with a concentration of change in transport and communications amongst service industries. This probably reflects the swift advance in communications technology. Textiles had the lowest incidence of change of manufacturing sectors, conceivably because it relies on intensive, low paid labour. A

number of service industries, organisations in construction or leisure or miscellaneous categories, all saw much less change than in other categories; a result which may reflect the relatively low number of observations for these industries.

Whilst there is little sign of a cyclical pattern to the incidence of change, the decreasing occurrence over time is smoother within manufacturing. This decline may reflect either a shake-out of manufacturing inefficiencies meaning there are no changes left to make, or a severe alteration in the frontier of control between employers and employees, enabling the introduction of workplace change outside the annual settlement. Econometric analysis may shed more light on the explanation.

Econometric estimation on workplace change

The investigation of the determinants of workplace change is developed using regression analysis. The dependent variable for the regression is dichotomous, and therefore ordinary least squares estimation is unsuitable, producing biased standard errors. Instead we employ probit techniques to estimate equation 3:

Prob. Δ work practices = aX + bU + cWorkplace change$_{t-1}$ **Equation 3**
+ dP + e

where X is a vector of settlement group characteristics, U represents a dummy for union recognition, lagged workplace change is also an explanatory variable, vector P adds a variety of dummy variables representing economic pressures on the employing organisation, and e represents the error term. Whilst the coefficients from a probit regression indicate which independent regressors are significant and in what direction, they do not provide the correct magnitude of each influence. Therefore we calculate the marginal coefficients which give the percentage point change in the predicted probability, relative to the sample mean, given the presence of each variable.

Table 5 presents the marginal effects from the probit regression, with full probit results in appendix C1. The predicted probability of workplace change is 0.12 for 1979-2000, 0.22 for 1979-1983, 0.15 for 1987-1991, 0.07 for 1991-1995 and 0.04 for the last period. Union recognition is a crucial explanatory variable over all time periods. Looking at the sample as a whole, column 1, recognition is associated with a higher probability of workplace change, 0.20 as compared to the predicted mean of 12 per cent. This relationship is significantly positive across all periods. Occupational grouping is also important: workers in solely manual settlement groups have a 3 percentage points greater likelihood of undergoing change, whilst the probability for non-manual groups was 4 percentage points smaller. Whilst the association is fairly consistent across the five year sub-samples for non-manuals, manual settlement groups only have a significantly greater likelihood of change between 1987 and 1991. Lagged workplace change is consistently positively associated with change, groups experiencing change last year had a far greater probability of change this year: 0.31 overall; declining over the 1990s. The paper industry has a significantly greater chance of workplace change than other industries: 0.20, though this association declines over time. Service industries are on the whole less likely to see change, as are certain regions: Yorkshire, South West and East Midlands.

Continued employment

We tried to capture the effect that organisational crisis would have on the probability of change by creating dummy variables to identify which groups had seen a significant drop in size or who subsequently left the data set. Of these variables only one reaches significance, the dummy indicating a drop in employment of at least 10 per cent. Although this is negligible in the first column, the whole period, it achieves significance during both economic downturns and the upturn of the 1990s. However the coefficients are inconsistent: in the first period an employment drop is correlated with a lower probability of change, 19 per cent compared to a mean probability of 22 per cent. Yet in both the later periods the relationship is positive, raising the probability by one and then two percentage points. The latter seems more intuitive, as any problems requiring sizeable cuts in employment might be ameliorated by workplace changes. During the period 1979-1983

inefficiencies and uncompetitiveness may have been addressed by cutting jobs rather than introducing new methods or technology (Nolan and Walsh: 1995).

The only consistent trends evident from this table are the relationships between union recognition and lagged change with contemporaneous workplace change. Table 2 showed the incidence of workplace change declined monotonically, yet the relationship between recognition and change was greater at the end of the 1990s than at the end of the 1980s. This may indicate either that only organisations recognising unions need further changes, or that unions are better able to retain influence over the introduction of workplace change, and thus retain power as defined by the second dimension (Lukes: 1974). It seems unlikely that only unionised plants need workplace change, which makes the latter a more plausible explanation. The association between lagged and current change is also positive, though decreasing over the period. This could indicate either a lack of success arising from a first round of changes, or that by introducing an initial change, employers overcome resistance and find it easier to call for further changes as part of the next settlement. This issue will become clearer once we have examined the relationship between remuneration, organisational difficulties and change

Types of workplace change

Table 2 presented sample means, and indicates that the most common type of workplace change was the rather vague introduction of productivity enhancing change, followed by flexible working time arrangements, new technology, the removal of restrictive practices, with shift work as by far the least common option. Table 6 examines the introduction of each form of change, using probit regressions of similar form to equation 3. Marginal effects are reported in table 6 with the full probit results presented in appendix C2. The predicted probability of introducing other productivity agreements is greatest at 0.06, shift working the lowest at 0.01, and other forms of change falling between these two. That productivity boosting measures is the commonest is not surprising: its vague nature will cover a multitude of actual changes. The low level of technical change is more surprising given the development of microchips and computers and their widespread use

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(Machin: 2001). This low incidence of shift introduction reflects the limited scope for their use in many industries and the abolition of restrictive practices is likely to be limited to settlement groups with formerly strong unions (Daniel: 1987). A range of explanatory variables are similarly related to each form of workplace change: unionisation; lagged change; occupational status and falling employment.

Trade union recognition is positively associated with each form of change: most strongly with other productivity agreements, and least strongly with shifts. Again this has two possible explanations: that change is more necessary in unionised groups; or that unions have greater influence over change and thus ensure that it is linked to the annual settlement. Lagged change is positively correlated with all forms of change, with the coefficients exceeding those on union recognition. In discussing table 5 we considered that the link between lagged and current change could indicate either that previous change was ineffectual, or that having overcome employee resistance managers wanted to further improve working methods and practices. If organisational crisis is associated with workplace change we would expect to see a positive relationship between employment falls in particular and all or most types of change. However, only flexible working and the abolition of restrictive practices are positively linked to employee cuts. New technology and productivity deals are negatively associated with firms who have cut labour. New technology may prove too expensive for firms in trouble who are forced to cut labour, but the vagueness of the category "productivity agreements" would seem to offer such firms a chance to improve their position. No forms of change are significantly related to disappearance from the dataset. We are still not able to reach a definitive conclusion on the relationship between earlier and current change, but as employment falls are not positively related to all forms of change, that fact that all five types are associated with lagged change seems more consistent with the idea that employers have broken any workforce resistance.

Occupation matters: non-manual groups have a slightly lower probability of all forms of change; manual settlement groups are significantly more likely to undergo flexible working and productivity agreements and to suffer the abolition of restrictive practices. We know that manual workers were most affected by the recession of the early 1980s (Nolan

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and Walsh: 1995) which would often leave those in employment facing workplace change, but non-manuals have undoubtedly been faced with new technology (Machin: 2001), so the negative non-manual result is less well explained. The WIRS data in table 1 identified the greater influence of manual shop stewards in change negotiations, so it may be that non-manual workers are less able to link changes to their annual settlements. All five types of change were less common across the service industries, whilst paper and publishing witnessed significantly more of all change but shift working. ACAS (1988) identified size as an important variable in determining workplace change; in the CBI data set the introduction of most forms of change is positively correlated with the largest settlement groups, those of 500 or more, and negatively related to those of less than 25 employees. Where small groups reflect small establishments lower change may be due to differences in unionisation by size (Millward et al: 2000) and the lack of formal human resource management (Scase: 1995), both of which will impact upon employee influence over change.

Multiple incidences of workplace change

Next we examine the number of simultaneous workplace changes introduced in a single year. What are the probabilities that settlement groups will experience multiple instances of workplace change within one annual settlement? We anticipate multiple changes are introduced at a time of crisis so occurrence should be more common in the early 1980s and 1990s when unemployment was rising, and where firms are laying off employees or about to exit the data set. Again ordinary least squares techniques are inappropriate, but so too is the standard probit technique. Having a categorical dependent variable requires that we undertake an ordered probit regression.

Firms were able to introduce four and, between 1985 and 1997, five, types of change as part of each annual settlement. We condense the categories into four groups due to small cell sizes. The appropriate category will depend on certain cut-off points on the continuous scale. We define an unobserved underlying latent variable, n^*, which represents the propensity to introduce workplace changes. Then the observed incidence of change is given

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by $n=0$ if $n^* < c_0$, $n=1$ if $c_0 < n^* < c_1$, $n=2$ if $c_1 < n^* < c_2$, $n=3$ if $c_2 < n^* < c_3$, and $n=4$ if $c_3 < n^*$ where the c's are the cut-off points between which the latent variable falls. Then, the probability that a settlement group belongs in the first category, $n=0$, can be given as:

$$\mathbf{Pr\ (n=0) = Pr\ (n^* < c_0)} \qquad\qquad \textbf{Equation 5}$$

$$= \mathbf{Pr\ (\beta x + u < c_0)}$$

$$= \mathbf{Pr\ (u < c_0 - \beta x)}$$

$$= \mathbf{\Phi\ (c_0 - \beta x)}$$

Φ is the cumulative normal distribution. Similarly,

$$\mathbf{Pr\ (n = 1) = \Phi\ (c_1 - \beta x) - \Phi\ (c_0 - \beta x)}$$

$$\mathbf{Pr\ (n = 2) = \Phi\ (c_2 - \beta x) - \Phi\ (c_1 - \beta x)}$$

$$\mathbf{Pr\ (n = 3) = \Phi\ (c_3 - \beta x) - \Phi\ (c_2 - \beta x)}$$

$$\mathbf{Pr\ (n = 4) = 1 - \Phi\ (c_3 - \beta x)}$$

Taking the log of each probability and summing gives the log likelihood function. This can then be maximized, using a suitable optimisation technique, with respect to the parameters of interest and the cut-off points. The results of this ordered probit estimation are presented in table 7. Again lagged workplace change and union recognition prove to be significantly positively related to multiple change, and falling employment becomes significantly positively associated in the 1990s. However, although the coefficients in table 7 indicate which explanatory variables are significant and in what direction, the magnitude of the effect cannot easily be determined. The size of the influence is best explored using benchmark settlement groups, ideal types constructed to offer a clearer narrative.

Benchmark settlement groups

Table 8a looks at the probabilities that three benchmark settlement groups underwent multiple changes in any one year, using the entire range of the dataset. The benchmarks are: type a "MechEng", a unionised manual group of 26-50 employees in a mechanical

engineering plant in the West Midlands; type b "TransDib", a mixed occupational group of 201-500 bodies in a unionised transport and distribution firm in East Anglia; and type c "Bricks", a group of less than 26 non-manual workers in a non-union brick plant in the South West. The differences are greatest when comparing MechEng and TransDib with Bricks across the whole sample period. MechEng has an 11.6 percentage probability of experiencing one change; TransDib has a 10.5 per cent chance; and Bricks has just a 6.1 per cent chance. Type a and b have around a 4 percentage probability of two forms of change in a given year, whilst the probability for Bricks is just half that. The probability of the introduction of three or four changes simultaneously is slight for all groups, but again MechEng and TransDib have a chance roughly twice as large as Bricks. Type a and b groups differ in industry, size and region but the factor common to MechEng and TransDib type groups is union recognition; as shown in earlier tables union recognition seems to be closely related to change. There are two possible explanations for this: the presence of a union may have formalised relations so that changes of this nature are considered to be issues for negotiation and inclusion in the annual wage deal; or unions' associations with inefficiencies such as restrictive practices mean more change is required. We pursue the source of the variation by examining shorter time periods.

As before the data set is broken in to four periods corresponding to two upturns and two downturns in the economic cycle, table 8b. As not all forms of workplace change were investigated over the entire period, comparisons are between the probability of just one, two or three changes in an annual deal. For the earlier period it is only possible to compare benchmark groups for the manufacturing industries, MechEng and Bricks. MechEng has double the probability of experiencing one change, three times the probability of two changes and four times the likelihood of three or more changes as Bricks. As both benchmark types are small groups, with associated capital constraints and more informal industrial relations climates, this divergence of probabilities must surely be linked to union recognition.

In later periods the contrast is between a large mixed occupation service sector group, TransDib, and MechEng, a small manual group in an engineering plant. The variation

between these is much greater across the shorter time periods than indicated by analysis of the full twenty year dataset. Between 1987 and 1991 MechEng was twice as likely to undergo one change as Transdib, but the probability that Mecheng would undergo multiple changes was far greater. The recession of the early 1990s damaged industrial sectors more evenly than the first recession. However, over the period 1991-1995 workplace change is still much more likely to involve MechEng groups. The final period, 1996-2000, shows even greater polarity. MechEng groups have a 16 per cent probability of bearing one change, and a 0.05 probability of witnessing three or more, this compares to 4.5 per cent and 0.005 for TransDib. Comparisons of MechEng and Bricks showed that type a groups had a greater likelihood of change, and we suggested that this difference reflects different union recognition status. However, later comparisons are between two unionised groups, and still MechEng is much more likely to undergo change. That a small group is likely to undergo more changes than a much larger one is counterintuitive, and as both benchmark types are unionised this is unlikely to be a factor in the divergent picture of change. The high rate of change in engineering fits with the recorded problems manufacturing faced (Nolan and Walsh: 1995) and the opportunities to introduce new technology.

b) "Rewards" For Workplace Change

It was hypothesised that workplace change would be accompanied by a higher than average wage increase, or improvements to hours and holidays in recognition of the greater effort expected of employees, and that groups with recognition will be better able to extract these rewards than employees without union representation. Correlation coefficients between the workplace change dummy and "reward" variables over different time periods are presented in table 9. The wage variable used is a dummy which indicates that a positive real wage increase was obtained, hours and holidays improvements are also represented by dummy variables. Row 1 presents correlations across the whole 22 year period. There is a small, but significantly positive relationship between workplace change and forms of "reward", with changes to holidays the most strongly associated with change.

The remaining rows of the table look at the four shorter periods. There is no evidence that the ability of employees to obtain compensation for change is strongly cyclically determined or that there has been a downward trend in "rewards" for change: real wage increases were positively associated with change in each period. Beatson (1995a) finds that the UK has seen far fewer concessions over working time than other EU nations. However, improvements to hours and holidays become more common towards the end of the period, particularly since 1996. As inflation was low and stable at the end of our sample this probably reflects a reduced need to take rewards in the form of pay rises. This would suggest that whilst obtaining compensation for change has not declined over time or varied with the economic cycle, the type of reward is cyclically influenced

Econometric estimation

Regression analysis is employed to look for the influences behind changes to wages, hours and holidays. For the analysis of wage changes the dependent variable is a continuous percentage increase, meaning that ordinary least squares techniques are appropriate for an equation taking the form of 6:

$$\Delta \text{ Remuneration} = aX + bU + c\text{Workplace change}_{t-1} + dP + f\text{Workplace change}_{t} + e \qquad \text{Equation 6}$$

where X is a vector of settlement group characteristics, U represents a dummy for union recognition, both current and lagged workplace change are explanatory variables, P is a vector of variables indicating potential financial difficulties and e represents the error term. Full results are presented in appendix C3. Placing workplace change on the right-hand side, as an explanatory variable, gives rise to concerns about endogeneity. This will be a factor if workplace change is correlated with the error term in equation 6, and the OLS coefficients will be biased. In such circumstances the best action is to employ an instrument for the endogenous variable, exemplified by the use of lagged absenteeism in the turnover equation of chapter 3. However, in this particular case there is no obvious instrument; we cannot use lagged workplace change as this would alter the nature of the wage-effort bargain so that it

became one of post-change gain sharing. In order to ascertain whether this is a problem we will examine the size and significance of the resulting coefficients.

Looking at the whole sample, column 1 of table 10, the introduction of change, union status, occupational identity and financial pressures are all significant variables. The mean real wage increase is very small, but with the introduction of change it increases tenfold. The size and significance of the coefficient on change, both overall and in each of the shorter periods, is such that it is unlikely to purely reflect endogeneity bias. Unionisation is significantly associated with an actual real wage cut, of 54 percentage points, which is in line with the decay of the union wage premium over the 1980s (Gregg and Machin: 1991). Both manual and non-manual groups achieve better rises than the default of mixed bargainers, manuals achieving nine times the average and non-manuals around 14 times. The influence of pressure on the firm is mixed: a fall in employment is an insignificant factor, but in the last year that a firm appears (taken to imply closure) the settlement wage outcome is a negative in real terms which contrasts sharply with Lawrence and Lawrence (1985) who found employees were able to achieve real wages gains right up to the point of closure.

As one would expect in a recession, the real wage settlement outcome between 1979 and 1983 is negative. Unionisation and imminent disappearance from the dataset are strongly negatively related to the wage outcome. Those groups with recognition or whose firm folds are predicted to see a cut of around 2.5 per cent, compared to an average fall of 1.6 per cent. Where workplace change has been introduced the cut is smaller, just over 1 per cent, indicating the resilience of rewards for change. Lagged change is also associated with a lower wage cut, of around 1 per cent rather than 1.6 per cent. The relationships between wages and occupation are greater than overall, both manual and non-manuals have significantly smaller losses than the default mixed groups. This is the only period in which manuals obtain a positive wage outcome compared to the default, which may indicate that they were being rewarded to reduce resistance to radical change. The second period, 1987-1991, representing an economic upturn, saw a very slightly negative real wage change, 0.17 per cent, reflecting the inflationary fall out of the Lawson boom. However, where change

was introduced the settlement became slightly positive, at around half of one per cent. Lagged change is now associated with a negative wage outcome, possibly indicating that firms failed in get out of trouble by introducing change. Kelly (1990) reports that unions were able to win pay rises which exceeded the rate of inflation from the mid 1980s onwards, despite a slowdown in productivity growth. These data show that union recognition is positively related to wage rises, leading to a neutral wage outcome. It may be that the upturn allowed unions to attempt to restore their wage premium. This idea of catch up is consistent with the fact that manufacturing groups out performed service ones on the whole. The firm's position has a different role, with imminent disappearance no longer related to wage change. However, where employment fell significantly the predicted wage change outcome is negative at around half of one per cent.

During the third period the average real wage outcome was slightly positive, at 0.3 per cent. The only significant factors are workplace change and firms' "strength". Both a drop in employment and imminent departure from the dataset cancel out the small wage increase. Change in the current round is associated with a wage increase of around 60 percentage points, yet groups who experienced change as part of the previous settlement are likely to experience no increase. Non-manual groups achieve a very small additional wage rise. During the economic upturn of the late 1990s the average real settlement is predicted to be a rise of around one half of one per cent. The strength of the firm is still influential: the increase is slightly lower where employment has fallen and an imminent disappearance leads to a neutral wage outcome. Groups who experienced change in the last settlement have no wage penalty whilst a positive premium for contemporaneous change is still observed, at around one half of one per cent. Non-manuals again outperform other occupational groups.

Workplace change is positively related to a wage increase across the twenty year period, even during the severe recession of the early 1980s at which point competitive pressures and economic and political changes impacted upon employment levels and industrial relations climates. This indicates that employees retain an ability to extract rewards for change. However, the union coefficients indicate that this is not due to a positive union

voice effect. Gregg and Machin (1991) find the positive union wage premium was attacked during the 1980s, which is consistent with the wage cut experienced by unionised groups in our first period. Kelly (1990) finds that unions were able to restore their influence in the late 1980s as unemployment fell, and this again fits with the positive coefficient in the CBI data set between 1987 and 1991. If unions are not able to demand remuneration in return for undergoing workplace change it indicates that employers are choosing to offer better wage rises to prevent employee resistance. That lagged change is not positively related to positive wage settlements over the period is consistent with our model of a sequential one period wage-effort bargain. The negative association between both employment falls and disappearance from the data set and wage outcomes confirms our hypothesis that employees would not profit from firm problems.

Improvements in working hours and holidays

Tables 11 and 12 perform the similar search for evidence of rewards for workplace change using hours and holidays as the dependent variables, using equations 7 and 8. Full results are presented in appendices C4 and C6, with probit coefficients offered in appendices C5 and C7.

$$\Delta \text{ working hours} = aX + bU + c\text{Workplace change}_{t\text{-}1} \qquad \textbf{Equation 7}$$
$$+ \ dP + f\text{Workplace change}_{t} \ + e$$

$$\Delta \text{ holidays} = aX + bU + c\text{Workplace change}_{t\text{-}1} \qquad \textbf{Equation 8}$$
$$+ \ dP + f\text{Workplace change}_{t} \ + e$$

where estimations use probit techniques and X is a vector of settlement group characteristics, U represents a dummy for union recognition, both current and lagged workplace change are explanatory variables, P is a vector of variables indicating potential financial difficulties and e represents the error term.

The predicted probability of reduced working hours is low across the sample. Looking at the marginal coefficients in table 11, it is clear that the crucial factors associated with changes in working hours are union recognition, workplace change and the firm's financial position. Workplace change becomes more strongly associated with improved hours over time, with some cyclicality evident. Initially it has no impact, whereas during the first economic upturn, 1987-1991, it raises the probability of changed hours by 13 percentage points and by the final period the probability is 25 points higher. In contrast to the wage analysis but in line with the arguments of Kochan (1980) and Green et al (1985), union recognition is positively related to shortter hours in all but the first period, though this effect lessens over time. There does not appear to be a negative relationship between firms in trouble and cuts in working hours: whilst a fall in employment might be expected to reduce the likelihood of improved working hours, this relationship is only observed in the first five and last five years of the sample; during the early 1990s the probability of changed hours rose from 1.5 per cent to 2.5 per cent where employment fell.

Improved holiday entitlements are more likely than reduced hours across the whole sample. The relationships between both workplace change and union recognition and the likelihood of longer holidays are stronger than with improved working hours. During the first recession, the probability of better holidays being introduced was 24 per cent, rising to 33 per cent where unions are recognised or 27 per cent with the introduction of change. The union coefficient was greatest between 1979 and 1983, decreased over the late 1980s and then increased. The relationship between workplace change and holidays fluctuated over the period, disappearing in the two middle periods but boosting the probability of longer holidays to 6 per cent in the final few years. A poor firm position was associated with less chance of change early in the sample, but thereafter proved insignificant. During the 1980s recession lagged workplace change was associated with a reduced the probability of change from 24 per cent to 18 per cent, though this relationship was also short lived.

Overall the data suggest that workers undergoing workplace change continue to enjoy "rewards" in the form of a better than average pay deal, or possibly improved hours or holidays. There is no sign that this ability to obtain rewards has decreased due to secular or

cyclical influences. However, cyclical pressures do seem to influence the *type* of reward employees enjoy. The size of the wage increase accompanying workplace change has fallen over time, as the probability of improved hours and holidays increased: this is against a backdrop of falling and increasingly stable inflation which makes wage rises less crucial. Whilst we predicted a positive union voice effect this is only evident in terms of wages during the late 1980s. Prior to this the positive relationship between workplace change and wage increases suggest employers were choosing to buy industrial peace. However, union recognition is associated with a greater probability of better hours and holidays. Green (1997) outlined the importance of increasing holiday entitlement as part of a union strategy to control the wage-effort bargain, and the same argument can be applied to reducing working hours. Unsurprisingly, where change is introduced in tandem with economic problems the wage outcome is negatively affected, but this also significantly lowers the probability of reduced working hours. Analysis of wage increases highlighted the strong position of non-manual workers relative to manuals and particularly the default, mixed groups. However, when we broaden our focus to examine the probability of improved holidays and hours, we find mixed groups are more likely to be rewarded in this way.

Compensation for multiple workplace changes

The introduction of multiple changes is likely to be more disruptive and more demanding so it seems logical to look for variation in the size of "reward" according to the number of workplace changes witnessed. Table 13 presents OLS estimates for equation 9:

Δ **Remuneration = aX + bU + c Workplace change$_{t-1}$**   **Equation 9**

         + dP + f One change$_t$ + g Two changes$_t$

         + h three or more changes$_t$ + e

where X is a vector of settlement group characteristics, U represents a dummy for union recognition, lagged workplace change and the number of contemporaneous changes are explanatory variables, P is a vector of variables indicating potential financial difficulties and e represents the error term. Up to five changes may be introduced in certain years, but

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as shift working is not an option prior to 1985 and productivity enhancing change is dropped after 1997, and to boost cell sizes, we consider only one, two or three or more changes as explanatory variables. The diagnostics are marginally better in this model than where change is a simple dichotomous variable.

Separating out the number of changes introduced does seem important. Overall undergoing three or more changes is associated with a better pay deal than two, and two is better than one, which is better than none. The average predicted wage change for the full period is 0.03, rising by 22 percentage points with one change, 37 percentage points with two and 56 percentage points for three or more. This indicates that employees enjoy an escalating pattern of rewards for the disruption or demands for extra effort they experience. However, this pattern of increasing returns accompanying multiple changes is not consistent over the shorter time periods, which highlights the importance of lmore detailed ongitudinal analysis. During the early 1980s recession there is a slight premium attached to experiencing one change; subsequently returns to one or two incidences of change first increase but then fall; returns to three or more types of change are only witnessed between 1987 and 1995. Originally we hypothesised that those firms introducing simultaneous change would be those in trouble, and hence they would be unable to offer compensation for extra employee effort. Although the wage increases do decrease over time, their existence is not consistent with the idea that introducing simultaneous changes indicates firms are in trouble. The fall in "rewards" is more likely to be linked to the fall in inflation. Indeed, as in table 10, the coefficients on variables constructed to indicate firms in trouble, falling employment and imminent disappearance from the data set, are negatively associated with wages.

Improvements in working hours and holidays

We turn next to an examination of the discrete impact of one, two or three plus changes on working hours and annual leave. Tables 14 and 15 present marginal probit coefficients for equations 10 and 11:

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$$\Delta \text{ hours} = aX + bU + c\text{Workplace change}_{t-1} \qquad\qquad \textbf{Equation 10}$$
$$+ \; dP + f \text{ One change}_t + g \text{ Two changes}_t$$
$$+ \; h \text{ three or more changes}_t + e$$

$$\Delta \text{ holidays} = aX + bU + c\text{Workplace change}_{t-1} \qquad\qquad \textbf{Equation 11}$$
$$+ \; dP + f \text{ One change}_t + g \text{ Two changes}_t$$
$$+ \; h \text{ three or more changes}_t + e$$

where the coefficients are as before, and the full marginal and probit results can be found in the appendices. The diagnostics are again marginally better where change is differentiated.

Across the 22 year period, the number of changes do have a differential, though non-monotonic, impact on hours outcomes. The baseline probability of hours change is predicted to be 4 per cent. This rises to around 6 per cent with one change, 5.5 with two and 7.5 with three or more changes, but again it is crucial to examine the shorter panels. During the 1980s there is no additional gain associated with any number of changes. By the early 1990s, the probability of a cut in hours is just 1.5 per cent. rising to 3 per cent with one change or 4 per cent with three or more. Over the final five years one, two and three types of changes are all associated with a greater likelihood of an hours reduction. The base probability is half of one per cent, rising to just under 2 per cent, 5.5 per cent and 7.5 per cent respectively.

In contrast to Green's (1997) findings, improved holidays became less common over time according to this dataset. Multiple change exerted little influence over the probability of changes to time off. In both the first and final period undergoing one form of workplace change boosted the probability of longer holidays, from a 24 to 28 percentage point likelihood and later from a 2.5 to 8 percentage point chance, whilst experiencing two or three plus changes is not significantly linked to better holidays across the five year periods.

Multiple changes are associated with escalating wage increases, though the effect fell over the four sub-samples. The relationship between improved working hours and multiple

changes became stronger as wage rises dropped off, in line with falling and stable inflation. However, the relationship between holiday improvements and changes was inconsistent with this: there was no increase in the probability of longer holidays as more changes were introduced.

Discussion

The scope of unions' voice has become more limited over time according to the WIRS data discussed earlier in this chapter, a process documented elsewhere which led to the coining of the term "partial derecognition" (Brown et al 1998, iii). As we know that unionised employees have a greater chance of exercising influence in decision making than non-union employees who are organised (Terry: 1999), and those who are unorganised, we can conclude that the scope of employee voice is reduced. CBI data show that the introduction of workplace change at the time of the annual pay settlement becomes less common over time. The introduction of change at other times would of course indicate an unambiguous fall in employee voice. This would suggest a partial decline in power as proxied by the right to negotiate over change, in tandem with the wider decline in union recognition and density. In this data set workplace change remained positively associated with union voice throughout the period, though the strength of the relationship has fallen over time, and is weaker for non-manual groups. There are two possible explanations for the continuing relationship between recognition and change: that unions retain influence over workplace change so that it remains tied to the establishment's annual settlement; or that only workplaces with trade unions need to introduce changes to improve efficiency. We hypothesised that change implies greater effort and so must be rewarded. The issue of why unions remain associated with workplace change may be answered by looking at union influence over these "rewards".

We find that workers continue to be "rewarded" for workplace change, generally in terms of better than average wage increases, but during the 1990s increasingly in the form of better hours and holidays. A positive union voice effect is short-lived in the case of wages, but unions remain positively associated with rewards in the form of hours and

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holidays trade offs. These results suggest that the relationship witnessed between change and union recognition reflects continued influence and an ability to link change to the annual settlement rather than a greater need for change in unionised settlement groups. Whilst employees were better rewarded in terms of wage rises for multiple changes during the late 1980s, this effect declined as inflation fell. Escalating benefits were still observed between 1996 and 2000 in terms of a greater probability of reduced hours as the number of simultaneous changes increased. We also find that whilst change is no more common for firms in difficulty, perhaps reflecting capital constraints, their remunerative settlements are less generous.

6. Conclusions

Lukes' (1974) model identifies three levels of power: firstly, the ability of parties to "win" issues and influence decisions; secondly, control over the bargaining agenda; thirdly, ideological control which is beyond the scope of the paper. Whilst these dimensions do not have to be pursued sequentially, the ability to exert influence over issues of the second dimension indicates greater success. In the context of this paper the second dimension can be proxied by looking at the ability of employees to have influence over the bargaining agenda, in relation to the introduction of workplace change. Therefore a fall in influence over the introduction of workplace change as part of the annual establishment settlement implies a fall in power. The first dimension of Lukes' model can be examined through analysis of changes in remuneration in the context of changes to working practices. The greater employee effort involved in accommodating changes means that the introduction of new working methods, technology, shifts and the end of restrictive practices should be accompanied by a compensatory wage increase or better working hours or holidays.

Data from the Workplace Industrial Relations Surveys illustrated that the influence of trade union representatives in regard to workplace change had fallen, particularly since 1990, in line with the idea that union have suffered partial recognition for certain issues even where they continue to have a formal relationship with management. Given trade union representatives are likely to exert greater influence than non-union representatives or

unorganised employees, we can be confident that employees' influence has decreased. Recent WIRS data, along with other sources, suggest that workplace change is extremely common, which is inconsistent with the picture from CBI settlement data. In the context of continued intense competition and technological innovation it is unlikely that all of this recorded fall in workplace change in the CBI data is due to an actual decline in change. We must infer that workplace change is occurring outside of the annual establishment settlement. The hypothesis that unions would have a greater chance of retaining influence over workplace change that non-union representatives or unorganised workers is borne out as union recognition is strongly and consistently associated with change. This may reflect a greater need for change in practices associated with unionised groups, or their ability to link change and settlements. A definitive conclusion requires we look at union influence over remuneration at the time of change.

Wage increases are significantly higher for settlement groups experiencing workplace change. Improved working hours and holidays were also significantly associated with the likelihood that groups experienced change, increasingly so towards the end of our period as inflation falls and makes real wage rises less essential. The association between union recognition and pay for workplace change varies over the twenty-year period. Initially union recognition is associated with both changes in working practices and real wage cuts. This is consistent with the need to remove union inefficiencies and their positive wage premium at a time of intense competition and profound economic and political change. Subsequently, unionised groups showed a slightly greater probability of gaining positive remuneration, generally in the form of better hours and holidays. This supports the argument that union recognition and workplace change remain correlated because unionised groups have enough power to link the two for bargaining purposes.

We considered that settlement groups in organisations facing difficulties, forcing them to cut significant number of staff or to close, would be positively linked to the incidence of workplace change and negatively associated with compensatory remuneration. Whilst there is no relationship between indicators of firm distress and the introduction of change, firms who significantly cut employment or subsequently disappear from the data set do offer

significantly lower remunerative packages. The introduction of multiple changes as part of a single annual settlement might also be indicative of a workplace experiencing problems. We found that the probability of experiencing multiple changes was accompanied by escalating wage increases for the late 1980s and early 1990s, and each change was associated with a grater likelihood of reduced hours in the late 1990s. This implies that multiple change might have been a reaction to difficulties in the early 1980s, but not in our later sub-samples.

Overall our results suggest a fall in the ability of employees to influence the introduction of workplace change, in so far as fewer annual settlements are associated with change despite an economic environment of continued competitive pressure and technical development. The continuing association of positive remuneration with workplace change is consistent with the concept of an equitable wage-effort bargain. The positive relationship between union recognition and rewards for change across the period, save for the early 1980s recession, indicates continuing union influence in one of the core areas of the employment relationship.

Table 1: Negotiations over Workplace Change, Workplace Industrial Relations Surveys 1980, 1990, 1998

Issues	1980		1990		1998
	Manual staff	Non-manual staff	Manual staff	Non-manual staff	All Staff
Holidays	12.2	13.1	NA	NA	NA
Length of working week[1]	11.5	11.9	86.1	83.8	NA
Pensions[2]	8.7	6.2	NA	NA	53.0
Physical conditions[3]	48.6	42.5	76.9	74.0	12.1
Number of recruits	31.7	26.1	29.0	34.5	2.5
Redeployment	47.4	41.1	67.4	68.3	NA
Redundancy[4]	38.5	30.8	48.1	50.8	NA
Staffing levels	37.1	28.0	54.7	55.5	5.6
Major changes in productivity methods[5]	36.0	26.8	23.8	15.9	NA
Capital investment!	10.4	8.2	9.2	8.4	NA

The columns show the proportion of managerial respondents in the 1980, 1990 and 1998 samples who claimed to negotiate over these issues.

NA indicates a question was not asked in this year.

[1] The 1980 question refers to the length of the working week, whereas the 1990 survey limits the question to reorganising work hours.

[2] in 1998 the questions asked were very different: pensions would be subject to discussion under the heading pay and conditions of employment.

[3] Physical conditions were covered only in so far as they had health and safety implications.

[4] Whilst in 1980 the question referred only to redundancy, by 1990 mangers were only being asked if they discussed redundancy payouts – which infers a fall in influence.

[5] Respondents are asked if this has been discussed in the last three years in the 1990 questionnaire, whereas 1980 does not specify a time period.

Table 2. CBI Sample Means

	Whole Sample August 1979 – July 2001	1979-1983	1987-91	1991-95	1996-2000
Industry					
Food, Drink, Tobacco	8.19	11.08	7.96	6.10	6.22
Chemicals	13.65	13.99	14.49	12.68	12.48
Metals	5.97	7.36	5.34	5.58	5.37
Mech. Eng	24.48	32.28	24.72	19.87	18.56
Inst. Eng	11.50	14.29	12.18	10.63	8.34
Textiles	5.86	7.81	5.68	4.61	4.79
Bricks	4.27	5.20	3.70	3.39	4.43
Paper, Publishing	5.52	8.00	5.10	4.57	4.48
Construction	0.54		0.32	0.82	1.14
Transport & Communications	2.83		2.71	4.22	5.30
Distributive Trades	4.29		5.98	5.88	7.23
Insurance	3.25		5.36	5.17	3.98
Prof. Services	8.39		4.89	14.57	15.65
Leisure Services	0.67		0.97	0.95	1. 08
Misc. Services	0.59		0.62	0.96	0.95
Regional Unemployment	8.66	8.84	7.77	9.22	5.76
Unionised	48.08	76.13	52.77	32.60	23.98
Group Size	762	288	957	879	1121
Occupation					
Manual**	36.52	40.53	38.43	32.62	28.90
Non-Manual**	38.64	26.32	40.20	46.84	40.41
Mixed**	22.07	21.52	21.34	20.51	22.51

Table 2. CBI Sample Means cont.

Settlement Detail	Whole Sample	1979-1983	1987-91	1991-95	1996-2000
Any type of workplace change	14.40	23.26	17.52	8.90	5.58
Removal of restrictive practices	4.34	7.67	5.09	2.86	1.45
Shift Work	1.75	2.10	2.20	1.45	1.09
New Technology	4.54	8.20	4.90	2.50	1.87
Flexible working time arrangements (only introduced from 1985)	5.53	-	7.59	5.05	3.39
Other productivity improving changes (not asked from 1998 onwards)	8.31	16.35	8.52	1.97	0.89
Real pay rise (%)	0.21	-1.69	0.35	0.53	0.88
Nominal pay rise (%)	5.39	8.28	6.74	3.35	3.32
Hours Change	4.84	12.16	5.76	1.91	1.11
Holidays Change	10.21	24.46	7.70	3.38	3.76
Attrition dummies					
10% or more drop in employment from previous year	21.22	15.67	25.06	24.51	20.08
Last time firm is in dataset***	11.16	10.55	10.26	10.89	12.94
Last time firm is in dataset & 10%+ drop in employment ***	2.28	1.44	2.93	2.48	2.01

Services were only included in the CBI dataset from 1987 making comparison between the first and other columns difficult. **There are settlement groups that are not assigned to any of the three occupational categories as from 1998 no data on occupational group was collected. For these years group was inferred from previous years' entries, which leads to omission in the case of new settlement groups. For 1998 and 1999 this means we are unable to infer skill level for around 10% of all settlement groups, though this rises to almost 20% in 2000. However, the construction of all regressions places such observations in the default mixed category. If anything, this will negatively bias the coefficients on manual and non-manual groups. *** These dummies are taken to imply that the firm has gone out of business.

This table shows the percentages falling in to each category.

Table 3. Incidence Of The Introduction Of Workplace Change By Region

Year	Groups	Scotland	North	Yorkshire	East Midlands	East Anglia	South East	South West	West Midlands	North West	Wales
1979	930	41.4 (5.9)	14.0 (7)	31.8 (4.2)	22.2 (3.3)	28.0 (3)	22.9 (2.5)	14.8 (3.8)	33.6 (4.2)	26.9 (5.4)	25.5 (5.7)
1980	1361	31.6 (9.1)	36.3 (10.8)	20.6 (7.9)	23.8 (6.6)	23.5 (5.8)	25.8 (4.8)	21.7 (6.1)	26.9 (8.6)	27.3 (8.4)	29.2 (9.5)
1981	1430	26.9 (11)	22.8 (13)	16.2 (9.9)	20.7 (8.2)	14.0 (7)	22.4 (6.4)	16.5 (7.5)	26.3 (11.4)	24.9 (11.6)	24.7 (11.6)
1982	1308	20.9 (12.1)	34.3 (14.1)	16.4 (11.3)	17.1 (9.3)	7.9 (7.9)	24.1 (7.3)	17.4 (8.6)	19.2 (12.7)	28.0 (13.1)	18.8 (12.8)
1983	1361	24.4 (12.4)	18.8 (14.8)	16.6 (11.5)	14.7 (9.7)	17.5 (7.8)	17.9 (7.6)	18.8 (8.8)	21.5 (12.6)	22.5 (13.5)	28.6 (13)
1984	1261	21.0 (12.9)	35.6 (15.5)	15.6 (12)	9.1 (10)	35.7 (8)	17.2 (8)	21.4 (9.2)	25.2 (12.9)	21.2 (13.7)	24.1 (13.6)
1985	1156	25.5 (13.2)	26.1 (15.5)	11.9 (12.5)	19.8 (10)	20.0 (8.4)	16.5 (8.2)	16.9 (9.5)	26.8 (12.8)	25.8 (13.8)	27.0 (13.8)
1986	1175	16.5 (14.3)	21.1 (15.5)	13.5 (12.6)	16.5 (10)	14.6 (7.7)	18.8 (7.8)	19.6 (9.1)	25.0 (12.4)	28.6 (13.9)	17.5 (13.8)
1987	1271	25.5 (12.5)	28.2 (13)	14.2 (10.5)	23.0 (8.1)	17.3 (5.6)	15.1 (5.9)	15.0 (7.1)	23.2 (9.8)	26.4 (11.6)	24.6 (11.6)
1988	1189	23.8 (10.1)	28.2 (10.5)	13.0 (8)	8.5 (6.2)	10.2 (3.8)	18.8 (4.2)	23.2 (4.8)	21.6 (6.8)	18.5 (9)	33.3 (8.9)
1989	1469	20.4 (8.5)	25.8 (8.7)	23.5 (6.8)	12.4 (5)	4.7 (3.7)	14.1 (3.7)	13.0 (4.2)	24.2 (5.9)	28.3 (7.5)	25.0 (6.7)

The table shows the percentage of workplaces in each region experiencing any workplace change as part of their annual settlement.
Figures in parentheses are the annual average regional unemployment rate

Table 3. Incidence Of The Introduction Of Workplace Change By Region, cont

Year	Groups	Scotland	North	Yorkshire	East Midlands	East Anglia	South East	South West	West Midlands	North West	Wales
1990	1426	21.9 (8.6)	34.4 (9.9)	12.4 (8.2)	14.1 (6.7)	14.9 (5.4)	13.9 (6.1)	22.4 (6.6)	30.3 (7.9)	24.3 (9.1)	23.1 (7.8)
1991	1603	15.5 (9.4)	19.2 (11)	5.7 (9.7)	5.1 (8.7)	2.9 (7.3)	6.3 (8.9)	7.8 (8.8)	9.2 (10.1)	13.6 (10.4)	13.0 (9.6)
1992	1662	11.4 (9.8)	12.2 (12.2)	8.4 (10.5)	6.2 (9.7)	6.0 (8.6)	5.7 (10.3)	9.1 (10)	9.0 (11.2)	8.6 (11)	7.2 (10.3)
1993	1673	12.9 (9.6)	9.6 (11.7)	10.9 (10)	4.3 (9.6)	6.7 (7.7)	5.9 (9.7)	9.0 (9)	11.6 (10.3)	8.1 (10.4)	11.2 (9.9)
1994	1629	19.0 (8.6)	11.4 (10.9)	8.0 (9.2)	10.6 (8)	8.9 (6.6)	7.9 (8.3)	10.5 (7.6)	15.4 (8.8)	10.1 (9.1)	10.0 (8.7)
1995	1751	9.8 (7.7)	7.9 (10.9)	2.6 (8.3)	4.6 (7.2)	4.7 (6.3)	5.9 (5.7)	6.6 (6.6)	7.7 (7.8)	10.5 (8.2)	11.1 (8.2)
1996	1401	7.4 (7.6)	16.3 (10.2)	6.4 (7.7)	8.6 (6.6)	11.5 (5.8)	3.8 (5)	5.0 (6)	10.2 (7)	9.5 (7.6)	11.5 (7.9)
1997	1512	10.7 (6.3)	6.2 (8.2)	8.9 (6.2)	3.7 (4.7)	1.5 (4)	3.6 (3.3)	5.8 (4.2)	9.9 (5.4)	9.3 (5.9)	7.6 (6.3)
1998	1394	4.2 (5.7)	4.2 (7.3)	7.1 (5.5)	5.0 (4)	7.1 (3.3)	1.7 (2.6)	3.9 (3.4)	7.8 (4.6)	3.3 (5.2)	2.7 (5.5)
1999	1342	5.5 (5.3)	0 (7.1)	5.8 (5.1)	3.0 (3.7)	6.8 (2.9)	3.9 (2.3)	4.7 (3.1)	5.8 (4.5)	6.3 (4.7)	4.2 (5.1)
2000	1392	9.6 (4.8)	7.6 (6.4)	2.7 (4.5)	6.1 (3.5)	0 (2.5)	1.2 (1.9)	5.0 (2.5)	4.0 (4.1)	3.7 (4.2)	5.6 (4.5)

The table shows the percentage of workplaces in each region experiencing any workplace change as part of their annual settlement.
Figures in parentheses are the annual average regional unemployment rate.

Table 4. Incidence Of Workplace Change By Sector

Year	Food, drink, tobacco	Chemicals	Metals	Mech. engineering	Instrument engineering	Textiles	Bricks	Paper & publishing
1979	22.1	22.2	21.6	30.4	31.4	5.8	26.6	46.3
1980	34.0	26.2	25.5	25.4	24.9	14.3	20.8	41.3
1981	32.3	19.7	26.3	20.6	22.5	15.7	18.2	25.4
1982	25.9	28.3	14.9	20.8	16.7	10.9	21.4	31.7
1983	23.7	15.9	28.6	19.6	19.5	9.5	15.0	33.3
1984	20.1	22.2	24.7	21.5	17.6	13.3	11.1	32.5
1985	25.7	21.8	26.8	19.0	17.7	14.4	20.3	32.3
1986	17.9	16.5	23.5	20.7	15.7	17.4	18.8	41.8

The table shows the percentage of workplaces in each sector experiencing any workplace change as part of their annual settlement

Table 4. Incidence Of Workplace Change By Sector, cont.

	Food, D, T	Chem	Metals	Mech. Eng	Instrum Eng	Textiles	Bricks	Paper & publish	Const'n	Trans& comms	Distrib trades	Insur'n	Prof & Sc'fic	Leisure	Misc Services
1987	22.7	14.0	26.7	21.2	14.5	17.5	30.6	51.8	100	26.3	15.4	5.6	9.5	0	0
1988	23.6	22.1	23.8	21.1	20.0	15.3	23.2	40.3	0	3.7	9.4	4.5	3.9	0	16.7
1989	20.8	21.6	23.4	27.5	17.3	18.5	22.6	29.8	25.0	19.6	1.8	4.0	9.8	0	0
1990	26.9	22.4	26.8	23.7	21.5	18.3	12.2	34.9	0	26.4	10.8	4.1	7.1	9.1	0
1991	10.4	14.8	9.0	12.1	8.3	8.0	14.6	16.5	0	17.5	5.6	1.2	2.2	6.7	21.4
1992	14.1	14.1	10.0	6.3	6.6	6.3	6.8	9.7	0	12.7	2.9	3.5	7.2	0	0
1993	11.5	11.3	5.9	9.0	4.1	20.6	5.7	6.1	0	22.8	8.8	0	6.5	7.1	4.8
1994	16.3	15.6	21.1	11.0	5.8	11.6	10.2	22.7	0	10.7	7.1	2.4	6.8	23.5	0
1995	10.9	10.7	14.3	8.6	5.8	7.7	1.5	7.3	0	7.3	8.1	3.3	1.6	0	4.8
1996	12.6	7.1	6.3	9.9	6.7	8.2	14.3	9.5	0	6.2	12.5	1.6	2.5	18.2	7.7
1997	9.3	6.3	11.0	8.0	8.0	3.8	8.1	6.0	0	16.0	7.4	1.8	2.6	0	0
1998	7.4	3.5	7.5	4.7	4.0	7.9	3.4	4.9	12.5	5.6	4.6	0	0.5	5.3	0
1999	6.1	2.2	6.9	4.8	3.9	10.3	7.3	14.3	0	10.2	4.0	2.0	1.7	0	0
2000	5.9	7.2	6.6	4.9	5.3	4.8	4.9	5.8	0	7.1	3.0	2	0.5	0	0

The table shows the percentage of workplaces in each sector experiencing any workplace change as part of their annual settlement

Table 5. Marginal Effects From Probit Regressions Of The Influences On The Introduction Of Workplace Change

Independent variables	Whole Sample	1979-1983	1987-91	1991-95	1997-2000
Manuals	0.028*** (0.005)	-0.008 (0.015)	0.086*** (0.013)	0.013 (0.008)	0.009 (0.006)
Non-manuals	-0.036*** (0.005)	-0.087*** (0.015)	-0.015 (0.012)	-0.033*** (0.008)	-0.012* (0.006)
Unionised	0.075*** (0.004)	0.111*** (0.014)	0.027*** (0.009)	0.041*** (0.007)	0.067*** (0.008)
Workplace change last year	0.191*** (0.008)	0.188*** (0.017)	0.203*** (0.015)	0.131*** (0.014)	0.073*** (0.015)
Emp' drop over last year (10% or more)	0.001 (0.005)	-0.031** (0.015)	-0.002 (0.011)	0.012* (0.007)	0.021*** (0.007)
Last time firm is in data set	-0.006 (0.007)	-0.028 (0.018)	-0.001 (0.017)	-0.003 (0.010)	-0.004 (0.08)
Interaction of the above	0.004 (0.015)	-0.003 (0.049)	-0.012 (0.031)	-0.006 (0.020)	-0.010 (0.015)
Up to 25 employees	-0.007 (0.006)	-0.040** (0.017)	-0.017 (0.015)	-0.002 (0.009)	0.015* (0.009)
26 - 50 employees	-0.008 (0.006)	-0.016 (0.017)	-0.026* (0.014)	-0.012 (0.009)	0.005 (0.009)
51 - 100 employees	-0.003 (0.006)	-0.014 (0.017)	0.000 (0.014)	0.008 (0.010)	0.001 (0.008)
201-500 employees	0.009 (0.007)	0.023 (0.018)	0.014 (0.015)	-0.005 (0.009)	-0.011 (0.007)
More than 500 employees	0.015** (0.007)	0.015 (0.020)	0.040** (0.017)	-0.004 (0.010)	-0.003 (0.008)
Scotland	-0.000 (0.007)	0.009* (0.022)	-0.004 (0.017)	0.025** (0.013)	-0.000 (0.009)
North East	0.020** (0.010)	0.007 (0.025)	0.039* (0.022)	0.014 (0.014)	0.006 (0.013)
Yorkshire	-0.029*** (0.007)	-0.046** (0.020)	-0.047*** (0.016)	-0.021* (0.010)	-0.003 (0.010)

Table 5. Marginal Effects From Probit Regressions Of The Influences On The Introduction Of Workplace Change, continued

East Midlands	-0.039*** (0.007)	-0.045** (0.021)	-0.067*** (0.016)	-0.022* (0.011)	-0.009 (0.009)
East Anglia	-0.039*** (0.009)	-0.076** (0.029)	-0.079*** (0.017)	-0.024 (0.013)	-0.005 (0.012)
South East	-0.020*** (0.006)	-0.024 (0.017)	-0.040*** (0.014)	-0.014 (0.010)	-0.021** (0.007)
South West	-0.026** (0.008)	-0.061*** (0.021)	-0.040** (0.016)	-0.007 (0.012)	-0.013 (0.009)
West Midlands	0.001 (0.008)	0.001 (0.021)	-0.010 (0.017)	0.004 (0.012)	0.007 (0.010)
Wales	0.003 (0.009)	0.010 (0.026)	0.005 (0.022)	0.002 (0.014)	-0.000 (0.012)
Food, drink & tobacco	0.021* (0.012)	0.036 (0.030)	-0.009 (0.025)	0.033 (0.024)	-0.004 (0.012)
Chemicals	-0.000 (0.010)	-0.012 (0.027)	-0.022 (0.022)	0.049** (0.023)	-0.017* (0.008)
Metals	0.015 (0.012)	-0.005 (0.031)	-0.011 (0.027)	0.047** (0.027)	-0.009 (0.011)
Mechanical engineering	0.018* (0.010)	0.023 (0.026)	0.009 (0.023)	0.021 (0.019)	-0.010 (0.009)
Instrument engineering	0.004 (0.011)	0.012 (0.028)	-0.014 (0.024)	-0.003 (0.018)	-0.009 (0.010)
Textiles	-0.024** (0.011)	-0.099*** (0.024)	-0.041 (0.023)	0.025 (0.025)	-0.011 (0.011)
Paper & publishing	0.076*** (0.015)	0.109*** (0.035)	0.088*** (0.035)	0.045* (0.028)	-0.001 (0.014)
Construction	-.080** (0.020)	N/a	-0.032 (0.076)	+ 0.057** (0.029)	-0.007 (0.025)
Transport & Communications	0.005 (0.015)	N/a	0.027 (0.036)		0.010 (0.016)
Distributive Trades	-0.044*** (0.011)	N/a	-0.089*** (0.018)	0.015 (0.023)	0.007 (0.015)
Insurance	-0.088*** (0.008)	N/a	-0.114*** (0.015)	-0.034 (0.017)	-0.030** (0.008)

Table 5. Marginal Effects From Probit Regressions Of The Influences On The Introduction Of Workplace Change, continued

Prof. Services	-0.062***	N/a	-0.080***	0.016	-0.036***
	(0.009)		(0.020)	(0.020)	(0.007)
Leisure Services	-0.059**	N/a	-0.123***	0.038	0.001
	(0.020)		(0.020)	(0.047)	(0.027)
Misc. Services	-0.061**	N/a	-0.078	0.026	-0.019
	(0.021)		(0.040)	(0.047)	(0.022)
Predicted probability at means	0.120	0.218	0.146	0.072	0.039
No. of Obs.	30041	6390	6924	8317	6474
Pseudo R"	11.05%	6.44	12.56	9.29	11.76
Log likelihood	-11103.761	-3242.4812	-2809.4129	-2264.5499	1253.8865

*indicates significance at the 10% level; ** indicates significance at the 5% level; *** indicates significance at the 1% level.

+ represents merged industry dummies to ensure cell sizes: transport & distribution. The default categories are 101 to 200 employees; brick industry; mixed settlement groups; the North West.

Table 6. Marginal Effects From Probit Estimates Of Influences On The Introduction Of The Separate Constituents Of Workplace Change

Independent variables	Flexible working practices 1985-2000	Shift working 1979-2000	End of restrictive practices 1979-2000	New technology 1979-2000	Other productivity agreements 1979-97
Non-manuals	-0.012*** (0.004)	-0.009*** (0.002)	-0.013*** (0.003)	-0.006** (0.003)	-0.026*** (0.004)
Manuals	0.019*** (0.004)	0.001 (0.001)	0.015*** (0.002)	-0.003 (0.003)	0.010*** (0.004)
Unionised	0.023*** (0.003)	0.004*** (0.001)	0.025*** (0.002)	0.023*** (0.002)	0.049*** (0.003)
Workplace Change Last Year	0.068*** (0.006)	0.019*** (0.003)	0.048*** (0.004)	0.076*** (0.005)	0.092*** (0.006)
Emp' drop over last year (10% or more)	0.011*** (0.004)	0.001 (0.001)	0.005** (0.002)	-0.006** (0.002)	-0.007* (0.004)
Last time firm is in data set	-0.002 (0.005)	-0.002 (0.002)	0.003 (0.003)	0.002 (0.004)	-0.008 (0.005)
Interaction of the above	0.009 (0.011)ˋ	0.001 (0.005)	0.009 (0.008)	0.005 (0.009)	0.010 (0.013)
Up to 25 employees	0.010** (0.005)	-0.004** (0.002)	-0.009*** (0.003)	-0.001 (0.003)	-0.012** (0.005)
26 - 50 employees	0.006 (0.005)	-0.003 (0.002)	-0.008*** (0.003)	-0.007** (0.003)	-0.005 (0.005)
51 - 100 employees	0.010** (0.005)	-0.000 (0.002)	-0.003 (0.003)	-0.004 (0.003)	0.001 (0.005)
201-500 employees	0.014*** (0.005)	0.002 (0.002)	0.004 (0.003)	0.004 (0.003)	0.008* (0.005)
More than 500 employees	0.014*** (0.006)	0.001 (0.002)	0.012*** (0.004)	0.008** (0.004)	0.016*** (0.006)
Scotland	-0.006 (0.005)	0.001 (0.002)	0.007** (0.004)	0.011** (0.005)	-0.010* (0.005)
North East	0.004 (0.006)	0.001 (0.003)	0.007 (0.005)	0.011** (0.006)	0.003 (0.007)
Yorkshire	-0.011** (0.005)	-0.002 (0.002)	-0.009** (0.003)	-0.007* (0.004)	-0.022*** (0.005)

Table 6. Marginal Effects From Probit Estimates Of Influences On The Introduction Of The Separate Constituents Of Workplace Change, continued

East Midlands	-0.015**	-0.007***	-0.009**	-0.004	-0.025***
	(0.005)	(0.002)	(0.003)	(0.004)	(0.005)
East Anglia	-0.015**	-0.007**	-0.008	-0.008	-0.037***
	(0.006)	(0.002)	(0.004)	(0.005)	(0.005)
South East	-0.010**	-0.003*	-0.002	-0.006*	-0.013***
	(0.004)	(0.002)	(0.003)	(0.003)	(0.004)
South West	-0.016***	-0.002	-0.006*	-0.004	-0.019***
	(0.005)	(0.002)	(0.003)	(0.004)	(0.005)
West Midlands	-0.004	-0.001	0.006	0.006	0.001
	(0.005)	(0.002)	(0.004)	(0.004)	(0.005)
Wales	-0.006	0.003	0.005	0.015***	-0.005
	(0.006)	(0.003)	(0.005)	(0.006)	(0.006)
Food, drink & tobacco	0.005	0.006	-0.001	0.003	0.006
	(0.009)	(0.004)	(0.005)	(0.006)	(0.008)
Chemicals	-0.005	0.002	-0.005	0.000	-0.001
	(0.007)	(0.004)	(0.004)	(0.005)	(0.008)
Metals	0.010	0.001	0.006	-0.001	0.016*
	(0.010)	(0.004)	(0.006)	(0.006)	(0.010)
Mechanical engineering	0.002	0.004	0.000	0.001	0.012
	(0.007)	(0.003)	(0.004)	(0.005)	(0.008)
Instrument engineering	-0.003	0.001	-0.006	-0.006	0.012
	(0.008)	(0.003)	(0.004)	(0.005)	(0.009)
Textiles	0.016*	0.001	-0.018***	-0.011*	-0.021**
	(0.011)	(0.004)	(0.003)	(0.005)	(0.007)
Paper & publishing	0.030***	0.003	0.028***	0.019***	0.049***
	(0.012)	(0.004)	(0.008)	(0.008)	(0.013)
Construction	-0.026	-0.004	-0.021	-0.020	-0.048*
	(0.013)	(0.008)	(0.007)	(0.010)	(0.013)
Transport & Communications	0.039***	0.000	-0.009	-0.021***	-0.030***
	(0.014)	(0.005)	(0.005)	(0.004)	(0.008)
Distributive Trades	-0.003	-0.005	-0.020***	-0.020***	-0.046***
	(0.009)	(0.003)	(0.003)	(0.004)	(0.005)

Table 6. Marginal Effects From Probit Estimates Of Influences On The Introduction Of The Separate Constituents Of Workplace Change, continued

Insurance	-0.031***	-0.011**	-0.026***	-0.030***	-0.054***
	(0.006)	(0.002)	(0.002)	(0.003)	(0.004)
Prof. Services	-0.015**	-0.010***	-0.015***	-0.026***	-0.035***
	(0.007)	(0.002)	(0.004)	(0.003)	(0.007)
Leisure Services	-0.005	N/a	-0.024*	-0.030**	-0.044**
	(0.016)		(0.005)	(0.005)	(0.011)
Misc. Services	-0.007	N/a	-0.015	0.006	-0.019
	(0.017)		(0.010)	(0.017)	(0.022)
Leisure & Misc combined	N/a	-0.008	N/a	N/a	N/a
		(0.004)			
Predicted probability (at means of vars)	0.044	0.012	0.028	0.034	0.061
Pseudo R^2	7.64%	7.25%	12.42%	9.32%	10.73%
No. of Obs.	22389	30041	30041	30041	26476
Log likelihood	-4449.1857	-2487.7099	-4756.314	-5079.5695	-6772.5798

* indicates significance at the 10% level; ** indicates significance at the 5% level; *** indicates significance at the 1% level. The defaults are 101 to 200 employees; brick industry; mixed settlement groups; the North West.

Table 7. Ordered Probit Estimates of the Influences Affecting the Number of Individual Constituents of Workplace Change Which Were Introduced in any Year

Independent variables	Whole Sample	1979-1983	1987-91	1991-95	1997-2000
Up to 25 employees	-0.183* (0.031)	-0.165*** (0.059)	-0.097 (0.063)	-0.017 (0.066)	0.179** (0.088)
26 - 50 employees	-0.059** (0.032)	-0.096* (0.058)	-0.096 (0.065)	-0.093 (0.072)	0.048 (0.091)
51 - 100 employees	-0.011 (0.030)	-0.062 (0.058)	0.031 (0.060)	0.068 (0.066)	0.017 (0.089)
201-500 employees	0.062** (0.030)	0.083 (0.056)	0.076 (0.060)	-0.004 (0.070)	-0.113 (0.096)
More than 500 employees	0.102*** (0.032)	0.063 (0.063)	0.174*** (0.061)	0.030 (0.071)	0.015 (0.094)
Scotland	0.014 (0.036)	0.058 (0.068)	-0.030 (0.074)	0.184** (0.078)	-0.025 (0.104)
North East	0.092** (0.041)	0.107 (0.082)	0.080 (0.079)	0.038 (0.089)	0.014 (0.130)
Yorkshire	-0.160*** (0.040)	-0.157** (0.069)	-0.265*** (0.083)	-0.0177* (0.092)	-0.076 (0.116)
East Midlands	-0.207*** (0.044)	-0.116 (0.077)	-0.365*** (0.096)	-0.204** (0.100)	-0.140 (0.122)
East Anglia	-0.223*** (0.056)	-0.266** (0.117)	-0.481*** (0.117)	-0.231* (0.119)	-0.100 (0.145)
South East	-0.103*** (0.032)	-0.042 (0.058)	-0.229*** (0.065)	-0.122* (0.074)	-0.302*** (0.109)
South West	-0.137*** (0.042)	-0.168** (0.081)	-0.246*** (0.082)	-0.110 (0.091)	-0.198 (0.129)
West Midlands	0.020 (0.036)	0.069 (0.067)	-0.067 (0.075)	0.006 (0.083)	0.038 (0.100)
Wales	0.031 (0.045)	0.131 (0.084)	-0.076 (0.088)	-0.031 (0.098)	-0.010 (0.140)
Food, drink & tobacco	0.073 (0.052)	0.073 (0.091)	-0.035 (0.108)	0.231* (0.131)	-0.062 (0.148)

Table 7. Ordered Probit Estimates of the Influences Affecting the Number of Individual Constituents of Workplace Change Which Were Introduced in any Year, continued

Chemicals	-0.010	-0.061	-0.093	0.297**	-0.228*
	(0.049)	(0.090)	(0.101)	(0.118)	(0.135)
Metals	0.080	-0.004	-0.062	0.339**	-0.157
	(0.056)	(0.100)	(0.116)	(0.133)	(0.145)
Mechanical engineering	0.073	0.070	0.031	0.155	-0.177
	(0.046)	(0.082)	(0.095)	(0.115)	(0.124)
Textiles	-0.132**	-0.392***	-0.190	0.159	-0.178
	(0.059)	(0.108)	(0.120)	(0.140)	(0.156)
Paper & publishing	0.311***	0.382***	0.263**	0.306**	-0.024
	(0.054)	(0.095)	(0.110)	(0.139)	(0.159)
Construction	-0.554**	N/a	-0.191	-7.287***	-0.058
	(0.234)		(0.366)	(0.136)	(0.355)
Transport & Communications	-0.008	N/a	0.104	0.384***	0.089
	(0.071)		(0.136)	(0.137)	(0.153)
Distributive Trades	-0.283***	N/a	-0.536***	0.075	0.049
	(0.071)		(0.128)	(0.140)	(0.153)
Insurance	-0.683***	N/a	-0.741***	-0.356**	-0.615**
	(0.097)		(0.152)	(0.178)	(0.242)
Prof. Services	-0.374***	N/a	-0.430***	0.119	-0.628***
	(0.065)		(0.134)	(0.127)	(0.164)
Leisure Services	-0.414**	N/a	-0.893***	0.203	-0.069
	(0.162)		(0.327)	(0.242)	(0.0297)
Misc. Services	-0.262	N/a	-0.388	0.295	-0.168
	(0.210)		(0.297)	(0.268)	(0.479)
Manuals	0.139***	-0.036	0.353***	0.085	0.090
	(0.024)	(0.050)	(0.050)	(0.055)	(0.069)
Non-manuals	-0.183***	-0.321***	-0.080	-0.238***	-0.141*
	(0.026)	(0.054)	(0.054)	(0.057)	(0.075)
Unionised	0.354***	0.438***	0.120***	0.253***	0.587***
	(0.019)	(0.054)	(0.036)	(0.042)	(0.057)
Workplace Change Last Year	0.678***	0.519***	0.667***	0.653***	0.548***
	(0.022)	(0.043)	(0.042)	(0.052)	(0.076)

Table 7. Ordered Probit Estimates of the Influences Affecting the Number of Individual Constituents of Workplace Change Which Were Introduced in any Year, continued

Emp' drop over last year (10% or more)	0.017 (0.023)	-0.062 (0.051)	-0.005 (0.044)	0.088* (0.048)	0.202*** (0.061)
Last time firm is in data set	-0.029 (0.034)	-0.112* (0.063)	-0.027 (0.071)	-0.013 (0.075)	-0.063 (0.096)
Interaction of the above	0.069 (0.074)	-0.016 (0.162)	0.034 (0.138)	-0.017 (0.156)	-0.042 (0.218)
No. of Obs.	30041	6390	6924	8317	6474
Log likelihood	-15342.816	-4504.9944	-3929.5069	-2904.5411	1561.1264
Pseudo R²	8.46%	5.22%	9.60%	7.92%	9.72

* indicates significance at the 10% level; ** indicates significance at the 5% level; *** indicates significance at the 1% level. The default categories are 101 to 200 employees; brick industry; mixed settlement groups; the North West.

Table 8a. Benchmark Effects: Probability Of Multiple Changes: 1979-2000

	One change	Two changes	Three changes	Four changes
Type a	11.6	4.3	1.3	0.3
Type b	10.5	3.7	1.1	0.3
Type c	6.1	1.8	0.4	0.1

Table shows the percentage probability that a workplace of type a, b and c will undergo one or more workplace changes in any year.

Type a "MechEng": mechanical engineering, in West Midlands, 26-50 employees, unionised, manual group. Type b "TransDib": transport & distribution, in East Anglia, 201-500 employees, unionised, mixed occupational group. Type c "Bricks": brick making plant, in South West, <26 employees, non-union, non-manual workers.

Table 8b. Benchmark Effects: Probability Of Multiple Changes

Period	One change	Two changes	Three or more changes
1979-1983			
MechEng (a)	16.8	6.3	2.3
Bricks (c)	8.1	2.1	0.5
1987-1991			
MechEng (a)	23.1	16.9	15.0
TransDib (b)	10.6	3.9	1.5
1991-1995			
MechEng (a)	16.3	9.1	6.0
TransDib (b)	8.4	3.4	1.5
1996-2000			
MechEng (a)	15.7	8.4	5.1
TransDib (b)	4.5	1.4	0.5

Table shows the percentage probability that a workplace of type a, b and c will undergo one or more workplace changes in any year.

Type a "MechEng": mechanical engineering, in West Midlands, 26-50 employees, unionised, manual group. Type b "TransDib": transport & distribution, in East Anglia, 201-500 employees, unionised, mixed occupational group. Type c "Bricks": brick making plant, in South West, <26 employees, non-union, non-manual workers.

Table 9. Correlations Between Workplace Change And Changes To Hours And Holidays

Time period	Wages	Holidays	Hours
1979-2000	0.049***	0.075***	0.056***
1979-1983	0.056***	0.031**	0.012
1987-1991	0.066***	0.014	0.017
1991-1995	0.059***	0.014	0.040***
1996-2000	0.023*	0.062***	0.104***

The table presents correlation coefficients and * indicates significance at the 10% level; ** indicates significance at the 5% level; *** indicates significance at the 1% level. The wage variable used is a dummy which indicates whether the settlement group received a real wage increase from as part of the settlement that introduced workplace change. The variables for hours and holidays are also dummies indicating there was change in these areas.

Table 10. OLS Estimates of Real Wage Increases

Independent variables	Whole Sample	1979-1983	1987-91	1991-95	1996-2000
Non-manuals	0.443*** (0.042)	0.819*** (0.137)	0.104 (0.084)	0.103* (0.055)	0.257*** (0.056)
Manuals	0.272*** (0.043)	0.481*** (0.135)	-0.085 (0.082)	-0.047 (0.055)	-0.039 (0.057)
Unionised	-0.543*** (0.032)	-0.673*** (0.134)	0.159*** (0.059)	-0.063 (0.044)	-0.026 (0.046)
Workplace change this year	0.293*** (0.051)	0.293** (0.112)	0.715*** (0.082)	0.597*** (0.085)	0.442*** (0.084)
Workplace change last year	-0.003 (0.048)	0.519*** (0.125)	-0.285*** (0.080)	-0.293*** (0.064)	-0.105 (0.082)
10% drop in employment last year	-0.008 (0.036)	-0.094 (0.128)	-0.237*** (0.068)	-0.224*** (0.048)	-0.100* (0.056)
Last time in dataset	-0.379*** (0.060)	-0.598*** (0.178)	0.026 (0.136)	-0.254*** (0.086)	-0.444*** (0.071)
Last time in & big fall in employment	0.150 (0.124)	0.104 (0.413)	-0.399* (0.233)	-0.003 (0.182)	0.148 (0.186)
No. of Obs.	30017	6386	6924	8317	6464
Constant	0.032	-1.639	-0.167	0.304**	0.563***
Adjusted R^2	5.24%	6.03%	5.54%	3.77	8.25%

* indicates significance at the 10% level; ** indicates significance at the 5% level; *** indicates significance at the 1% level. The default categories are 101 to 200 employees; brick industry; mixed settlement groups; the North West. Regional, sectoral and size controls are used: full results are reported in appendix C3.

This table presents results for a regression on real wages.

Table 11. Marginal Effects From Probit Regressions On Changes To Working Hours

Independent variables	Whole Sample	1979-1983	1987-91	1991-95	1996-2000
Manuals	-0.013*** (0.003)	0.003 (0.012)	0.000 (0.007)	-0.002 (0.003)	-0.000 (0.002)
Non-manuals	-0.011*** (0.003)	0.003 (0.012)	-0.002 (0.007)	0.002 (0.003)	0.002 (0.002)
Unionised	0.043*** (0.003)	0.005 (0.012)	0.050*** (0.005)	0.015*** (0.003)	0.010*** (0.002)
Workplace change	0.018*** (0.004)	0.011 (0.010)	0.013* (0.008)	0.011** (0.005)	0.025*** (0.009)
Workplace change last year	-0.005* (0.003)	-0.017 (0.011)	-0.014** (0.007)	0.004 (0.004)	0.005 (0.004)
10% drop in employment last year	-0.011*** (0.003)	-0.041*** (0.010)	0.008 (0.007)	0.010*** (0.004)	-0.003* (0.002)
Last time in data set	0.003 (0.004)	-0.005 (0.014)	0.018* (0.011)	0.003 (0.005)	0.002 (0.003)
Last time in and big fall in emp.	0.012 (0.011)	0.089* (0.053)	0.004 (0.018)	-0.006 (0.006)	dropped
No. of Obs.	30041	6390	6924	8317	6034
Log Likelihood	-5570.1394	-2343.8887	1458.6219	-739.5890	-319.7646
Pseudo R^2	5.33%	0.90%	4.59%	5.98%	15.21%
Predicted probability (at sample means)	0.040	0.120	0.050	0.015	0.005

* indicates significance at the 10% level; ** indicates significance at the 5% level; *** indicates significance at the 1% level. The default categories are 101 to 200 employees; brick industry; mixed settlement groups; the North West. Regional, sectoral and size controls are used: full results are reported in appendix C4.

Table 12. The Marginal Effects From Probit Regressions On Changes To Holidays

Independent variables	Whole Sample	1979-1983	1987-91	1991-95	1996-2000
Manuals	-0.014***	-0.007	-0.007	-0.003	0.003
	(0.004)	(0.016)	(0.008)	(0.005)	(0.005)
Non-manuals	-0.030***	-0.040**	-0.008	-0.005	-0.002
	(0.004)	(0.016)	(0.008)	(0.005)	(0.005)
Unionised	0.081***	0.087***	0.013**	0.017***	0.033***
	(0.004)	(0.015)	(0.006)	(0.004)	(0.007)
Workplace change	0.035***	0.027**	0.014	0.002	0.035***
	(0.005)	(0.013)	(0.009)	(0.006)	(0.012)
Workplace change last year	-0.009*	-0.055***	-0.006	0.013**	-0.002
	(0.005)	(0.014)	(0.008)	(0.007)	(0.007)
10% drop in employment last year	-0.023***	-0.037**	-0.004	-0.001	-0.003
	(0.004)	(0.015)	(0.007)	(0.004)	(0.004)
Last time in data set	-0.001	0.014	-0.009	-0.003	-0.007
	(0.006)	(0.020)	(0.011)	(0.006)	(0.005)
Last time in and big fall in emp.	0.011	0.086	0.010	-0.010	0.003
	(0.014)	(0.057)	(0.024)	(0.010)	(0.016)
No. of Obs.	30041	6390	6924	8317	6474
Log Likelihood	-9240.9211	-3444.2418	1745.4826	-1152.1208	-889.3860
Pseudo R^2	7.08%	3.11%	6.97%	6.19%	9.27%
Predicted probability (at sample means)	0.087	0.237	0.064	0.027	0.025

* indicates significance at the 10% level; ** indicates significance at the 5% level; *** indicates significance at the 1% level. The defaults are 101 to 200 employees; brick industry; mixed settlement groups; the North West. Regional, sectoral and size controls are used: full results are reported in appendix C6.

Table 13. OLS Estimates of Real Wage Increases

Independent variables	Whole Sample	1979-1983	1987-91	1991-95	1996-2000
Non-manual	0.444*** (0.042)	0.820*** (0.137)	0.106 (0.084)	0.103* (0.055)	0.257*** (0.056)
Manual	0.270*** (0.043)	0.480*** (0.135)	-0.090 (0.082)	-0.049 (0.056)	-0.041 (0.057)
Unionised	-0.543*** (0.032)	-0.673*** (0.136)	0.157*** (0.059)	-0.062 (0.044)	-0.025 (0.046)
1 type of change	0.218*** (0.061)	0.300** (0.131)	0.586*** (0.098)	0.462*** (0.100)	0.466*** (0.100)
2 types of change	0.370*** (0.098)	0.219 (0.206)	0.873*** (0.140)	0.917*** (0.173)	0.500*** (0.171)
3 types of change	0.560*** (0.140)	0.434 (0.315)	1.001*** (0.198)	0.663*** (0.245)	0.112 (0.254)
Workplace change last year	-0.009 (0.047)	0.519*** (0.125)	-0.292*** (0.080)	-0.301*** (0.063)	-0.102 (0.082)
Big fall in employment	-0.009 (0.036)	-0.095 (0.128)	0.237*** (0.068)	-0.224*** (0.048)	-0.100* (0.056)
Last time in data set	-0.379*** (0.060)	-0.596*** (0.177)	0.030 (0.136)	-0.255*** (0.086)	-0.445*** (0.071)
Big fall in emp & last time in dataset	0.145 (0.124)	0.103 (0.413)	-0.412* (232)	-0.001 (0.182)	0.150 (0.185)
Constant	0.034	-1.639***	-0.168	0.307**	0.566***
No. of Obs.	30017	6386	6924	8317	6464
Adjusted R^2	5.27%	6.04%	5.62%	3.86	8.27%

* indicates significance at the 10% level; ** indicates significance at the 5% level; *** indicates significance at the 1% level. The defaults are 101 to 200 employees; brick industry; mixed settlement groups; the North West. Regional, sectoral and size controls are used: full results are reported in appendix C8.

Table 14. The Marginal Effects from Probit Regressions on Changes to Working Hours

Independent variables	Whole Sample	1979-1983	1987-91	1991-95	1996-2000
Manuals	-0.013*** (0.003)	0.003 (0.012)	0.000 (0.007)	-0.002 (0.003)	-0.000 (0.002)
Non-manuals	-0.011*** (0.003)	0.004 (0.012)	-0.002 (0.007)	0.002 (0.003)	0.002 (0.002)
Unionised	0.043*** (0.003)	0.005 (0.011)	0.050*** (0.005)	0.015*** (0.003)	0.010*** (0.004)
One workplace change	0.017*** (0.004)	0.010 (0.012)	0.012 (0.010)	0.014*** (0.007)	0.012** (0.007)
Two workplace changes	0.016*** (0.007)	0.000 (0.018)	0.010 (0.014)	-0.004 (0.007)	0.051*** (0.024)
Three workplace changes	0.036*** (0.011)	0.042 (0.031)	0.027 (0.022)	0.023* (0.018)	0.069*** (0.038)
Workplace change last year	-0.006* (0.003)	-0.017 (0.011)	-0.015** (0.007)	0.004 (0.004)	0.005 (0.004)
10% drop in employment last year	-0.011*** (0.003)	-0.041*** (0.010)	0.008 (0.007)	0.010*** (0.004)	-0.003* (0.002)
Last time in data set	0.003 (0.004)	-0.005 (0.014)	0.019* (0.012)	0.003 (0.005)	0.002 (0.003)
Last time in and big fall in emp.	0.011 (0.011)	0.088* (0.053)	0.004 (0.018)	-0.006 (0.006)	dropped
No. of Obs.	30041	6390	6924	8317	6034
Log Likelihood	-5568.6163	-2343.116	1458.3594	-737.8367	-316.8158
Pseudo R^2	5.36%	0.92%	4.60%	6.21%	15.99%
Predicted probability (at sample means)	0.040	0.119	0.050	0.015	0.006

* indicates significance at the 10% level; ** indicates significance at the 5% level; *** indicates significance at the 1% level. The default categories are 101 to 200 employees; brick industry; mixed settlement groups; the North West. Regional, sectoral and size controls are used: full results are reported in appendix C9 with probit coefficients in C10.

Table 15. The Marginal Effects from Probit Regressions on Concessions on Holidays

Independent variables	Whole Sample	1979-1983	1987-91	1991-95	1996-2000
Manuals	-0.014***	-0.007	-0.007	-0.003	0.003
	(0.004)	(0.016)	(0.008)	(0.005)	(0.005)
Non-manuals	-0.030***	-0.040**	-0.008	-0.005	-0.002
	(0.004)	(0.016)	(0.008)	(0.005)	(0.005)
Unionised	0.081***	0.087***	0.013**	0.017***	0.033***
	(0.004)	(0.015)	(0.006)	(0.004)	(0.007)
One workplace change	0.042***	0.040**	0.014	0.009	0.053***
	(0.007)	(0.016)	(0.011)	(0.008)	(0.017)
Two workplace changes	0.032***	0.017	0.024	-0.008	0.014
	(0.010)	(0.024)	(0.017)	(0.009)	(0.017)
Three workplace changes	0.007	-0.035	-0.005	-0.014	-0.013
	(0.013)	(0.033)	(0.021)	(0.011)	(0.013)
Workplace change last year	-0.008*	-0.054***	-0.005	0.014**	-0.002
	(0.005)	(0.014)	(0.008)	(0.007)	(0.007)
10% drop in employment last year	-0.023***	-0.037**	-0.004	-0.002	-0.003
	(0.004)	(0.015)	(0.007)	(0.004)	(0.004)
Last time in data set	-0.001	0.014	-0.009	-0.003	-0.007
	(0.006)	(0.020)	(0.011)	(0.006)	(0.005)
Last time in and big fall in emp.	0.012	0.086	0.011	-0.010	0.004
	(0.014)	(0.057)	(0.024)	(0.010)	(0.017)
No. of Obs.	30041	6390	6924	8317	6474
Log Likelihood	-9237.7473	-3442.1748	1744.8049	-1150.5987	-886.6084
Pseudo R^2	7.11%	3.17%	7.00%	6.31%	9.55%
Predicted probability (at sample means)	0.087	0.237	0.064	0.027	0.025

* indicates significance at the 10% level; ** indicates significance at the 5% level; *** indicates significance at the 1% level. The default categories are 101 to 200 employees; brick industry; mixed settlement groups; the North West. Regional, sectoral and size controls are used: full results are reported in appendix C11, with probit coefficients in C12.

Chapter 5. Conclusions

Introduction

This thesis has explored the concepts of exit and of voice in UK workplaces using both statistical and case study techniques. Both longitudinal and cross-sectional data sets are employed to develop a picture of changing voice mechanisms within British industrial relations. The thesis makes a major contribution in terms of the rich data sets which are used, focusing on relatively unexplored areas of the labour market: low paid workers and (generally) service sector workplaces, employing large proportions of women and ethnic minorities. The empirical results constitute another major contribution of the thesis. In using such unique data sets to explore the hypotheses, a number of the stylised facts of satisfaction, absenteeism and labour turnover are challenged. Challenging stylised labour market facts is one of the key objectives of empirical work. The distinctiveness of the findings of this thesis indicates the value of using less commonly exploited sources and suggests avenues for future research.

Summary

In the examination of voice in UK workplaces it was hypothesised that direct, individual forms of involvement would have replaced collective fora; that individualistic voice channels would be related to higher levels of job satisfaction; and that collective channels, in the form of union recognition, would be associated with lower quitting rates. The first hypothesis was explored using WIRS data for 1980, 1990, and 1998. Direct communication and involvement mechanisms have become more common. Despite the fall in trade union recognition and this growth of direct communication channels, more than half the surveyed workplaces still had access to a form of collective voice, be it trade union, JCC or health and safety committee, though the proportion has fallen over time. However, WIRS data show that workplaces tend to use both types of voice channel or none at all. Such a finding corresponds to that of Tillsley (1994), who suggested that employers' use of

voice was becoming more sophisticated, with different mechanisms being used for distinct purposes. Therefore the first hypothesis is not confirmed.

The subsequent analysis of voice used a previously unexplored data set, based on five national companies in hotels, quick service restaurants, food retailing, leisure clubs and food manufacturing, all of whom offered relatively low wages. This data set is interesting not merely for its focus on services and low paid employees, it also covers a predominantly female pool of labour, with significant numbers of ethnic minorities and part-time students. The common finding of the multitude of existing studies of the relationship between union membership and satisfaction is that unionised workers are less content. Most researchers concur with Bender and Sloane (1998) that the process of unionisation leads to an emphasis on the negative aspects of work and the workplace, which impacts on the industrial relations climate. These data generate results which contradict extant findings regarding the relationships between collective voice and both job satisfaction and quitting. With respect to the second hypothesis, employees in workplaces with trade union recognition or presence are not less satisfied than those in establishments without collective voice.

The body of evidence on the relationship between trade unions and labour turnover is compelling: involuntary turnover is reduced by unions' "dual authority" (Freeman: 1980, p647), whilst voluntary turnover is lessened through wage premia, fringe benefits and grievance protection. Using a subset of the same data, focusing on branches of the retail and hotel chain, we find that quitting is more common in plants with union recognition, disproving the third hypothesis. Recent studies have shown that this negative union association relies upon union strength (Wooden and Baker: 1994), so in a period when union membership is declining and their influence is perceived as weak, it may not be surprising to find no significant relationship between union recognition and quits. However, this positive relationship defies explanation and reinforces the importance of testing stylised facts on new sources of data, covering less thoroughly researched types of employee.

The case study analysis of Bun Factory depicts a low paying workplace with extremely high rates of absence across a predominantly male, ethnic workforce. Examining the pattern of time off by demographic and job characteristics, a number of the established facts about absenteeism were challenged. In previous work women have been shown to take more time off due to poorer health and childcare commitments, young workers were absent more, whilst those living further away were more likely to miss work. This study contradicts these findings: women, young staff and those living far from the plant take fewer days off than males, older workers and those living close by; and those promoted during the year of analysis are much more likely to be off. An examination of employee satisfaction provides another distinctive result: workers were better satisfied with contextual aspects of the job, such as relationships, than content-related aspects including the challenging nature of the post. This directly contradicts extant theoretical and empirical work.

There are two responses employees can make when faced with a deterioration of conditions or they perceive the need for organisational change. Workers can chose to make suggestions or demands, use voice, or they can exit the employment relationship permanently by quitting. The chapter next investigates whether absence is being used as a form of voice, given the lack of other formal channels at Bun Factory, or a form of partial exit. To see whether absence represents voice, we analyse longitudinal absence patterns by skill group against a background of discrete, skill-related improvements to pay and working conditions. Overall, absence shows a slight downward trend over the year under analysis, though it is only weakly related to the staged improvements offered to employees. This is inconsistent with the argument that absence is used as a form of voice. It then remains to pursue the possibility that absence is a form of exit or, as has been suggested, a distinct form of behaviour. A significantly positive relationship is found when using lagged absence as an explanatory variable in a quits equation, implying that employees with a tendency to be absent in one year are likely to progress to quitting the following year. This result is therefore consistent with the interpretation of absence as a form of exit. Such a conclusive finding makes a major contribution to the literature on absence and its position on the exit-voice continuum.

The CBI databank is an established source of longitudinal information on individual settlement groups in the private sector. These data are used to explore the linking of workplace change to establishments' annual settlements, and to look at the issue of compensation for the extra effort associated with workplace change. The CBI data has the advantage of reporting on year-on-year changes to the position of groups of workers, so a number of unobserved characteristics are held constant. We hypothesise that external pressures and technical change would ensure that settlement groups continue to experience high levels of workplace change at the end of the 1990s. The greater effort levels associated with workplace changes make compensatory remuneration vital if the wage-effort balance is to be retained, ceteris paribus.

An initial study of WIRS data indicates that workplace change remained common over the late 1990s, a pattern supported by Machin's (2001) analysis of technical change, but that union representatives have seen the scope of their influence decline even where they retained recognition rights. Employees with non-union representation or no representation at all are even less likely to exert influence, particularly during periods of low demand or high unemployment. In relation to the first hypothesis, CBI data show that settlements become less commonly associated with forms of workplace change over the twenty-year period of analysis, but that union recognition is consistently, positively associated with change. Consistent with our second hypothesis, compensatory remuneration continues to be paid in the year workers experience changes to their working pratices. Aside from the initial recession of the early 1980s, trade union recognition remains positively associated with the ability to enjoy compensation for change. Green (1985; 1997) emphasised the need to consider remuneration in a broader sense than mere pay, so our analysis looks at changes to working hours and holidays as well as pay increases. Over the 1990s, as inflation has remained low and stable, change is more likely to be accompanied by shorter hours and longer holidays than above average pay rises. We conclude that whilst a declining proportion of change is now tied to the annual settlement which indicates a limit to union and employee influence, the association between recognition and higher rewards is consistent with unions' ability to link change and the annual settlement rather than a greater need for change in unionised groups.

Contribution

The theme of employee representation runs through the three substantive chapters. Over the period covered by the thesis, trade union membership and recognition has fallen in the UK. The CBI data set, used to analyse influence over workplace change, mirrors the wider economy in that trade union recognition has fallen significantly over the last twenty years. However, the CBI dataset enables us to observe the parallel decline in the ability to link workplace change with the annual settlement. A union premium in the form of compensation for workplace change is still evident, which is consistent with the view that trade unions retain some power.

The establishment chosen for our case study, Bun Factory, suffered high levels of absenteeism and labour turnover. Satisfaction levels with aspects of work at Bun Factory and the other four companies examined were surprisingly high, with the exception of wages which were viewed as poor. Comparisons with the wages on offer in that local labour market confirmed that wage levels really were low rather than being perceived as such, a statement with which the plant manager agreed. This suggests that the expectations of the employees in the data set are relatively modest. Employees at Bun Factory were granted their first formal voice mechanism in late 1995 in the form of team briefings; union recognition was not granted until 1999. This lack of voice afforded workers little opportunity to raise issues of concern, such as their low wage levels. Across the five-company sample the food manufacturer, the owners of Bun Factory, were unusual in using limited or no voice channels in their plants. The other organisations did not correspond to this authoritarian or black-hole type of employer. Of the remaining firms, two offered recognition on a site-by-site basis whilst the quick service restaurant and leisure firm refused union recognition. All of the four other firms offered a range of direct individually-oriented voice channels and almost all sites employed financial incentives. The analysis of WIRS across the twenty year period shows how these firms mirror wider trends such as the economy-wide growth in direct oriented voice mechanisms, and in particular merit pay and employee share ownership.

Any shift from collective to individual voice mechanisms may well have implications for issues such as workplace democracy and the balance of power. In the context of voice over workplace change, declining union recognition may mean less ability to exercise voice in relation to the introduction of new practices and to extract compensation for workplace change. One might assume that the shift from collective to individual voice channels would have implications for employee satisfaction and labour turnover, as has been suggested by previous empirical work. However, this thesis challenges such assumptions, as neither phenomena is lower in the presence of trade unions and direct mechanisms showed little benefit.

It is often remarked that industrial relations as a discipline pays too much attention to white, male full-time workers, to manufacturing and to trade union procedures and outcomes. This thesis has attempted to counter this bias and to enrich the literature by using previously unexplored data sets which focus upon service sector companies, and workforces with large proportions of women, ethnic minorities and part-time staff. Beyond expanding the literature to cover such workers and establishments, this thesis has made a major contribution in terms of its results. Many of the stylised facts of job satisfaction and labour turnover are challenged. In particular the data show a positive relationship between union recognition and quits, and voluntary turnover is demonstrated to be a progression of absence. Future work might pursue these relationships with other data on low paid workers, female and ethnic minority workforces. A further project could seek to explain the association between union recognition and high labour turnover, through a broader, multi-company, study of withdrawal behaviour. The uniqueness of the findings of this thesis emphasises the need to continually broaden the subjects chosen for analysis by those interested in industrial relations.

Appendices

Appendix A – Chapter 2

Appendix B – Chapter 3

Appendix C – Chapter 4

Appendix A – Presents Data For Chapter 2.

Appendix A1. Primary Data Summary

The primary data was originally collected for a Centre for Economic Performance project examining the implementation of the UK's first national minimum wage during 1996 and 1997, funded by the Joseph Rowntree Foundation. The original aim was to focus upon the effects of the minimum wage on "entry-level" jobs – appointments which do not require job related skills or qualifications. Researchers were interested in all the processes surrounding the creation of a vacancy through to the departure of an employee. This required that we collect payroll data; information about the advertisement of vacancies; the hiring process; the background and satisfaction of starters, current staff and leavers; institutional information from site managers; complemented by financial performance information.

In order to ensure that the companies had detailed computerised records and sufficient employees to analyse, only large, nationally operating organisations were considered. Individual companies were approached with a view to concentrating on the service sector. This reflected both the lack of research in this area compared to manufacturing, and the continued growth of jobs in services. The final five firms were in the hotel, food retail, food manufacturing, leisure and quick service restaurant (QSR) industries. Data was collected across five regional labour markets: North West England; South West England; North London; West Midlands and West Yorkshire. This allowed for comparisons across the firms in the same labour market, and was supplemented by New Earnings Survey (NES) and Labour Force Survey (LFS) data on characteristics of these areas. The participating organisations were offered a non-technical summary of their workforce as compared to industry averages and the others in this sample.

The companies in the data set offered wages in the lowest quarter of the NES earnings distribution. However, the low level of the UK's first national minimum wage left the data set redundant: very little impact was felt by these firms. Problems in collecting comprehensive and consistent data were also experienced, particularly where the management of the participating companies changed. Therefore the data set was used to complete a summary report for the Joseph Rowntree Foundation, see Brown et al (1998), but little academic use was made of the data until now.

Company	Hotels	Food Retail	Food Manuf	QSR	Leisure
Number of sites in original sample	7	12	3	28	12
Satisfaction surveys circulated	Yes	Yes	Yes	Yes	Yes
Number of sites used in satisfaction sample	7	5	3	26	11
Proportion of satisfaction sample	21.5	16.6	14.3	14.4	33.1
Payroll data given	Yes	Yes	Yes	Yes	No
Number of sites used in labour turnover sample	7	5	0	0	0
Proportion of labour turnover sample	43.8	56.2	Not used	Not used	Not used
Financial performance information offered	On 69 sites	On 414 sites	On 3 sites	On 374 sites	On 136 sites

Company	Hotels	Food Retail	Food Manuf	QSR	Leisure
Regions covered*	All	North West North London West Midlands	North West North London	All	All
Urban/rural site position	On the edge of towns/cities	Split between urban centres and the edge of towns/cities	On the edge of towns/cities	Generally in city/town centres	Split between urban centres and the edge of towns/cities
Average wage (£ per hour)	3.93	4.04	3.91	3.37	3.64
Managers' views on wages relative to rivals' (company average)	About average	Slightly better than average	About average	About average	About average
Managers' views on labour turnover relative to rivals' (company average)	About average	About average	Slightly better than average	About average	About average
Fringe benefits offered	Free food for staff Free/subsidised transport 5 sites No childcare	Subsidised canteen/food No help with transport No childcare	Subsidised canteen all sites No help with transport No childcare	Almost all (25) offer free food Almost all (22) offer no help with transport No childcare	Subsidised canteen all sites Almost all (11) offer no help No childcare

*The regions used were North West England; South West England; North London; West Midlands and West Yorkshire.

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Appendix A2. Probit Estimates Of Influences On Job Satisfaction And Labour Turnover

Variable	Probit coefficients Job satisfaction	Probit coefficients all labour turnover	Probit coefficients voluntary turnover
Union recognition or presence of members	-0.199 (0.221)	0.136 (0.397)	0.490*** (0.133)
Newsletter	0.005 (0.113)	-0.272** (0.124)	-0.244* (0.146)
Bonus schemes	0.052 (0.174)	-0.422** (0.183)	-0.317* (0.178)
Team briefings	-0.443** (0.176)	0.250*** (0.069)	0.267*** (0.082)
Cascade	0.160 (0.195)	-0.083 (0.094)	-0.042 (0.078)
Hotel chain	0.568* (0.310)	N/a	N/a
Quick service restaurant	0.493* (0.297)	N/a	N/a
Food retailer	1.265*** (0.316)	-1.179*** (0.434)	-1.507*** (0.195)
Leisure firm	1.331*** (0.295)	N/a	N/a
Female	-0.020 (0.101)	0.257 (0.158)	0.288* (0.148)
Age	-0.074* (0..40)	-0.192*** (0.043)	-0.138*** (0.046)
Age^2	0.100** (0.049)	0.222*** (0.051)	0.142** (0.056)
Ethnic minority	0.116 (0.188)	-0.084 (0.291)	-0.033 (0.327)
Married/co-hab	0.022 (0.108)	-0.289* (0.161)	-0.229 (0.176)
One child	0.192 (0.141)	0.241 (0.218)	0.063 (0.228)
Two or more children	0.179 (0.160)	0.278 (0.274)	0.155 (0.283)
CSEs	0.061 (0.272)	0.191 (0.281)	0.322 (0.274)
A levels	-0.169 (0.148)	0.127 (0.298)	0.205 (0.263)
Degree	-0.433** (0.236)	0.558*** (0.182)	0.598*** (0.181)
Vocational qualifications	0.155 (0.157)	-0.463** (0.223)	-0.292 (0.262)
No qualifications	-0.190 (0.137)	0.102 (0.210)	0.016 (0.216)
Much more than other local wages	-0.276 (0.237)	N/a	N/a
A little more than other local wages	-0.304** (0.137)	N/a	N/a
A little less than other local wages	0.355** (0.167)	N/a	N/a

Appendix A2. Probit Estimates Of Influences On Job Satisfaction And Labour Turnover, cont.

Variable	Probit coefficients Job satisfaction	Probit coefficients all labour turnover	Probit coefficients voluntary turnover
A lot less than other local wages	-0.043 (0.163)	N/a	N/a
Relative wage rate	N/a	1.806*** (0.390)	2.387*** (0.574)
South East	-0.752*** (0.175)	N/a	N/a
South West	0.057 (0.226)	N/a	N/a
West Midlands	-0.335** (0.152)	N/a	N/a
North West	-0.059 (0.227)	N/a	N/a
Unemployment in travel to work area 1997q1	N/a	-0.036 (0.048)	-0.004 (0.045)
Tenure	0.039×10^{-2} $(0.132) \times 10^{-2}$	-0.007** (0.003)	-0.009*** (0.003)
Unskilled or trainee	N/a	0.472* (0.277)	0.520* (0.285)
Semi-skilled with some responsibility	N/a	0.002 (0.229)	-0.014 (0.179)
Skilled or supervisory	N/a	-0.140 (0.239)	-0.216 (0.272)
Junior mgt or professional	N/a	-0.772** (0.346)	-0.908** (0.462)
Full time (30 or more hours per week)	N/a	0.556** (0.252)	0.207 (0.343)
Sample size	909	660	660
Log likelihood	-516.420	-273.704	-241.580
Pseudo R^2	13.60%	24.17%	25.91%

Statistically significant results are reported at the 1% ***, 5% ** and 10% * significance levels. The variable appraisal is dropped due to lack of variation across the sample.

Analysis of satisfaction uses data on all five companies. The default categories for the first two columns are the food manufacturer, GCSE qualifications, Yorkshire and Humberside, paying about the same as other local jobs.

Separation analysis uses information on the hotel and retail chains. The default categories for the last two columns are the hotel chain, GCSEs, se mi-skilled occupations. N/a indicates not applicable.

Appendix B – This Appendix Contains Data For Chapter 3.

Appendix B1. The Manager's View On Plant Performance, Market Position And HRM Practices

Question	Response	Questions	response
How would you assess the financial performance of this establishment compared with other establishments in the same industry and local area?	About the same	Does your store perform individual appraisals?	Claim to conduct and highly value appraisals.
How would you assess wages offered by this establishment compared with others in the local labour market?	A little worse than average	How many hours does induction take?	2 hours per employee but claim that managers and admin staff spend 6 hours on it per week. Highly valued but manager's role was to perform exit interviews under this heading
How would you assess the turnover performance of this establishment compared with other establishments in the same industry and local area?	A little worse than average	Performance of new employee compared to skilled staff:	30%
What services do you provide for your employees?	No help with transport No help with child care A subsidised canteen – from 1996	Time taken to become 100% efficient	7.5 weeks
Does your store have a newsletter (non-company wide)?	Yes	Does your store have any bonus schemes?	No
Does your store have regular staff, team or star group meetings?	Yes , All staff meet	Does your store consult trade union representatives for individual grievance and health and safety issues? Not recognised until 1999	No

Appendix B2. Probability Off July 1995 – June 1996: Log Likelihood Ratio (Chow) Test

	Time off – Both sexes	Male sample only	Female only
Variable	Coefficient (sd)	Coefficient (sd)	Coefficient (sd)
Afro-Caribbean	-0.031 (0.024)	-0.028 (0.026)	0.043 (0.090)
White or other ethnic group	-0.178** (0.084)	-0.111 (0.095)	Dropped
Married	-0.021 (0.024)	-0.004 (0.025)	-0.252*** (0.093)
Other marital status – divorced, widowed or not stated.	0.107** (0.051)	0.132** (0.055)	0.106 (0.263)
Women	-0.012 (0.034)		
Trainee	0.065 (0.040)	-0.006 (0.044)	-0.136 (0.361)
Unskilled	0.112*** (0.031)	0.081** (0.032)	-0.253 (0.357)
High Skilled – skilled, line leaders, or engineers.	-0.012 (0.050)	0.016 (0.051)	-0.202 (0.351)
Aged < 26 years	-0.038 (0.037)	0.013 (0.040)	-0.327*** (0.083)
Aged 26-35 years	0.036 (0.028)	0.054* (0.031)	-0.013 (0.072)
Aged 46 years and older	0.060 (0.042)	0.127*** (0.049)	-0.186 (0.210)
Promoted this year	0.354*** (0.019)	0.354*** (0.021)	0.012 (0.237)
Lives less than 2 miles away	-0.034 (0.025)	-0.003 (0.027)	-0.178** (0.078)
Lives more than 5 miles away	-0.019 (0.026)	0.019 (0.027)	-0.207* (0.104)
Tenure	-0.019×10^{-2}*** $(0.003) \times 10^{-2}$	-0.030×10^{-2}*** $(0.004) \times 10^{-2}$	-0.008×10^{-2}*** $(0.005) \times 10^{-2}$
Night shifts	0.023 (0.022)	0.027 (0.023)	-0.040 (0.087)
Other shifts – afternoons, mornings or rotating	-0.151** (0.074)	-0.142* (0.075)	dropped
No of obs	2780	2457	318
Log likelihood	-1730.4181	-1498.7576	-198.1865
Pseudo R2	0.094	0.107	0.095

The table presents marginal coefficients from a probit estimation. It is not possible to use robust coefficients in a likelihood ratio (chow) test, so the standard errors may differ from those presented in the main body of the paper. The default category is semi-skilled ethnically Asian men, who are single, aged 36-45 years, working days. *** indicates significance at the 1% level of confidence, ** at the 5% level, * at the 10% level.

Likelihood ratio test

LR chi2(14) = 66.95   prob>chi2 = 0.000.

This indicates that separate models might fit the data better than a joint model. However, as the female sample size is so small compared to that for males we will continue with joint models.

Appendix B3. Probit Coefficients For Probit Estimates Of The Probability Of Time Off July 1995 – June 1996, Corresponding To Table 6 Of Chapter 3.

Model	Any time off	Attitudinal absence	Voluntary absences only
Variable	Coefficient (sd)	Coefficient (sd)	Coefficient (sd)
Afro-Caribbean	-0.079 (0.062)	0.044 (0.065)	-0.045 (0.062)
White or other ethnic group	-0.451** (0.203)	-0.436* (0.238)	-0.599*** (0.208)
Married	-0.054 (0.060)	-0.137** (0.062)	-0.081 (0.060)
Other marital status – divorced, widowed or not stated.	0.283** (0.143)	-0.048 (0.148)	0.245* (0.144)
Women	-0.030 (0.086)	-0.086 (0.092)	-0.046 (0.086)
Trainee	0.169 (0.105)	-0.046 (0.112)	0.149 (0.107)
Unskilled	0.284*** (0.080)	0.094 (0.085)	0.248*** (0.081)
High Skilled – skilled, line leaders, or engineers.	-0.030 (0.134)	-0.074 (0.146)	0.089 (0.136)
Aged < 26 years	-0.095 (0.093)	-0.134 (0.097)	-0.076 (0.093)
Aged 26-35 years	0.092 (0.071)	0.044 (0.075)	0.100 (0.071)
Aged 46 years and older	0.156 (0.113)	0.172 (0.118)	0.165 (0.114)
Promoted this year	1.059*** (0.076)	0.643*** (0.069)	0.964*** (0.074)
Lives less than 2 miles away	-0.087 (0.063)	0.022 (0.064)	-0.067 (0.063)
Lives more than 5 miles away	-0.049 (0.065)	-0.051 (0.069)	-0.027 (0.065)
Tenure	-0.049×10^{-2}*** $(0.008) \times 10^{-2}$	-0.035×10^{-2}*** $(0.008) \times 10^{-2}$	-0.060×10^{-2}*** $(0.009) \times 10^{-2}$
Night shifts	0.059 (0.055)	-0.062 (0.057)	0.068 (0.055)
Other shifts – afternoons, mornings or rotating	-0.382** (0.184)	-0.273 (0.199)	-0.404** (0.185)
No of obs	2780	2780	2780
Log likelihood	-1730.4181	-1580.9828	-1736.6012
Pseudo R^2	9.4%	5.3%	9.9%
Constant	0.119	-0.458	0.058

The default category is semi-skilled ethnically Asian men, who are single, aged 36-45 years, live 2-5 miles from the plant, and are working days. *** indicates significance at the 1% level of confidence, ** at the 5% level, * at the 10% level.

Appendix B4. Probit And Marginal Coefficients For Probit Estimates Of The Probability Of *Involuntary* Time Off July 1995 – June 1996

Variable	Probit coefficients	Marginal coefficients
Afro-Caribbean	-0.108 (0.102)	-0.010 (0.010)
White or other ethnic group	0.365 (0.287)	0.045 (0.045)
Married	0.096 (0.105)	0.009 (0.010)
Other marital status – divorced, widowed or not stated.	0.166 (0.228)	0.017 (0.026)
Women	0.011 (0.141)	0.001 (0.013)
Trainee	-0.087 (0.179)	-0.007 (0.015)
Unskilled	0.050 (0.129)	0.004 (0.011)
High Skilled – skilled, line leaders, or engineers.	-0.392 (0.243)	-0.026 (0.012)
Aged < 26 years	-0.076 (0.158)	-0.007 (0.013)
Aged 26-35 years	-0.040 (0.115)	-0.004 (0.010)
Aged 46 years and older	0.016 (0.171)	0.001 (0.016)
Promoted this year	0.059 (0.119)	0.006 (0.012)
Lives less than 2 miles away	-0.046 (0.104)	-0.004 (0.009)
Lives more than 5 miles away	-0.077 (0.111)	-0.007 (0.009)
Tenure	0.233×10^{-3}** $(0.097) \times 10^{-3}$	0.021×10^{-3}** $(0.009) \times 10^{-3}$
Night shifts	-0.029 (0.091)	-0.003 (0.008)
Other shifts – afternoons, mornings or rotating	0.169 (0.306)	0.018 (0.036)
No of obs	2780	2780
Log likelihood	-501.5064	-501.5064
Pseudo R^2	2.2%	2.2%
Predicted probability		0.043
Constant	-1.770	

The table presents robust ordinary and marginal coefficients from a probit estimation.
The default category is semi-skilled ethnically Asian men, who are single, aged 36-45 years, living 2-5 miles from the plant, and are working days. *** indicates significance at the 1% level of confidence, ** at the 5% level, * at the 10% level.

That this model performs so poorly compared to that using voluntary absence indicates the need to have health data to examine involuntary absence.

Appendix B5. Negative Binomial Estimates Of Voluntary Absences: Total Days And Spells Between July 1995 – June 1996

Model	Total days off	Spells off	Number of attitudinal absences
Variables	Coefficient (sd)	Coefficient (sd)	Coefficient (sd)
Afro-Caribbean	1.105* (0.066)	1.063 (0.045)	1.119** (0.054)
White or other ethnic group	0.464*** (0.082)	0.519*** (0.073)	0.592*** (0.094)
Married	1.049 (0.061)	0.962 (0.041)	0.862*** (0.042)
Other marital status – divorced, widowed or not stated.	1.337** (0.187)	1.272** (0.124)	1.053 (0.113)
Women	1.087 (0.091)	0.860** (0.057)	0.830** (0.063)
Trainee	1.066 (0.114)	1.096 (0.087)	1.136 (0.102)
Unskilled	1.097 (0.095)	1.059 (0.065)	1.075 (0.073)
High Skilled – skilled, line leaders, or engineers.	0.704** (0.097)	0.722*** (0.071)	0.664*** (0.074)
Aged < 26 years	0.925 (0.083)	0.849** (0.057)	0.798*** (0.061)
Aged 26-35 years	1.054 (0.074)	1.050 (0.055)	1.052 (0.063)
Aged 46 years and older	1.158 (0.125)	1.090 (0.086)	1.183* (0.106)
Promoted this year	2.707*** (0.212)	2.821*** (0.153)	3.272*** (0.194)
Lives less than 2 miles away	0.801*** (0.047)	0.945 (0.041)	1.061 (0.051)
Lives more than 5 miles away	0.975 (0.061)	0.948 (0.043)	0.912* (0.047)
Tenure	1.000* (0.008) x 10^{-2}	1.000*** 0.006 x 10^{-2}	1.000*** (0.007) x 10^{-2}
Night shifts	1.107** (0.057)	1.062 (0.041)	0.987 (0.043)
Other shifts – afternoons, mornings or rotating	0.430*** (0.080)	0.637*** (0.089)	0.756* (0.117)
No of obs	4217	4217	4217
Log likelihood	-12154.594	-8913.0761	-7040.2224
Pseudo R^2	1%	2%	3%

The table presents incidence rates from a negative binomial regression. *** indicates significance at the 1% level of confidence, ** at the 5% level, * at the 10% level.
The default category is semi-skilled ethnically Asian men, who are single, aged 36-45 years, working the day shift.

Appendix B6. Marginal Probit Coefficients Showing The Pressures On The Probability Of Being Off Work, July 1995-June1996, Corresponding To Table 9

Pressures	Version 1-last month's employment & last month's unemployment	Version 2 - last month's employment & this month's unemp'	Version 3 - last month's employment & next month's unemp'	Version 4 - this month's employment & last month's unemp'	Version 5 - this month's employment & this month's unemp'	Version 6- this month's employment & next month's unemp'	Version 7- next month's employment & last month's unemp'	Version 8- next month's employment & this month's unemp'	Version 9- next month's employment & next month's unemp'
Afro-Caribbean	-0.041 (0.033)	-0.034 (0.032)	-0.021 (0.032)	-0.038 (0.033)	-0.029 (0.032)	-0.023 (0.032)	-0.040 (0.034)	-0.035 (0.033)	-0.023 (0.033)
White or other ethnic group	0.039 (0.157)	0.048 (0.143)	0.007 (0.126)	0.058 (0.160)	0.015 (0.142)	-0.027 (0.124)	0.241* (0.125)	0.149 (0.116)	0.050 (0.102)
Married	-0.024 (0.031)	0.007 (0.030)	0.011 (0.030)	-0.023 (0.031)	0.001 (0.030)	0.004 (0.030)	-0.015 (0.033)	-0.008 (0.031)	-0.012 (0.032)
Other marital status – divorced, widowed or not stated.	0.053 (0.078)	0.114 (0.069)	0.121* (0.071)	0.042 (0.079)	0.100 (0.069)	0.114 (0.069)	0.111 (0.080)	0.112 (0.072)	0.010 (0.073)
Women	-0.023 (0.044)	-0.021 (0.042)	-0.024 (0.043)	-0.043 (0.045)	-0.020 (0.042)	-0.020 (0.043)	-0.029 (0.046)	-0.014 (0.043)	-0.014 (0.044)
Trainee	0.100* (0.058)	0.066 (0.055)	0.054 (0.056)	0.109* (0.058)	0.073 (0.054)	0.060 (0.055)	0.038 (0.062)	0.036 (0.058)	0.035 (0.058)
Unskilled	0.070 (0.044)	0.053 (0.040)	0.039 (0.040)	0.071 (0.044)	0.055 (0.040)	0.043 (0.040)	0.035 (0.044)	0.036 (0.041)	0.028 (0.041)
High Skilled – skilled, line leaders, or engineers.	0.039 (0.074)	0.015 (0.066)	0.010 (0.065)	0.029 (0.076)	0.015 (0.066)	0.016 (0.064)	0.044 (0.069)	0.032 (0.064)	0.029 (0.063)
Aged < 26 years	-0.015 (0.048)	0.017 (0.046)	0.018 (0.047)	-0.023 (0.049)	0.009 (0.046)	0.014 (0.046)	-0.002 (0.051)	-0.001 (0.048)	-0.008 (0.048)
Aged 26-35 years	-0.028 (0.036)	-0.002 (0.035)	-0.004 (0.035)	-0.027 (0.037)	-0.003 (0.035)	-0.006 (0.035)	0.002 (0.039)	0.001 (0.036)	-0.009 (0.036)
Aged 46 years and older	-0.069 (0.059)	-0.061 (0.056)	-0.041 (0.056)	-0.081 (0.058)	-0.060 (0.057)	-0.038 (0.057)	-0.065 (0.059)	-0.062 (0.058)	-0.038 (0.059)
Promoted this year	0.026 (0.051)	0.075* (0.044)	0.069 (0.044)	0.032 (0.051)	0.051 (0.045)	0.063 (0.043)	0.084* (0.051)	0.062 (0.047)	0.036 (0.048)

The table presents robust marginal coefficients from a probit estimation. The default category is semi-skilled ethnically.Asian men, who are single, aged 36-45 years, living 2-5 miles from the plant, on days. Unemployment information is from the National Office of Statistics, and refers to the monthly unemployment rate for the North London travel-to-work area.

Appendix B6. Full Results Corresponding To Table 9 - Pressures On Absenteeism (Cont.)

Pressures	Version 1-last month's employment & last month's unemployment	Version 2 - last month's employment & this month's unemployment	Version 3 - last month's employment & next month's unemployment	Version 4 - this month's employment & last month's unemployment	Version 5 - this month's employment & this month's unemployment	Version 6- this month's employment & next month's unemployment	Version 7- next month's employment & last month's unemployment	Version 8- next month's employment & this month's unemployment	Version 9- next month's employment & next month's unemployment
Lives less than 2 miles away	0.015 (0.032)	0.012 (0.030)	0.001 (0.031)	0.007 (0.033)	0.002 (0.031)	-0.001 (0.030)	0.009 (0.034)	-0.016 (0.032)	-0.032 (0.032)
Lives more than 5 miles away	-0.018 (0.035)	-0.010 (0.033)	0.004 (0.033)	-0.021 (0.035)	-0.012 (0.033)	0.005 (0.033)	-0.013 (0.035)	-0.012 (0.033)	0.005 (0.034)
Tenure	-0.017×10^{-2} *** $(0.004) \times 10^{-2}$	-0.017×10^{-2} *** $(0.004) \times 10^{-2}$	-0.019×10^{-2} *** $(0.004) \times 10^{-2}$	-0.016×10^{-2} *** $(0.004) \times 10^{-2}$	-0.018×10^{-2} *** $(0.004) \times 10^{-2}$	-0.021×10^{-2} *** $(0.004) \times 10^{-2}$	-0.014×10^{-2} *** $(0.004) \times 10^{-2}$	-0.018×10^{-2} *** $(0.004) \times 10^{-2}$	-0.023×10^{-2} *** $(0.004) \times 10^{-2}$
Night shifts	0.041 (0.028)	0.062** (0.027)	0.055** (0.027)	0.037 (0.029)	0.056** (0.027)	0.054** (0.027)	0.048 (0.029)	0.041 (0.028)	0.027 (0.029)
Other shifts – afternoons, mornings or rotating	-0.090 (0.138)	-0.080 (0.106)	-0.058 (0.106)	-0.109 (0.135)	-0.080 (0.112)	-0.058 (0.108)	-0.067 (0.109)	-0.070 (0.104)	-0.041 (0.113)
Plant employment variable	0.055*** (0.007)	-0.026 (0.030)	-0.085** (0.038)	0.091*** (0.008)	0.045*** (0.006)	0.020 (0.018)	0.132*** (0.018)	0.071*** (0.007)	0.064*** (0.006)
Unemployment rate variable	0.614*** (0.206)	-1.921 (1.002)	-4.024*** (1.242)	1.710*** (0.202)	0.539*** (0.166)	-0.0412 (0.581)	2.575*** (0.525)	1.247*** (0.191)	1.099*** (0.179)
Interaction term	-0.006*** (0.001)	0.003 (0.003)	0.009** (0.004)	-0.010*** (0.008)	-0.005*** (0.001)	-0.002 (0.002)	-0.013*** (0.002)	-0.008*** (0.001)	-0.007*** (0.001)
Total voluntary days off last year	-0.008*** (0.001)	-0.009*** (0.001)	-0.009*** (0.001)	-0.008*** (0.001)	-0.008*** (0.001)	-0.009*** (0.001)	-0.009*** (0.001)	-0.009*** (0.001)	-0.007*** (0.001)
Diagnostics									
N	2629	2629	2629	2654	2654	2654	2602	2602	2602
Log likelihood	-933.1299	-1081.0193	1056.7855	-928.6131	-1061.3532	-1062.0945	-885.4970	-991.4804	-964.8335
Pseudo R^2	48.56%	40.41%	41.75%	49.35%	42.11	42.07	50.79%	44.89%	46.38%

The table presents robust marginal coefficients from a probit estimation. The default category is as above, *** indicates significance at the 1% level of confidence, ** at the 5% level, * at the 10% level. Unemployment information is from the National Office of Statistics, and refers to the monthly unemployment rate for the North London travel-to-work area.

Appendix B7. Probit Coefficients Corresponding To Table 9, Pressures On The Probability Of Being Off Work, July 1995-June1996.

Pressures	Version 1-last month's employment & last month's unemployment	Version 2 - last month's employment & this month's unemployment	Version 3 - last month's employment & next month's unemployment	Version 4 - this month's employment & last month's unemployment	Version 5 - this month's employment & last month's unemployment	Version 6- this month's employment & this month's unemployment	Version 7- next month's employment & next month's unemployment	Version 8- next month's employment & last month's unemployment	Version 9- next month's employment & this month's unemployment	next month's unemployment
Afro-Caribbean	-0.103 (0.083)	-0.085 (0.080)	-0.052 (0.080)	-0.094 (0.084)	-0.072 (0.080)	-0.058 (0.081)	-0.100 (0.086)	-0.089 (0.083)	-0.057 (0.084)	
White or other ethnic group	0.099 (0.400)	0.120 (0.363)	0.016 (0.316)	0.146 (0.408)	0.037 (0.357)	-0.068 (0.310)	0.624* (0.356)	0.385 (0.318)	0.125 (0.262)	
Married	-0.061 (0.078)	0.016 (0.075)	0.028 (0.076)	-0.058 (0.079)	0.002 (0.075)	0.011 (0.075)	-0.037 (0.083)	-0.019 (0.079)	-0.031 (0.080)	
Other marital status – divorced, widowed or not stated.	0.133 (0.199)	0.291 (0.180)	0.304* (0.183)	0.104 (0.200)	0.257 (0.182)	0.292 (0.181)	0.278 (0.203)	0.287 (0.189)	0.255 (0.191)	
Women	-0.057 (0.111)	-0.052 (0.106)	-0.060 (0.109)	-0.107 (0.112)	-0.051 (0.106)	-0.049 (0.108)	-0.072 (0.117)	-0.035 (0.108)	-0.034 (0.112)	
Trainee	0.256* (0.150)	0.167 (0.138)	0.137 (0.140)	0.277* (0.150)	0.185 (0.140)	0.150 (0.140)	0.095 (0.155)	0.091 (0.145)	0.089 (0.147)	
Unskilled	0.175 (0.110)	0.134 (0.100)	0.098 (0.101)	0.179 (0.110)	0.138 (0.100)	0.108 (0.101)	0.088 (0.111)	0.090 (0.102)	0.070 (0.104)	
High Skilled – skilled, line leaders, or engineers.	0.097 (0.188)	0.038 (0.165)	0.025 (0.163)	0.073 (0.192)	0.038 (0.165)	0.040 (0.160)	0.111 (0.174)	0.080 (0.161)	0.073 (0.159)	
Aged < 26 years	-0.038 (0.120)	0.042 (0.116)	0.044 (0.118)	-0.058 (0.123)	0.023 (0.115)	0.034 (0.116)	-0.004 (0.130)	-0.003 (0.122)	-0.021 (0.121)	
Aged 26-35 years	-0.069 (0.091)	-0.006 (0.088)	-0.009 (0.089)	-0.067 (0.093)	-0.008 (0.087)	-0.015 (0.088)	0.004 (0.098)	0.002 (0.091)	-0.022 (0.091)	
Aged 46 years and older	-0.172 (0.150)	-0.153 (0.142)	-0.102 (0.143)	-0.203 (0.147)	-0.150 (0.142)	-0.096 (0.144)	-0.165 (0.153)	-0.156 (0.147)	-0.095 (0.148)	
Promoted this year	0.065 (0.128)	0.188* (0.111)	0.174 (0.110)	0.081 (0.129)	0.129 (0.113)	0.158 (0.110)	0.212* (0.127)	0.155 (0.120)	0.090 (0.121)	

The table presents robust ordinary coefficients from a probit estimation. The default category is semi-skilled ethnically Asian men, who are single, aged 36-45 years, living 2-5 miles from the plant, and are working days. Unemployment information is from the National Office of Statistics, and refers to the monthly unemployment rate for the North London travel-to-work area.

Appendix B7. Probit Coefficients From Estimates Of Pressures On Absenteeism, Cont.

Pressures	Version 1-last month's employment & last month's unemployment	Version 2 - last month's employment & this month's unemployment	Version 3 - last month's employment & next month's unemployment	Version 4 - this month's employment & last month's unemployment	Version 5 - this month's employment & this month's unemployment	Version 6- this month's employment & next month's unemployment	Version 7- next month's employment & last month's unemployment	Version 8- next month's employment & this month's unemployment	Version 9- next month's employment & next month's unemployment
Lives less than 2 miles away	0.037 (0.081)	0.030 (0.076)	0.003 (0.077)	0.019 (0.082)	0.006 (0.077)	-0.003 (0.076)	0.023 (0.085)	-0.039 (0.080)	-0.080 (0.080)
Lives more than 5 miles away	-0.045 (0.087)	-0.025 (0.082)	0.010 (0.084)	-0.052 (0.087)	-0.029 (0.082)	0.013 (0.083)	-0.033 (0.088)	-0.029 (0.084)	0.013 (0.085)
Tenure	-0.043×10^{-2} *** $(0.010) \times 10^{-2}$	-0.042×10^{-2} *** $(0.009) \times 10^{-2}$	-0.047×10^{-2} *** $(0.009) \times 10^{-2}$	-0.039×10^{-2} *** $(0.010) \times 10^{-2}$	-0.046×10^{-2} *** $(0.009) \times 10^{-2}$	-0.052×10^{-2} *** $(0.009) \times 10^{-2}$	-0.035×10^{-2} *** $(0.010) \times 10^{-2}$	-0.046×10^{-2} *** $(0.010) \times 10^{-2}$	-0.058×10^{-2} *** $(0.010) \times 10^{-2}$
Night shifts	0.103 (0.071)	0.155** (0.068)	0.140** (0.069)	0.092 (0.072)	0.141** (0.068)	0.136** (0.069)	0.120 (0.074)	0.102 (0.071)	0.068 (0.072)
Other shifts – afternoons, mornings or rotating	-0.226 (0.350)	-0.201 (0.269)	-0.150 (0.272)	-0.276 (0.349)	-0.200 (0.284)	-0.145 (0.272)	-0.171 (0.283)	-0.176 (0.264)	-0.102 (0.282)
Plant employment variable	0.138*** (0.018)	-0.066 (0.076)	-0.215** (0.095)	0.229*** (0.019)	0.114*** (0.015)	0.049 (0.046)	0.332*** (0.045)	0.178*** (0.018)	0.162*** (0.016)
Unemployment rate variable	1.542*** (0.517)	-4.817 (2.511)	-10.124*** (3.158)	4.289*** (0.507)	1.354*** (0.416)	-1.033 (1.458)	6.492*** (1.316)	3.130*** (0.479)	2.764*** (0.449)
Interaction term	-0.016*** (0.002)	0.007 (0.008)	0.023** (0.010)	-0.025*** (0.002)	-0.013*** (0.002)	-0.005 (0.005)	-0.033*** (0.005)	-0.020*** (0.002)	-0.019*** (0.002)
Total voluntary days off last year	-0.019*** (0.003)	-0.023*** (0.003)	-0.022*** (0.003)	-0.019*** (0.003)	-0.021*** (0.003)	-0.021*** (0.003)	-0.024*** (0.003)	-0.021*** (0.003)	-0.018*** (0.003)
Diagnostics									
N	2629	2629	2629	2654	2654	2654	2602	2602	2602
Log likelihood	-933.1299	-1081.0193	1056.7855	-928.6131	-1061.3532	-1062.0945	-885.4970	-991.4804	-964.8335
Pseudo R^2	48.56%	40.41%	41.75%	49.35%	42.11	42.07	50.79%	44.89%	46.38%
Constant	-8.920	47.043	94.781	-37.856	-9.142	11.126	-65.017	-25.740	-20.388

The table presents robust ordinary coefficients from a probit estimation. The default category is semi-skilled ethnically Asian men, who are single, aged 36-45 years, living 2-5 miles from the plant, and are working days. *** indicates significance at the 1% level of confidence, ** at the 5% level, * at the 10% level. Unemployment information is from the National Office of Statistics, and refers to the monthly unemployment rate for the North London travel-to-work area.

Appendix B8. Sample Means For The Subset Of Employees Returning Satisfaction Questionnaires

Variable		Variable	
Gender	76.9% male	Wage rate May 1994 - trainee	£3.00 per hour
Distance from home to work (miles)	4.85 (3.56)	Wage rate May 1994 – unskilled	£3.34
Marital status - single	32.3%	Wage rate May 1994 – semi-skilled	£4.22
Marital status – married	42.4%	Wage rate May 1994 – skilled	£4.67
Marital status – other (divorced, separated, widowed)	25.3%	Wage rate May 1994 – team leader	£5.11
Ethnic status – afro-Caribbean	28.8%	Wage rate May 1994 – engineer	£6.56
Ethnic status – Asian	71.2%	Wage rate May 1995 – trainee	£3.16 per hour
Ethnic status – white & other	0	Wage rate May 1995 – unskilled	£3.52
Tenure (days)	1047 (793)	Wage rate May 1995 – semi-skilled	£4.32
Age (years)	36.5 (9.7)	Wage rate May 1995-skilled	£4.78
Promoted 1/7/95-30/6/96	7.4%	Wage rate May 1995 – team leader	£5.23
Grade – trainee	7.9%	Wage rate May 1995 – engineer	£6.72
Grade – unskilled	59.0%	Wage rate May 1996 - trainee	£3.19 per hour
Grade – semi-skilled	21.4%	Wage rate May 1996 – unskilled	£3.75
Grade – high (skilled, team leaders, engineers)	11.8%	Wage rate May 1996 – semi-skilled	£4.45
Night shifts	59.3%	Wage rate May 1996 – skilled	£4.92
Day shifts	39.8%	Wage rate May 1996 – team leader	£5.39
Other shifts	1%	Wage rate May 1996 – engineer	£6.92

Figures in parentheses are standard errors.
The table shows that the respondents to the satisfaction questionnaire were older; more likely to be of Asian descent; to be female; to be divorced, separated or widowed; and had longer tenure than the population of all staff.

Appendix B9. Correlations Between Satisfaction And Absenteeism Variables

Facet of satisfaction	Probability of voluntary absence	Number of voluntary spells	Total number of days off	Probability of any attitudinal absences	Number of attitudinal absences	Number of voluntary spells last year	Total number of days off last year
Job content							
I feel like I could stay in the job forever.	-0.015	-0.428***	-0.375***	-0.040	-0.341***	-0.457***	-0.241***
I find the job challenging.	0.081	0.080	0.231***	-0.027	-0.104	-0.106	0.098
I am interested in this type of business.	-0.073	-0.394***	-0.185***	-0.109	-0.441***	-0.387***	-0.114
My promotion prospects are good.	0.135*	-0.185***	0.001	0.048	-0.237***	-0.448***	-0.170**
When I get home from this job I am tired.	0.157**	0.196***	0.070	0.131*	0.306***	-0.048	-0.278***
Job context							
I get along well with my supervisor.	-0.095	-0.294***	-0.016	-0.145**	-0.428***	-0.267***	-0.056
Getting to work is not a problem.	0.048	-0.313***	-0.326***	0.073	-0.211***	-0.365***	-0.170**
The hours suit me.	0.028	0.219***	-0.019	0.103	0.336***	0.081	0.095
I get on well with the other workers.	-0.130*	0.176**	0.176**	-0.109	0.148**	0.298***	0.128*
This company is a good employer.	0.050	-0.391***	-0.390***	0.006	-0.352***	-0.496***	-0.198***
Job content and context variables							
The pay is good.	0.022	-0.150***	0.036	-0.042	-0.210***	-0.229***	0.085
All in all, I am satisfied with the job.	0.089	-0.090	-0.065	0.042	-0.125*	-0.250***	-0.141**

Respondents are asked to show their agreement with these statements on a scale of 1, for agree strongly, to 5, for disagree strongly. The time period for all absence variables is 1st July 1995 until 30th June 1996. Satisfaction questionnaires were returned during Autumn 1996. *** indicates significance at the 1% level of confidence, ** at the 5% level, * at the 10% level. This table corresponds to table 11, discussed in the text.

Appendix B10a. Difference In Difference Equation For March To May 1995

March – May 1995	Trainees	Unskilled	Semi-skilled	High skilled
Time dummy	-0.067*** (0.012)	0.000 (0.016)	-0.070*** (0.015)	-0.069*** (0.015)
Grade	-0.077*** (0.011)	0.086*** (0.016)	-0.077*** (0.015)	-0.065*** (0.016)
Interaction	0.567 (0.355)	-0.087*** (0.023)	0.060*** (0.017)	0.049*** (0.018)
Constant	0.077*** (0.011)	0.015** (0.006)	0.086*** (0.013)	0.085*** (0.013)
No of obs	466	466	466	466
R^2	9.71%	8.30%	6.35%	6.00%

These tables differ from tables 13a-13d (chapter 3) in that they use all absence data, whereas tables 13a-13d use simply voluntary absences. *** indicates significance at the 1% level of confidence, ** at the 5% level, * at the 10% level.

Appendix B10b. Difference In Difference Equation For April To June 1995

April – June 1995	Trainees	Unskilled	Semi-skilled	High skilled
Time dummy	-0.051*** (0.017)	-0.040 (0.025)	-0.059*** (0.019)	-0.057*** (0.019)
Grade	0.252 (0.274)	0.049* (0.030)	-0.062* (0.034)	-0.049 (0.033)
Interaction	-0.283 (0.273)	-0.020 (0.032)	0.039 (0.037)	0.024 (0.035)
Constant	0.082*** (0.014)	0.049** (0.024)	0.092*** (0.016)	0.092*** (0.016)
No of obs	522	522	522	522
R^2	2.91%	2.83%	2.59%	2.43%

Appendix B10c. Difference In Difference Equation For October To December 1995

October – December 1995	Trainees	Unskilled	Semi-skilled	High skilled
Time dummy	-0.004 (0.013)	-0.017 (0.015)	-0.002 (0.016)	-0.005 (0.016)
Grade	0.145 (0.103)	0.037** (0.019)	-0.037** (0.017)	-0.043*** (0.014)
Interaction	-0.041 (0.121)	0.020 (0.026)	-0.024 (0.021)	-0.004 (0.021)
Constant	0.052*** (0.009)	0.036*** (0.013)	0.063*** (0.011)	0.063*** (0.011)
No of obs	538	538	538	538
R^2	2.43%	2.18%	1.28%	0.96%

Appendix B10d. Difference In Difference Equation For April To June 1996

April – June 1996	Trainees	Unskilled	Semi-skilled	High skilled
Time dummy	-0.011 (0.010)	-0.010 (0.015)	-0.002 (0.011)	-0.003 (0.011)
Grade	-0.024*** (0.007)	0.005 (0.014)	0.003 (0.022)	0.004 (0.026)
Interaction	0.047 (0.037)	0.007 (0.020)	-0.022 (0.023)	-0.022 (0.027)
Constant	0.024*** (0.007)	0.019 (0.012)	0.021*** (0.007)	0.021*** (0.006)
No of obs	562	562	562	562
R^2	0.44%	0.22%	0.27%	0.23%

Appendix B11. Correlations Between Measures Of Absenteeism And Labour Turnover

Absenteeism variable July 1995-June1996	Labour turnover (1/7/95-30/6/96)	Voluntary labour turnover 1/7/95-30/6/96)	Absenteeism variable July1994-June1995	Labour turnover (1/7/95-30/6/96)	Voluntary labour turnover 1/7/95-30/6/96)
Any time off	-0.018	-0.106***	Voluntary time off	-0.121***	-0.032
Voluntary time off	0.004	-0.082***	Attitudinal absences	0.031*	0.016
Attitudinal absences	-0.092***	-0.099***	Number of attitudinal absences	0.115***	0.131***
Voluntary total days off	0.452***	0.122***	Voluntary spells	0.084***	0.088***
Voluntary spells	0.362***	0.059***	Voluntary total days off	0.015	0.015
Number of attitudinal absences	0.241***	0.000			

*** indicates significance at the 1% level of confidence, ** at the 5% level, * at the 10% level. Voluntary labour turnover defined as termination not due to misconduct, sackings, end of temporary or seasonal contracts, redundancy, retirement, bad time keeping, ill health or a transfer to staff.

Appendix B12. Probit Coefficients From Estimates Of The Probability Of Leaving July 1995 – June 1996, Corresponding To Table 15

Model	Turnover	Voluntary turnover (1)	Voluntary turnover (2)
Variable	Coefficient (sd)	Coefficient (sd)	Coefficient (sd)
Afro-Caribbean	-0.095 (0.064)	-0.274*** (0.069)	-0.315*** (0.070)
White or other ethnic group	0.449* (0.235)	-1.042*** (0.304)	-1.461*** (0.377)
Married	0.225*** (0.063)	0.368*** (0.070)	0.377*** (0.070)
Other marital status – divorced, widowed or not stated.	0.043 (0.146)	Dropped	Dropped
Women	0.035 (0.096)	0.051 (0.104)	0.085 (0.106)
Trainee	0.439*** (0.111)	0.229* (0.128)	0.251* (0.129)
Unskilled	0.597*** (0.087)	0.254** (0.098)	0.201** (0.098)
High Skilled – skilled, line leaders, or engineers.	0.270* (0.155)	-0.679*** (0.226)	-0.649*** (0.225)
Aged < 26 years	-0.152 (0.095)	0.081 (0.112)	0.052 (0.112)
Aged 26-35 years	0.003×10^{-1} $(0.751) \times 10^{-1}$	0.279*** (0.091)	0.288*** (0.091)
Aged 46 years and older	0.111 (0.138)	0.117 (0.161)	0.186 (0.163)
Promoted this year	-0.887*** (0.080)	-0.803*** (0.106)	-0.689*** (0.107)
Lives less than 2 miles away	-0.019 (0.064)	-0.281*** (0.072)	-0.288*** (0.073)
Lives more than 5 miles away	0.041 (0.068)	0.115 (0.075)	0.113 (0.075)
Tenure	-0.152×10^{-2}*** $(0.012) \times 10^{-2}$	0.128×10^{-2}*** $(0.015) \times 10^{-2}$	-0.132×10^{-2}*** $(0.015) \times 10^{-2}$
Night shifts	-0.100* (0.055)	-0.287*** (0.063)	-0.361*** (0.066)
Other shifts – afternoons, mornings or rotating	-0.191 (0.235)	0.004 (0.237)	0.013 (0.231)
Next month's plant employment	N/a	-0.028 (0.023)	-0.014 (0.024)
Last month's local unemployment rate	N/a	-0.058 (0.685)	0.329 (0.695)
Interaction term	N/a	0.003 (0.002)	0.001 (0.002)
Lagged voluntary total days off	N/a	N/a	0.014*** (0.003)
No of obs	2788	2485	2485
Log likelihood	-1572.3404	-1185.0843	-1173.0877
Pseudo R^2	18.61%	16.28%	17.13%
Constant	0.525	0.212	-3.512

The table presents robust coefficients from a probit estimation. Column 1 uses data on all absences, voluntary and involuntary. Column 2 uses voluntary absences and adds in external and internal pressures. Column 3 adds lagged total days off as an explanatory variable.
The default category is semi-skilled ethnically Asian men, who are single, aged 36-45 years, living 2-5 miles from the plant, and working days. *** indicates significance at the 1% level of confidence, ** at the 5% level, * at the 10% level.

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Appendix B13. Marginal Coefficients Results Corresponding To Table 15- Pressures On Voluntary Labour Turnover

Pressures	Model 1-last month's employment & last month's unemp'	Model 2 - last month's employment & this month's unemp'	Model 3 - last month's employment & next month's unemp'	Model 4 - this month's employment & last month's unemp'	Model 5 - this month's employment & this month's unemp'	Model 6- this month's employment & next month's unemp'	Model 7- next month's employment & last month's unemp'	Model 8- next month's employment & this month's unemp'	Model 9- next month's employment & next month's unemp'
Afro-Caribbean	-0.041 (0.033)	-0.034 (0.032)	-0.021 (0.032)	-0.038 (0.033)	-0.084*** (0.021)	-0.023 (0.032)	-0.040 (0.034)	-0.035 (0.033)	-0.023 (0.033)
White or other ethnic group	0.03943 (0.157)	0.048 (0.143)	0.007 (0.126)	0.058 (0.160)	-0.175*** (0.021)	-0.027 (0.124)	0.241* (0.125)	0.149 (0.116)	0.050 (0.102)
Married	-0.0243 (0.031)	0.007 (0.030)	0.011 (0.030)	-0.023 (0.031)	0.098*** (0.019)	0.004 (0.030)	-0.015 (0.033)	-0.008 (0.031)	-0.012 (0.032)
Other marital status – divorced, widowed or not stated.	0.0535 (0.078)	0.114 (0.069)	0.121* (0.071)	0.042 (0.079)	Dropped	0.114 (0.069)	0.111 (0.080)	0.112 (0.072)	0.010 (0.073)
Women	-0.023 (0.044)	-0.021 (0.042)	-0.024 (0.043)	-0.043 (0.045)	0.006 (0.029)	-0.020 (0.043)	-0.029 (0.046)	-0.014 (0.043)	-0.014 (0.044)
Trainee	0.100* (0.058)	0.066 (0.055)	0.054 (0.056)	0.109* (0.058)	0.079** (0.042)	0.060 (0.055)	0.038 (0.062)	0.036 (0.058)	0.035 (0.058)
Unskilled	0.070 (0.044)	0.053 (0.040)	0.039 (0.040)	0.071 (0.044)	0.071*** (0.025)	0.043 (0.040)	0.035 (0.044)	0.036 (0.041)	0.028 (0.041)
High Skilled – skilled, line leaders, or engineers.	0.039 (0.074)	0.015 (0.066)	0.010 (0.065)	0.029 (0.076)	-0.136*** (0.033)	0.016 (0.064)	0.044 (0.069)	0.032 (0.064)	0.029 (0.063)
Aged < 26 years	-0.015 (0.048)	0.017 (0.046)	0.018 (0.047)	-0.023 (0.049)	0.021 (0.032)	0.014 (0.046)	-0.002 (0.051)	-0.001 (0.048)	-0.008 (0.048)
Aged 26-35 years	-0.028 (0.036)	-0.002 (0.035)	-0.004 (0.035)	-0.027 (0.037)	0.075*** (0.025)	-0.006 (0.035)	0.002 (0.039)	-0.001 (0.036)	-0.009 (0.036)
Aged 46 years and older	-0.069 (0.059)	-0.061 (0.056)	-0.041 (0.056)	-0.081 (0.058)	0.035 (0.049)	-0.038 (0.057)	-0.065 (0.059)	-0.062 (0.058)	-0.038 (0.059)
Promoted this year	0.026 (0.051)	0.075* (0.044)	0.069 (0.044)	0.032 (0.051)	-0.162*** (0.017)	0.063 (0.043)	0.084* (0.051)	0.062 (0.047)	0.036 (0.048)

Unemployment information is from the National Office of Statistics, and refers to the monthly unemployment rate for the North London travel-to-work area. This table presents marginal coefficients from a robust probit regression. *** indicates significance at the 1% level of confidence, ** at the 5% level, * at the 10% level. This table attempts to find the best combination of external and internal pressures to explain voluntary labour turnover, similarly to appendix B6.

Appendix B13. Marginal Coefficients Corresponding To Table 15 - Pressures On Voluntary Labour Turnover (Cont.)

Pressures	Model 1-last month's employment & last month's unemployment	Model 2 - last month's employment & this month's unemployment	Model 3 - last month's employment & next month's unemployment	Model 4 - this month's employment & last month's unemployment	Model 5 - this month's employment & this month's unemployment	Model 6- this month's employment & next month's unemployment	Model 7- next month's employment & last month's unemployment	Model 8- next month's employment & this month's unemployment	Model 9- next month's employment & next month's unemployment
Lives less than 2 miles away	0.015 (0.032)	0.012 (0.030)	0.001 (0.031)	0.007 (0.033)	-0.075*** (0.018)	-0.001 (0.030)	0.009 (0.034)	-0.016 (0.032)	-0.032 (0.032)
Lives more than 5 miles away	-0.018 (0.035)	-0.010 (0.033)	0.004 (0.033)	-0.021 (0.035)	0.028 (0.022)	0.005 (0.033)	-0.013 (0.035)	-0.012 (0.033)	0.005 (0.034)
Tenure	-0.017×10^{-2} *** $(0.004) \times 10^{-2}$	-0.017×10^{-2} *** $(0.004) \times 10^{-2}$	-0.019×10^{-2} *** $(0.004) \times 10^{-2}$	-0.016×10^{-2} *** $(0.004) \times 10^{-2}$	-0.035×10^{-2} *** $(0.004) \times 10^{-2}$	-0.021×10^{-2} *** $(0.004) \times 10^{-2}$	-0.014×10^{-2} *** $(0.004) \times 10^{-2}$	-0.018×10^{-2} *** $(0.004) \times 10^{-2}$	-0.023×10^{-2} *** $(0.004) \times 10^{-2}$
Night shifts	0.041 (0.028)	0.062** (0.027)	0.055** (0.027)	0.037 (0.029)	-0.084*** (0.018)	0.054** (0.027)	0.0476 (0.029)	0.041 (0.028)	0.027 (0.029)
Other shifts – afternoons, mornings or rotating	-0.090 (0.138)	-0.080 (0.106)	-0.058 (0.106)	-0.109 (0.135)	0.006 (0.065)	-0.058 (0.108)	-0.067 (0.109)	-0.070 (0.104)	-0.041 (0.113)
Plant employment variable	0.055*** (0.007)	-0.026 (0.030)	-0.085** (0.038)	0.091*** (0.008)	-0.006 (0.005)	0.020 (0.018)	0.132*** (0.018)	0.071*** (0.007)	0.064*** (0.006)
Unemployment rate variable	0.614*** (0.206)	-1.921 (1.002)	-4.024*** (1.242)	1.710*** (0.202)	0.063 (0.151)	-0.0412 (0.581)	2.575*** (0.525)	1.247*** (0.191)	1.099*** (0.179)
Interaction term	-0.006*** (0.001)	0.003 (0.003)	0.009** (0.004)	-0.010*** (0.008)	$0.008 \times 10{-}1$ $(0.005) \times 10{-}1$	-0.002 (0.002)	-0.013*** (0.002)	-0.008*** (0.001)	-0.007*** (0.001)
Diagnostics									
N	2629	2629	2629	2654	2536	2654	2602	2602	2602
Log likelihood	-933.1299	-1081.0193	1056.7855	-928.6131	-1177.4838	-1062.0945	-885.4970	-991.4804	-964.8335
Pseudo R^2	48.56%	40.41%	41.75%	49.35%	17.68	42.07	50.79%	44.89%	46.38%

This table presents marginal coefficients from a robust probit regression. Unemployment information is from the National Office of Statistics, and refers to the monthly unemployment rate for the North London travel-to-work area.

Appendix B14. Probit And Marginal Coefficients From Estimates Of The Probability Of Leaving July 1995 – June 1996, Using Lagged Spells Of Absence

Model	Probit coefficients	Marginal coefficients
Variable	Coefficient (sd)	Coefficient (sd)
Afro-Caribbean	-0.353*** (0.071)	-0.104*** (0.022)
White or other ethnic group	-1.204*** (0.326)	-0.188*** (0.020)
Married	0.366*** (0.070)	0.105*** (0.020)
Other marital status – divorced, widowed or not stated.	Dropped	Dropped
Women	0.086 (0.106)	0.025 (0.032)
Trainee	0.286** (0.130)	0.089** (0.043)
Unskilled	0.222** (0.098)	0.061** (0.026)
High Skilled – skilled, line leaders, or engineers.	-0.643*** (0.225)	-0.140*** (0.034)
Aged < 26 years	0.028 (0.113)	0.008 (0.033)
Aged 26-35 years	0.276*** (0.091)	0.077*** (0.025)
Aged 46 years and older	0.167 (0.162)	0.050 (0.052)
Promoted this year	-0.680*** (0.108)	-0.157*** (0.019)
Lives less than 2 miles away	-0.293*** (0.073)	-0.080*** (0.019)
Lives more than 5 miles away	0.121 (0.075)	0.035 (0.022)
Tenure	-0.013×10^{-1}*** $(0.002) \times 10^{-1}$	-0.038×10^{-2}*** $(0.004) \times 10^{-2}$
Night shifts	-0.334*** (0.065)	-0.096*** (0.019)
Other shifts – afternoons, mornings or rotating	0.049 (0.0230	0.014 (0.068)
Next month's plant employment	-0.011 (0.024)	-0.003 (0.007)
Last month's local unemployment rate	0.408 (0.699)	0.116 (0.199)
Interaction term	0.001 (0.002)	0.003×10^{-1} $(0.007) \times 10^{-1}$
Spells off last year	0.037*** (0.008)	0.011*** (0.002)
No of obs	2485	2485
Log likelihood	-1174.5671	-1174.5671
Pseudo R^2	17.02%	17.02%
Predicted probability		0.205
Constant	-4.301	

The table presents robust marginal coefficients from a probit estimation. *** indicates significance at the 1% level of confidence, ** at the 5% level, * at the 10% level. The default category is semi-skilled ethnically Asian men, who are single, aged 36-45 years, working days.

All information refers to voluntary turnover and absenteeism.

Appendix C – Appendices For Chapter 4

Appendix C1. Probit Regressions Of The Influences On The Introduction Of Workplace Change

Independent variables	Whole Sample	1979-1983	1987-91	1991-95	1996-2000
Up to 25 employees	-0.036 (0.033)	-0.140** (0.063)	-0.076 (0.067)	-0.013 (0.068)	0.164* (0.090)
26 - 50 employees	-0.043 (0.033)	-0.055 (0.061)	-0.120* (0.067)	-0.092 (0.074)	0.053 (0.095)
51 - 100 employees	-0.017 (0.031)	-0.048 (0.058)	0.002 (0.062)	0.055 (0.068)	0.014 (0.091)
201-500 employees	0.044 (0.031)	0.078 (0.058)	0.060 (0.063)	-0.039 (0.072)	-0.146 (0.097)
More than 500 employees	0.073** (0.033)	0.050 (0.065)	0.167** (0.064)	-0.029 (0.073)	-0.031 (0.095)
Scotland	-0.001 (0.037)	0.030 (0.073)	-0.019 (0.076)	0.168** (0.080)	0.003 (0.106)
North East	0.095** (0.044)	0.022 (0.085)	0.158* (0.084)	0.093 (0.092)	0.068 (0.133)
Yorkshire	-0.159*** (0.042)	-0.164** (0.074)	-0.225*** (0.086)	-0.167* (0.094)	-0.032 (0.119)
East Midlands	-0.215*** (0.045)	-0.164** (0.082)	-0.346*** (0.098)	-0.176* (0.103)	-0.116 (0.124)
East Anglia	-0.219*** (0.059)	-0.292** (0.125)	-0.427*** (0.121)	-0.198 (0.122)	-0.056 (0.150)
South East	-0.105*** (0.034)	-0.084 (0.062)	-0.181*** (0.067)	-0.108 (0.075)	-0.275** (0.110)
South West	-0.141*** (0.044)	-0.224*** (0.085)	-0.189** (0.085)	-0.051 (0.094)	-0.172 (0.131)
West Midlands	0.005 (0.038)	0.004 (0.070)	-0.045 (0.078)	0.031 (0.085)	0.075 (0.103)
Wales	0.015 (0.046)	0.035 (0.087)	0.023 (0.093)	0.015 (0.101)	-0.007 (0.139)
Food, drink & tobacco	0.101* (0.054)	0.117 (0.096)	-0.041 (0.113)	0.211 (0.137)	-0.054 (0.149)

Appendix C1. Probit Regressions Of The Influences On The Introduction Of Workplace Change, continued

Chemicals	-0.000	-0.041	-0.098	0.305**	-0.234*
	(0.051)	(0.094)	(0.105)	(0.124)	(0.136)
Metals	0.073	-0.017	-0.050	0.284**	-0.114
	(0.058)	(0.105)	(0.122)	(0.139)	(0.150)
Mechanical engineering	0.090*	0.077	0.039	0.142	-0.130
	(0.048)	(0.087)	(0.100)	(0.122)	(0.126)
Instrument engineering	0.021	0.041	-0.063	-0.020	-0.111
	(0.053)	(0.094)	(0.109)	(0.135)	(0.144)
Textiles	-0.126**	-0.386***	-0.198	0.163	-0.145
	(0.061)	(0.112)	(0.124)	(0.146)	(0.160)
Paper & publishing	0.322***	0.336***	0.332***	0.276*	-0.007
	(0.057)	(0.099)	(0.118)	(0.144)	(0.162)
Construction	-0.568**	N/a	-0.153	0.336**	-0.085
	(0.226)		(0.395)	(0.143)	(0.342)
Transport & Communications	0.023	N/a	0.110		0.109
	(0.074)		(0.143)		(0.155)
Distributive Trades	-0.256***	N/a	-0.501***	0.104	0.080
	(0.073)		(0.133)	(0.147)	(0.155)
Insurance	-0.636***	N/a	-0.721***	-0.301	-0.559**
	(0.099)		(0.158)	(0.186)	(0.243)
Prof. Services	-0.372***	N/a	-0.428***	0.107	-0.586***
	(0.067)		(0.139)	(0.133)	(0.165)
Leisure Services	-0.373**	N/a	-0.914***	0.234	0.016
	(0.166)		(0.329)	(0.251)	(0.313)
Misc. Services	-0.387**	N/a	-0.435	0.169	-0.287
	(0.191)		(0.299)	(0.260)	(0.445)
Manuals	0.140***	-0.028	0.360***	0.090	0.107
	(0.025)	(0.053)	(0.052)	(0.056)	(0.071)
Non-manuals	-0.178***	-0.315***	-0.067	-0.244***	-0.135*
	(0.026)	(0.056)	(0.055)	(0.058)	(0.075)
Unionised	0.370***	0.412***	0.117***	0.279***	0.597***
	(0.020)	(0.058)	(0.038)	(0.042)	(0.058)

Appendix C1. Probit Regressions Of The Influences On The Introduction Of Workplace Change, continued

Workplace change last year	0.722***	0.564***	0.714***	0.667***	0.561***
	(0.024)	(0.047)	(0.045)	(0.054)	(0.081)
Emp' drop over last year (10% or more)	0.005	-0.109**	-0.010	0.082*	-0.043
	(0.024)	(0.053)	(0.046)	(0.049)	(0.100)
Last time firm is in data set	-0.032	-0.099	-0.005	-0.023	-0.0126
	(0.035)	(0.067)	(0.076)	(0.077)	(0.219)
Interaction of the above	0.020	-0.009	-0.052	-0.044	0.218***
	(0.075)	(0.166)	(0.141)	(0.0157)	(0.063)
No. of Obs.	30041	6390	6924	8317	6474
Pseudo R"	11.05%	6.44%	12.55	9.29	11.76
Log likelihood	-11103.761	-3242.4812	-2809.5932	-2264.5499	-1253.8865

*indicates significance at the 10% level; ** indicates significance at the 5% level; *** indicates significance at the 1% level.

+ represents construction and transport and distribution. The default categories are 101 to 200 employees; brick industry ; mixed settlement groups; the North West.

Appendix C2. Probit Estimates Of Influences On The Introduction Of The Separate Constituents Of Workplace Change

Independent variables	Flexible working practices 1985-2000	Shift working 1979-2000	End of restrictive practices 1979-2000	New technology 1979-2000	Other productivity agreements 1979-97
Up to 25 employees	0.101** (0.050)	-0.155** (0.067)	-0.160*** (0.050)	-0.013 (0.045)	-0.104** (0.042)
26 - 50 employees	0.059 (0.052)	-0.103 (0.065)	-0.130** (0.050)	-0.105** (0.047)	-0.046 (0.041)
51 - 100 employees	0.103** (0.048)	-0.011 (0.059)	-0.047 (0.045)	-0.051 (0.044)	0.011 (0.038)
201-500 employees	0.135*** (0.049)	0.054 (0.057)	0.060 (0.044)	0.056 (0.043)	0.067* (0.039)
More than 500 employees	0.140*** (0.051)	0.022 (0.063)	0.166*** (0.046)	0.097** (0.046)	0.126*** (0.041)
Scotland	-0.065 (0.056)	0.041 (0.069)	0.106** (0.053)	0.132** (0.052)	-0.086* (0.046)
North East	0.038 (0.065)	0.030 (0.083)	0.098 (0.063)	0.133** (0.060)	0.028 (0.053)
Yorkshire	-0.124** (0.063)	-0.068 (0.078)	-0.157** (0.062)	-0.099* (0.060)	-0.213*** (0.052)
East Midlands	-0.176** (0.069)	-0.325*** (0.098)	-0.167** (0.068)	-0.054 (0.063)	-0.248*** (0.057)
East Anglia	-0.180** (0.083)	-0.310** (0.130)	-0.140 (0.090)	-0.110 (0.086)	-0.409*** (0.081)
South East	-0.115** (0.052)	-0.120* (0.065)	-0.037 (0.049)	-0.087* (0.049)	-0.111*** (0.040)
South West	-0.203*** (0.068)	-0.085 (0.082)	-0.108* (0.065)	-0.051 (0.062)	-0.173*** (0.054)
West Midlands	-0.042 (0.057)	-0.018 (0.071)	0.084 (0.054)	0.074 (0.052)	0.006 (0.045)
Wales	-0.071 (0.073)	0.094 (0.083)	0.076 (0.066)	0.175*** (0.062)	-0.045 (0.056)
Food, drink & tobacco	0.051 (0.086)	0.158 (0.104)	-0.022 (0.076)	0.037 (0.073)	0.046 (0.068)

Appendix C2. Probit Estimates Of Influences On The Introduction Of The Separate Constituents Of Workplace Change, continued

Chemicals	-0.053	0.074	-0.089	0.004	-0.009
	(0.080)	(0.100)	(0.072)	(0.070)	(0.064)
Metals	0.101	0.018	0.081	-0.018	0.123*
	(0.090)	(0.114)	(0.079)	(0.079)	(0.071)
Mechanical engineering	0.020	0.123	0.005	0.010	0.098
	(0.076)	(0.095)	(0.067)	(0.066)	(0.060)
Instrument engineering	-0.028	0.034	-0.097	-0.085	0.094
	(0.084)	(0.104)	(0.076)	(0.073)	(0.065)
Textiles	0.155*	0.017	-0.383***	-0.164*	-0.195**
	(0.089)	(0.117)	(0.095)	(0.084)	(0.078)
Paper & publishing	0.264***	0.086	0.330***	0.213***	0.326***
	(0.089)	(0.114)	(0.077)	(0.076)	(0.069)
Construction	-0.388	-0.165	-0.544	-0.387	-0.683*
	(0.289)	(0.368)	(0.374)	(0.287)	(0.377)
Transport & Communications	0.321***	0.002	-0.158	-0.396***	-0.316***
	(0.096)	(0.148)	(0.112)	(0.123)	(0.114)
Distributive Trades	-0.038	-0.210	-0.458***	-0.373***	-0.574***
	(0.098)	(0.159)	(0.121)	(0.111)	(0.116)
Insurance	-0.480***	-0.718**	-0.795***	-0.743***	-0.812***
	(0.139)	(0.317)	(0.188)	(0.165)	(0.154)
Prof. Services	-0.184**	-0.540***	-0.301***	-0.518***	-0.365***
	(0.094)	(0.183)	(0.103)	(0.102)	(0.093)
Leisure Services	-0.053	N/a	-0.736*	-0.813**	-0.563**
	(0.191)		(0.383)	(0.361)	(0.246)
Misc. Services	-0.085	N/a	-0.319	0.070	-0.182
	(0.215)		(0.305)	(0.199)	(0.243)
Leisure & Misc combined	N/a	-0.429	N/a	N/a	N/a
		(0.352)			
Non-manuals	-0.131***	-0.288***	-0.204***	-0.084**	-0.222***
	(0.042)	(0.054)	(0.042)	(0.036)	(0.034)
Manuals	0.200***	0.040	0.244***	-0.042	0.083***
	(0.038)	(0.046)	(0.036)	(0.035)	(0.031)
Unionised	0.236***	0.133***	0.384***	0.297***	0.410***
	(0.029)	(0.039)	(0.030)	(0.028)	(0.026)

Appendix C2. Probit Estimates Of Influences On The Introduction Of The Separate Constituents Of Workplace Change, continued

Workplace Change Last Year	0.519***	0.416***	0.516***	0.655***	0.561***
	(0.036)	(0.042)	(0.032)	(0.031)	(0.028)
Emp' drop over last year (10% or more)	0.109***	0.044	0.078**	-0.077**	-0.059*
	(0.034)	(0.045)	(0.032)	(0.035)	(0.031)
Last time firm is in data set	-0.023	-0.054	0.038	0.023	-0.065
	(0.054)	(0.072)	(0.050)	(0.048)	(0.046)
Interaction of the above	0.089	0.027	0.124	0.062	0.082
	(0.101)	(0.143)	(0.101)	(0.104)	(0.095)
Pseudo R^2	7.64%	7.25%	12.42%	9.32%	10.73%
No. of Obs.	22389	30041	30041	30041	26476
Log likelihood	-4442.2007	-2486.8454	-4756.314	-5079.5695	-6772.5798

* indicates significance at the 10% level; ** indicates significance at the 5% level; *** indicates significance at the 1% level. . The default categories are 101 to 200 employees; brick industry; mixed settlement groups; in the North West.

Appendix C3. OLS Estimates of Real Wage Increases

Independent variables	Whole Sample	1979-1983	1987-91	1991-95	1996-2000
Up to 25 employees	-0.111** (0.054)	0.122 (0.160)	-0.122 (0.114)	0.080 (0.071)	-0.222*** (0.079)
26 - 50 employees	-0.204*** (0.054)	0.003 (0.154)	-0.410*** (0.103)	-0.056 (0.068)	-0.154** (0.073)
51 - 100 employees	-0.081 (0.050)	0.102 (0.143)	-0.220** (0.095)	-0.078 (0.065)	-0.063 (0.073)
201-500 employees	-0.030 (0.051)	-0.059 (0.143)	0.016 (0.090)	-0.028 (0.063)	-0.023 (0.074)
More than 500 employees	0.183*** (0.051)	0.231 (0.159)	0.238** (0.095)	0.126* (0.065)	0.041 (0.074)
Scotland	0.090 (0.063)	0.241 (0.186)	-0.254** (0.124)	0.120 (0.087)	0.165* (0.090)
North East	-0.142* (0.074)	-0.276 (0.210)	-0.291** (0.130)	0.060 (0.108)	-0.183* (0.105)
Yorkshire	-0.312*** (0.070)	-0.359* (0.187)	-0.303** (0.130)	-0.199* (0.102)	-0.252** (0.098)
East Midlands	-0.065 (0.071)	-0.106 (0.202)	-0.126 (0.145)	-0.072 (0.091)	-0.033 (0.092)
East Anglia	0.113 (0.087)	0.290 (0.267)	-0.179 (0.187)	-0.053 (0.112)	0.254* (0.140)
South East	0.078 (0.056)	0.240 (0.151)	-0.021 (0.115)	-0.010 (0.078)	0.337*** (0.084)
South West	-0.029 (0.070)	0.350* (0.207)	-0.454*** (0.136)	-0.224** (0.093)	0.056 (0.102)
West Midlands	-0.318*** (0.067)	-0.661*** (0.184)	-0.481*** (0.133)	-0.112 (0.092)	-0.136 (0.087)
Wales	-0.101 (0.082)	-0.097 (0.213)	-0.274 (0.171)	-0.118 (0.116)	0.170 (0.125)
Food, drink & tobacco	0.585*** (0.086)	1.100*** (0.231)	1.145*** (0.169)	0.487*** (0.117)	0.038 (0.108)
Chemicals	0.616*** (0.082)	0.806*** (0.226)	1.118*** (0.164)	0.500*** (0.115)	0.244** (0.100)

Appendix C3. OLS Estimates of Real Wage Increases, continued

Metals	-0.133	-0.517*	0.382**	0.350***	0.026
	(0.100)	(0.273)	(0.193)	(0.129)	(0.113)
Mechanical engineering	-0.187**	-0.713***	0.569***	0.141	-0.062
	(0.081)	(0.218)	(0.162)	(0.113)	(0.092)
Instrument engineering	0.066	-0.254	0.582***	0.220*	0.126
	(0.088)	(0.236)	(0.175)	(0.121)	(0.111)
Textiles	-0.100	-0.190	0.600***	0.118	-0.417***
	(0.101)	(0.271)	(0.189)	(0.132)	(0.123)
Paper & publishing	0.098	0.597**	0.331*	0.134	0.030
	(0.096)	(0.251)	(0.191)	(0.124)	(0.112)
Construction	0.217	N/a	-1.402***	-0.583**	0.909***
	(0.196)		(0.469)	(0.230)	(0.264)
Transport & Communications	0.517***	N/a	0.493**	0.238*	0.250**
	(0.098)		(0.220)	(0.132)	(0.119)
Distributive Trades	0.501***	N/a	0.376*	0.151	0.333***
	(0.096)		(0.201)	(0.135)	(0.117)
Insurance	1.267***	N/a	1.572***	1.009***	0.769***
	(0.108)		(0.218)	(0.151)	(0.146)
Prof. Services	0.831***	N/a	0.546**	0.421***	0.873***
	(0.093)		(0.221)	(0.127)	(0.117)
Leisure Services	0.309*	N/a	-0.252	0.131	0.246
	(0.162)		(0.330)	(0.239)	(0.204)
Misc. Services	0.434**	N/a	0.868*	0.413	-0.140
	(0.178)		(0.446)	(0.254)	(0.174)
Non-manuals	0.443***	0.819***	0.104	0.103*	0.257***
	(0.042)	(0.137)	(0.084)	(0.055)	(0.056)
Manuals	0.272***	0.481***	-0.085	-0.047	-0.039
	(0.043)	(0.135)	(0.082)	(0.055)	(0.057)
Unionised	-0.543***	-0.673***	0.159***	-0.063	-0.026
	(0.032)	(0.134)	(0.059)	(0.044)	(0.046)
Workplace change this year	0.293***	0.293**	0.715***	0.597***	0.442***
	(0.051)	(0.112)	(0.082)	(0.085)	(0.084)
Workplace change last year	-0.003	0.519***	-0.285***	-0.293***	-0.105
	(0.048)	(0.125)	(0.080)	(0.064)	(0.082)

Appendix C3. OLS Estimates of Real Wage Increases, continued

10% drop in employment last year	-0.008 (0.036)	-0.094 (0.128)	-0.237*** (0.068)	-0.224*** (0.048)	-0.100* (0.056)
Last time in dataset	-0.379*** (0.060)	-0.598*** (0.178)	0.026 (0.136)	-0.254*** (0.086)	-0.444*** (0.071)
Last time in & big fall in employment	0.150 (0.124)	0.104 (0.413)	-0.399* (0.233)	-0.003 (0.182)	0.148 (0.186)
No. of Obs.	30017	6386	6924	8317	6464
Constant	0.032	-1.639	-0.167	0.304**	0.563***
Adjusted R^2	5.24%	6.03%	5.54%	3.77	8.25%

* indicates significance at the 10% level; ** indicates significance at the 5% level; *** indicates significance at the 1% level. The default categories are 101 to 200 employees; brick industry; mixed settlement groups; the North West.

Appendix C4. Marginal Effects From Probit Regressions On Changes To Working Hours

Independent variables	Whole Sample	1979-1983	1987-91	1991-95	1996-2000
Up to 25 employees	0.008* (0.004)	0.009 (0.015)	-0.001 (0.009)	0.002 (0.005)	-0.003 (0.002)
26 - 50 employees	0.005 (0.004)	0.018 (0.015)	-0.012 (0.008)	-0.001 (0.005)	-0.003 (0.002)
51 - 100 employees	0.011*** (0.004)	0.025* (0.014)	0.008 (0.009)	0.000 (0.005)	0.001 (0.002)
201-500 employees	0.009** (0.004)	0.020 (0.015)	0.004 (0.009)	0.013** (0.006)	-0.003 (0.002)
More than 500 employees	0.002 (0.004)	0.005 (0.016)	-0.011 (0.008)	0.007 (0.006)	-0.001 (0.002)
Scotland	-0.007 (0.004)	0.010 (0.017)	-0.002 (0.011)	-0.005 (0.004)	-0.005** (0.002)
North East	-0.005 (0.005)	-0.016 (0.018)	0.032** (0.017)	-0.009* (0.004)	-0.002 (0.002)
Yorkshire	-0.005 (0.004)	-0.023 (0.015)	0.021 (0.015)	-0.002 (0.004)	-0.004 (0.002)
East Midlands	-0.004 (0.005)	-0.008 (0.017)	0.027* (0.017)	-0.006 (0.004)	-0.003 (0.002)
East Anglia	-0.006 (0.006)	0.001 (0.027)	0.009 (0.017)	-0.006 (0.005)	dropped
South East	0.007* (0.004)	-0.001 (0.014)	0.018* (0.011)	0.003 (0.004)	-0.003 (0.002)
South West	0.000 (0.005)	0.021 (0.020)	0.014 (0.014)	-0.005 (0.004)	-0.002 (0.003)
West Midlands	-0.000 (0.004)	0.008 (0.016)	0.009 (0.013)	-0.001 (0.005)	-0.001 (0.002)
Wales	-0.007 (0.005)	-0.023 (0.018)	0.002 (0.015)	-0.009 (0.004)	0.001 (0.004)
Food drink, tobacco	-0.005 (0.005)	-0.052*** (0.015)	0.025 (0.022)	0.016 (0.016)	0.001 (0.004)
Chemicals	-0.005 (0.005)	-0.028 (0.017)	0.024 (0.020)	0.012 (0.013)	-0.003 (0.002)

Appendix C4. Marginal Effects From Probit Regressions On Changes To Working Hours, continued

Metals	-0.009	-0.029	0.002	0.015	-0.005**
	(0.005)	(0.019)	(0.019)	(0.016)	(0.001)
Mechanical engineering	-0.006	-0.040**	0.008	0.016	-0.006**
	(0.005)	(0.017)	(0.016)	(0.013)	(0.002)
Instrument engineering	-0.010*	-0.049***	0.013	0.019	-0.005**
	(0.005)	(0.016)	(0.018)	(0.016)	(0.001)
Textiles	0.000	-0.046**	0.038*	0.023	-0.001
	(0.006)	(0.017)	(0.025)	(0.021)	(0.003)
Paper & publishing	-0.004	-0.033	0.009	0.010	-0.002
	(0.006)	(0.018)	(0.021)	(0.015)	(0.003)
Construction	-0.024	N/a	0.096	N/a	N/a
	(0.010)		(0.085)		
Transport & Communications	-0.027***	N/a	0.017	N/a	N/a
	(0.004)		(0.025)		
Distributive Trades	-0.024***	N/a	0.014	0.009	N/a
	(0.004)		(0.021)	(0.014)	
Insurance	-0.020***	N/a	0.044*	-0.003	N/a
	(0.005)		(0.028)	(0.009)	
Prof. Services	-0.036***	N/a	-0.001	-0.005	N/a
	(0.003)		(0.018)	(0.008)	
Leisure Services	-0.034**	N/a	N/a	N/a	N/a
	(0.006)				
Misc. Services	-0.020	N/a	N/a	N/a	N/a
	(0.011)				
Leisure & Miscellaneous services	N/a	N/a	-0.032	0.020	N/a
			(0.015)	(0.023)	
Construction & transport/comm's	N/a	N/a	N/a	-0.001	N/a
				(0.010)	
All services	N/a	N/a	N/a	N/a	-0.009***
					(0.002)
Manuals	-0.013***	0.003	0.000	-0.002	-0.000
	(0.003)	(0.012)	(0.007)	(0.003)	(0.002)

Appendix C4. Marginal Effects From Probit Regressions On Changes To Working Hours, continued

Non-manuals	-0.011***	0.003	-0.002	0.002	0.002
	(0.003)	(0.012)	(0.007)	(0.003)	(0.002)
Unionised	0.043***	0.005	0.050***	0.015***	0.010***
	(0.003)	(0.012)	(0.005)	(0.003)	(0.002)
Workplace change	0.018***	0.011	0.013*	0.011**	0.025***
	(0.004)	(0.010)	(0.008)	(0.005)	(0.009)
Workplace change last year	-0.005*	-0.017	-0.014**	0.004	0.005
	(0.003)	(0.011)	(0.007)	(0.004)	(0.004)
10% drop in employment last year	-0.011***	-0.041***	0.008	0.010***	-0.003*
	(0.003)	(0.010)	(0.007)	(0.004)	(0.002)
Last time in data set	0.003	-0.005	0.018*	0.003	0.002
	(0.004)	(0.014)	(0.011)	(0.005)	(0.003)
Last time in and big fall in emp.	0.012	0.089*	0.004	-0.006	dropped
	(0.011)	(0.053)	(0.018)	(0.006)	
No. of Obs.	30041	6390	6924	8317	6034
Log Likelihood	-5570.1394	-2343.8887	1458.6219	-739.5890	-319.7646
Pseudo R^2	5.33%	0.90%	4.59%	5.98%	15.21%
Predicted probability (at sample means)	0.040	0.120	0.050	0.015	0.005

* indicates significance at the 10% level; ** indicates significance at the 5% level; *** indicates significance at the 1% level. The default categories are 101 to 200 employees; brick industry; mixed settlement groups; the North West.

Appendix C5. Probit Regression Results on Changes to Working Hours

Independent variables	Whole Sample	1979-1983	1987-91	1991-95	1996-2000
Up to 25 employees	0.083*	0.047	-0.011	0.064	-0.267
	(0.044)	(0.072)	(0.088)	(0.118)	(0.184)
26 - 50 employees	0.061	0.085	-0.122	-0.030	-0.257
	(0.045)	(0.070)	(0.091)	(0.130)	(0.181)
51 - 100 employees	0.119***	0.122*	0.077	0.013	0.034
	(0.042)	(0.066)	(0.082)	(0.120)	(0.140)
201-500 employees	0.101**	0.096	0.035	0.273**	-0.205
	(0.043)	(0.069)	(0.083)	(0.112)	(0.163)
More than 500 employees	0.026	0.027	-0.108	0.162	-0.061
	(0.047)	(0.078)	(0.089)	(0.120)	(0.157)
Scotland	-0.080	0.050	-0.021	-0.170	-0.403**
	(0.052)	(0.084)	(0.113)	(0.136)	(0.189)
North East	-0.065	-0.084	0.259**	-0.337*	-0.178
	(0.063)	(0.101)	(0.119)	(0.183)	(0.230)
Yorkshire	-0.055	-0.123	0.179	-0.064	-0.348
	(0.056)	(0.086)	(0.115)	(0.146)	(0.216)
East Midlands	-0.046	-0.039	0.225*	-0.180	-0.230
	(0.059)	(0.091)	(0.124)	(0.163)	(0.223)
East Anglia	-0.072	0.005	0.078	-0.204	dropped
	(0.077)	(0.133)	(0.145)	(0.197)	
South East	0.074*	-0.007	0.168*	0.074	-0.200
	(0.044)	(0.070)	(0.095)	(0.112)	(0.163)
South West	0.003	0.101	0.121	-0.157	-0.108
	(0.057)	(0.091)	(0.119)	(0.154)	(0.213)
West Midlands	-0.001	0.038	0.084	-0.035	-0.089
	(0.051)	(0.080)	(0.115)	(0.136)	(0.179)
Wales	-0.084	-0.122	0.020	-0.316	0.059
	(0.066)	(0.104)	(0.142)	(0.194)	(0.220)
Food drink, tobacco	-0.056	-0.303***	0.211	0.311	0.046
	(0.069)	(0.104)	(0.162)	(0.250)	(0.203)
Chemicals	-0.060	-0.151	0.210	0.270	-0.192
	(0.064)	(0.098)	(0.150)	(0.237)	(0.188)

Appendix C5. Probit Regression Results on Changes to Working Hours, continued

Metals	-0.120 (0.075)	-0.160 (0.114)	0.016 (0.180)	0.298 (0.256)	-0.639** (0.254)
Mechanical engineering	-0.066 (0.060)	-0.208** (0.090)	0.071 (0.144)	0.339 (0.229)	-0.506** (0.195)
Instrument engineering	-0.123* (0.066)	-0.277*** (0.101)	0.115 (0.154)	0.367 (0.238)	-0.594** (0.251)
Textiles	0.002 (0.073)	-0.262** (0.112)	0.300* (0.165)	0.414 (0.262)	-0.059 (0.226)
Paper & publishing	-0.053 (0.074)	-0.179 (0.110)	0.085 (0.178)	0.217 (0.270)	-0.118 (0.221)
Construction	-0.378 (0.246)	N/a	0.594 (0.373)	N/a	N/a
Transport & Communications	-0.468*** (0.116)	N/a	0.144 (0.199)	N/a	N/a
Distributive Trades	-0.365*** (0.097)	N/a	0.124 (0.171)	0.192 (0.259)	N/a
Insurance	-0.300*** (0.101)	N/a	0.336* (0.175)	-0.085 (0.292)	N/a
Prof. Services	-0.669*** (0.096)	N/a	-0.014 (0.177)	-0.145 (0.256)	N/a
Leisure Services	-0.710** (0.282)	N/a	N/a	N/a	N/a
Misc. Services	-0.307 (0.220)	N/a	N/a	N/a	N/a
Leisure & Miscellaneous services	N/a	N/a	-0.436 (0.318)	0.362 (0.306)	N/a
Construction & transport/communication	N/a	N/a	N/a	-0.019 (0.286)	N/a
All services	N/a	N/a	N/a	N/a	-0.719*** (0.211)
Manuals	-0.150*** (0.032)	0.014 (0.058)	0.003 (0.068)	-0.055 (0.095)	-0.016 (0.139)

Appendix C5. Probit Regression Results on Changes to Working Hours, continued

Non-manuals	-0.132***	0.017	-0.016	0.047	0.101
	(0.034)	(0.060)	(0.069)	(0.094)	(0.139)
Unionised	0.478***	0.026	0.491***	0.350***	0.465***
	(0.028)	(0.059)	(0.053)	(0.070)	(0.119)
Workplace change	0.190***	0.053	0.120*	0.232**	0.707***
	(0.034)	(0.050)	(0.067)	(0.098)	(0.135)
Workplace change last year	-0.065*	-0.088	-0.152**	0.090	0.223
	(0.039)	(0.060)	(0.076)	(0.099)	(0.157)
10% drop in employment last year	-0.134***	-0.227***	0.073	0.230***	-0.258*
	(0.035)	(0.064)	(0.061)	(0.075)	(0.145)
Last time in data set	0.032	-0.026	0.161*	0.071	0.117
	(0.045)	(0.074)	(0.093)	(0.126)	(0.145)
Last time in and big fall in emp.	0.122	0.366*	0.041	-0.202	dropped
	(0.101)	(0.188)	(0.167)	(0.254)	
No. of Obs.	30041	6390	6924	8317	6034
Log Likelihood	-5570.1394	-2343.8887	1458.6219	-739.5890	-319.7646
Pseudo R^2	5.33%	0.90%	4.59%	5.98%	15.21%
Constant	-1.774	-1.019	-2.147	-2.576	-1.949

* indicates significance at the 10% level; ** indicates significance at the 5% level; *** indicates significance at the 1% level. The default categories are 101 to 200 employees; brick industry; mixed settlement groups; the North West.

Appendix C6. The Marginal Effects From Probit Regressions On Changes To Holidays

Independent variables	Whole Sample	1979-1983	1987-91	1991-95	1996-2000
Up to 25 employees	-0.003 (0.006)	-0.047*** (0.017)	0.005 (0.011)	-0.005 (0.005)	0.004 (0.007)
26 - 50 employees	0.007 (0.006)	0.004 (0.018)	0.006 (0.011)	-0.008 (0.005)	-0.001 (0.007)
51 - 100 employees	0.003 (0.005)	-0.009 (0.017)	0.004 (0.010)	-0.000 (0.006)	-0.005 (0.006)
201-500 employees	0.007 (0.006)	0.016 (0.018)	-0.001 (0.010)	-0.007 (0.005)	0.008 (0.008)
More than 500 employees	0.025*** (0.007)	-0.006 (0.020)	0.040 (0.013)	0.015** (0.007)	0.030 (0.010)
Scotland	-0.018*** (0.006)	0.029 (0.023)	-0.027** (0.009)	-0.012** (0.005)	-0.014** (0.005)
North East	0.003 (0.008)	-0.046* (0.024)	0.033** (0.017)	-0.004 (0.007)	0.001 (0.009)
Yorkshire	-0.020*** (0.006)	-0.073*** (0.019)	-0.024** (0.010)	-0.005 (0.006)	-0.008 (0.007)
East Midlands	-0.010 (0.007)	-0.035 (0.022)	0.008 (0.015)	-0.011 (0.006)	-0.000 (0.008)
East Anglia	-0.020** (0.008)	-0.045 (0.031)	-0.001 (0.016)	-0.008 (0.006)	-0.014 (0.006)
South East	-0.007* (0.006)	-0.019 (0.018)	-0.009 (0.010)	-0.018*** (0.004)	-0.001 (0.007)
South West	-0.008 (0.007)	0.049* (0.026)	-0.024** (0.010)	-0.018 (0.004)	-0.001 (0.008)
West Midlands	-0.026*** (0.006)	-0.061*** (0.019)	-0.017 (0.011)	-0.004 (0.006)	-0.021*** (0.004)
Wales	0.040*** (0.010)	0.095*** (0.029)	0.012 (0.017)	-0.001 (0.008)	0.026** (0.016)
Food, drink, tobacco	0.009 (0.009)	0.061** (0.031)	0.005 (0.016)	-0.001 (0.009)	-0.010 (0.007)
Chemicals	-0.024*** (0.007)	0.016 (0.029)	-0.045*** (0.009)	-0.025*** (0.004)	-0.020*** (0.005)

Appendix C6. The Marginal Effects From Probit Regressions On Changes To Holidays, continued

Metals	-0.043*** (0.006)	0.010 (0.032)	-0.059*** (0.006)	-0.028*** (0.003)	-0.018** (0.005)
Mechanical engineering	-0.052*** (0.006)	-0.029 (0.025)	-0.079*** (0.008)	-0.027*** (0.004)	-0.021*** (0.005)
Instrument engineering	-0.040*** (0.006)	0.015 (0.029)	-0.059*** (0.007)	-0.019*** (0.005)	-0.013* (0.006)
Textiles	0.034*** (0.011)	0.090*** (0.035)	0.013 (0.018)	-0.015* (0.006)	0.008 (0.012)
Paper & publishing	-0.002 (0.009)	-0.033 (0.029)	-0.032** (0.011)	-0.002 (0.009)	-0.008 (0.008)
Construction	N/a	N/a	N/a	N/a	N/a
Transport & Com.	N/a	N/a	N/a	N/a	N/a
Distributive Trades	-0.040*** (0.008)	N/a	-0.021 (0.013)	-0.012 (0.007)	-0.003 (0.009)
Insurance	-0.052*** (0.007)	N/a	-0.045*** (0.009)	-0.009 (0.008)	-0.009 (0.008)
Prof. Services	-0.049*** (0.006)	N/a	-0.036*** (0.010)	-0.005 (0.008)	-0.002 (0.009)
Leisure Services	-0.020 (0.018)	N/a	-0.016 (0.022)	0.022 (0.023)	-0.005 (0.014)
Misc. Services	-0.006 (0.022)	N/a	0.018 (0.034)	0.007 (0.019)	-0.004 (0.018)
Construction & transport/communication	-0.065*** (0.005)	N/a	-0.023 (0.013)	-0.011 (0.007)	-0.023*** (0.004)
Manuals	-0.014*** (0.004)	-0.007 (0.016)	-0.007 (0.008)	-0.003 (0.005)	0.003 (0.005)
Non-manuals	-0.030*** (0.004)	-0.040** (0.016)	-0.008 (0.008)	-0.005 (0.005)	-0.002 (0.005)
Unionised	0.081*** (0.004)	0.087*** (0.015)	0.013** (0.006)	0.017*** (0.004)	0.033*** (0.007)
Workplace change	0.035*** (0.005)	0.027** (0.013)	0.014 (0.009)	0.002 (0.006)	0.035*** (0.012)

Appendix C6. The Marginal Effects From Probit Regressions On Changes To Holidays, continued

Workplace change last year	-0.009* (0.005)	-0.055*** (0.014)	-0.006 (0.008)	0.013** (0.007)	-0.002 (0.007)
10% drop in employment last year	-0.023*** (0.004)	-0.037** (0.015)	-0.004 (0.007)	-0.001 (0.004)	-0.003 (0.004)
Last time in data set	-0.001 (0.006)	0.014 (0.020)	-0.009 (0.011)	-0.003 (0.006)	-0.007 (0.005)
Last time in and big fall in emp.	0.011 (0.014)	0.086 (0.057)	0.010 (0.024)	-0.010 (0.010)	0.003 (0.016)
No. of Obs.	30041	6390	6924	8317	6474
Log Likelihood	-9240.9211	-3444.2418	1745.4826	-1152.1208	-889.3860
Pseudo R^2	7.08%	3.11%	6.97%	6.19%	9.27%
Predicted probability (at sample means)	0.087	0.237	0.064	0.027	0.025

* indicates significance at the 10% level; ** indicates significance at the 5% level; *** indicates significance at the 1% level. The defaults are 101 to 200 employees; brick industry; mixed settlement groups; the North West.

Appendix C7. Probit Regressions of the Impact of Workplace Change on Changes to Holidays

Independent variables	Whole Sample	1979-1983	1987-91	1991-95	1996-2000
Up to 25 employees	-0.020 (0.036)	-0.160*** (0.061)	0.041 (0.082)	-0.088 (0.096)	0.065 (0.113)
26 - 50 employees	0.044 (0.036)	0.018 (0.059)	0.044 (0.084)	-0.148 (0.104)	-0.009 (0.121)
51 - 100 employees	0.018 (0.034)	-0.030 (0.056)	0.033 (0.081)	-0.002 (0.094)	-0.098 (0.118)
201-500 employees	0.046 (0.034)	0.050 (0.057)	-0.009 (0.082)	-0.131 (0.103)	0.131 (0.109)
More than 500 employees	0.146*** (0.036)	-0.021 (0.065)	0.282 (0.077)	0.205** (0.091)	0.391 (0.103)
Scotland	-0.119*** (0.041)	0.091 (0.071)	-0.254** (0.099)	-0.240** (0.107)	-0.306** (0.133)
North East	0.019 (0.048)	-0.158* (0.086)	0.229** (0.102)	-0.069 (0.125)	0.017 (0.157)
Yorkshire	-0.135*** (0.045)	-0.255*** (0.074)	-0.224** (0.108)	-0.091 (0.117)	-0.146 (0.146)
East Midlands	-0.068 (0.046)	-0.117 (0.077)	0.060 (0.110)	-0.203 (0.133)	-0.004 (0.132)
East Anglia	-0.141** (0.061)	-0.154 (0.114)	-0.010 (0.127)	-0.150 (0.145)	-0.307 (0.200)
South East	-0.046 (0.036)	-0.063 (0.060)	-0.073 (0.083)	-0.330*** (0.095)	-0.026 (0.117)
South West	-0.052 (0.046)	0.153* (0.079)	-0.224** (0.111)	-0.413 (0.132)	-0.017 (0.145)
West Midlands	-0.181*** (0.044)	-0.209*** (0.071)	-0.153 (0.106)	-0.075 (0.110)	-0.542*** (0.163)
Wales	0.221*** (0.048)	0.285*** (0.080)	0.088 (0.118)	-0.015 (0.133)	0.331** (0.147)
Food drink, tobacco	0.056 (0.054)	0.189** (0.093)	0.042 (0.122)	-0.018 (0.144)	-0.196 (0.176)
Chemicals	-0.161*** (0.052)	0.050 (0.090)	-0.459*** (0.118)	-0.601*** (0.148)	-0.474*** (0.165)

Appendix C7. Probit Regressions of the Impact of Workplace Change on Changes to Holidays, continued

Metals	-0.330***	0.032	-0.844***	-0.921***	-0.442**
	(0.061)	(0.101)	(0.166)	(0.217)	(0.196)
Mechanical engineering	-0.370***	-0.096	-0.867***	-0.595***	-0.459***
	(0.050)	(0.084)	(0.117)	(0.137)	(0.151)
Instrument engineering	-0.300***	0.048	-0.707***	-0.415***	-0.273*
	(0.055)	(0.090)	(0.130)	(0.147)	(0.164)
Textiles	0.191***	0.270***	0.098	-0.330*	0.122
	(0.057)	(0.098)	(0.127)	(0.170)	(0.167)
Paper & publishing	-0.013	-0.110	-0.321**	-0.035	-0.178
	(0.059)	(0.100)	(0.139)	(0.155)	(0.191)
Distributive Trades	-0.310***	N/a	-0.192	-0.232	-0.053
	(0.073)		(0.131)	(0.159)	(0.173)
Insurance	-0.436***	N/a	-0.521***	-0.170	-0.193
	(0.083)		(0.152)	(0.170)	(0.198)
Prof. Services	-0.391***	N/a	-0.367***	-0.088	-0.029
	(0.065)		(0.138)	(0.137)	(0.156)
Leisure Services	-0.141	N/a	-0.146	0.278	-0.097
	(0.135)		(0.222)	(0.228)	(0.287)
Misc. Services	-0.036	N/a	0.128	0.100	-0.078
	(0.144)		(0.229)	(0.251)	(0.358)
Construction & transport/comm's	-0.611***	N/a	-0.220	-0.206	-0.680***
	(0.086)		(0.150)	(0.160)	(0.213)
Manuals	-0.087***	-0.023	-0.058	-0.055	0.051
	(0.026)	(0.052)	(0.064)	(0.078)	(0.086)
Non-manuals	-0.186***	-0.131**	-0.065	-0.084	-0.038
	(0.028)	(0.055)	(0.064)	(0.076)	(0.084)
Unionised	0.499***	0.298***	0.108**	0.246***	0.448***
	(0.022)	(0.055)	(0.047)	(0.059)	(0.073)
Workplace change	0.201***	0.086**	0.104	0.027	0.423***
	(0.028)	(0.042)	(0.065)	(0.094)	(0.107)
Workplace change last year	-0.059*	-0.186***	-0.046	0.188**	-0.037
	(0.032)	(0.052)	(0.070)	(0.086)	(0.130)

Appendix C7. Probit Regressions of the Impact of Workplace Change on Changes to Holidays, continued

10% drop in	-0.155***	-0.125**	-0.030	-0.024	-0.049
employment last year	(0.028)	(0.053)	(0.059)	(0.068)	(0.081)
Last time in data set	-0.006	0.046	-0.079	-0.048	-0.132
	(0.036)	(0.063)	(0.094)	(0.100)	(0.108)
Last time in and big	0.068	0.257	0.078	-0.191	0.051
fall in emp.	(0.083)	(0.160)	(0.175)	(0.233)	(0.257)
No. of Obs.	30041	6390	6924	8317	6474
Log Likelihood	-9240.9211	-3444.2418	1745.4826	-1152.1208	-889.3860
Pseudo R^2	7.08%	3.11%	6.97%	6.19%	9.27%
Constant	-1.229***	-0.822***	-1.036***	-1.387	-1.754***

* indicates significance at the 10% level; ** indicates significance at the 5% level; *** indicates significance at the 1% level. The default categories are 101 to 200 employees; brick industry; mixed settlement groups; the North West.

Appendix C8. OLS Estimates of Real Wage Increases

Independent variables	Whole Sample	1979-1983	1987-91	1991-95	1996-2000
Up to 25 employees	-0.110** (0.054)	0.121 (0.160)	-0.120 (0.114)	-0.079 (0.070)	-0.221*** (0.079)
26 - 50 employees	-0.203*** (0.054)	0.001 (0.154)	-0.413*** (0.103)	-0.055 (0.068)	-0.153 (0.073)
51 - 100 employees	-0.082 (0.050)	0.101 (0.143)	-0.225** (0.095)	-0.080 (0.065)	-0.062 (0.073)
101 - 250 employees	-0.033 (0.051)	-0.061 (0.143)	0.011 (0.090)	-0.035 (0.063)	-0.021 (0.074)
251 -500 employees	0.179*** (0.051)	0.228 (0.159)	0.235** (0.095)	0.121* (0.065)	0.043 (0.074)
Scotland	0.088 (0.063)	0.245 (0.186)	-0.253** (0.124)	0.110 (0.087)	0.162* (0.090)
North East	-0.143* (0.074)	-0.273 (0.210)	-0.281** (0.130)	0.062 (0.108)	-0.188* (0.105)
Yorkshire	-0.311*** (0.070)	-0.356* (0.187)	-0.295** (0.130)	-0.199* (0.102)	-0.255*** (0.098)
East Midlands	-0.065 (0.071)	-0.106 (0.202)	-0.118 (0.145)	-0.069 (0.091)	-0.037 (0.092)
East Anglia	0.115 (0.087)	0.292 (0.267)	-0.167 (0.187)	-0.051 (0.112)	0.249* (0.140)
South East	0.078 (0.056)	0.242 (0.151)	-0.012 (0.115)	-0.008 (0.078)	0.334*** (0.084)
South West	-0.028 (0.070)	0.352* (0.207)	-0.443*** (0.136)	-0.217** (0.094)	0.052 (0.102)
West Midlands	-0.320*** (0.067)	-0.659*** (0.184)	-0.478*** (0.133)	-0.113 (0.093)	-0.139 (0.087)
Wales	-0.103 (0.082)	-0.099 (0.213)	-0.260 (0.172)	-0.113 (0.116)	0.168 (0.125)
Food, drink & tobacco	0.587*** (0.086)	1.102*** (0.232)	1.143*** (0.169)	0.484*** (0.116)	0.037 (0.108)
Chemicals	0.617*** (0.082)	0.806*** (0.226)	1.118*** (0.165)	0.497*** (0.115)	0.245** (0.100)

Appendix C8. OLS Estimates of Real Wage Increases, continued

Metals	-0.135 (0.100)	-0.518* (0.273)	0.382** (0.193)	0.345*** (0.128)	0.024 (0.113)
Mechanical engineering	-0.186** (0.081)	-0.713*** (0.218)	0.569*** (0.163)	0.141 (0.113)	-0.064 (0.092)
Instrument engineering	0.067 (0.088)	-0.255 (0.236)	0.579*** (0.175)	0.221* (0.121)	0.125 (0.111)
Textiles	-0.098 (0.101)	-0.190 (0.271)	0.598*** (0.190)	0.121 (0.132)	-0.419*** (0.123)
Paper & publishing	0.094 (0.096)	0.596** (0.252)	0.334* (0.192)	0.136 (0.124)	0.030 (0.112)
Construction	0.218 (0.196)	N/a	-1.398*** (0.471)	-0.582** (0.230)	0.912*** (0.264)
Transport & Communications	0.520*** (0.098)	N/a	0.492** (0.221)	0.240* (0.132)	0.249** (0.119)
Distributive Trades	0.504*** (0.096)	N/a	0.381* (0.201)	0.152 (0.135)	0.333*** (0.117)
Insurance	1.270*** (0.108)	N/a	1.573*** (0.218)	1.012*** (0.151)	0.767*** (0.146)
Prof. Services	0.830*** (0.093)	N/a	0.544** (0.221)	0.418*** (0.127)	0.873*** (0.117)
Leisure Services	0.314* (0.162)	N/a	-0.254 (0.330)	0.131 (0.238)	0.244 (0.204)
Misc. Services	0.428** (0.177)	N/a	0.861* (0.445)	0.401 (0.252)	-0.134 (0.173)
Non-manual	0.444*** (0.042)	0.820*** (0.137)	0.106 (0.084)	0.103* (0.055)	0.257*** (0.056)
Manual	0.270*** (0.043)	0.480*** (0.135)	-0.090 (0.082)	-0.049 (0.056)	-0.041 (0.057)
Unionised	-0.543*** (0.032)	-0.673*** (0.136)	0.157*** (0.059)	-0.062 (0.044)	-0.025 (0.046)
1 type of change	0.218*** (0.061)	0.300** (0.131)	0.586*** (0.098)	0.462*** (0.100)	0.466*** (0.100)
2 types of change	0.370*** (0.098)	0.219 (0.206)	0.873*** (0.140)	0.917*** (0.173)	0.500*** (0.171)

Appendix C8. OLS Estimates of Real Wage Increases, continued

3 types of change	0.560***	0.434	1.001***	0.663***	0.112
	(0.140)	(0.315)	(0.198)	(0.245)	(0.254)
Workplace change last year	-0.009	0.519***	-0.292***	-0.301***	-0.102
	(0.047)	(0.125)	(0.080)	(0.063)	(0.082)
Big fall in employment	-0.009	-0.095	0.237***	-0.224***	-0.100*
	(0.036)	(0.128)	(0.068)	(0.048)	(0.056)
Last time in data set	-0.379***	-0.596***	0.030	-0.255***	-0.445***
	(0.060)	(0.177)	(0.136)	(0.086)	(0.071)
Big fall in emp & last time in dataset	0.145	0.103	-0.412*	-0.001	0.150
	(0.124)	(0.413)	(232)	(0.182)	(0.185)
Constant	0.034	-1.639***	-0.168	0.307**	0.566***
No. of Obs.	30017	6386	6924	8317	6464
Adjusted R^2	5.27%	6.04%	5.62%	3.86	8.27%

* indicates significance at the 10% level; ** indicates significance at the 5% level; *** indicates significance at the 1% level. The defaults are 101 to 200 employees; brick industry; mixed settlement groups; the North West.

Appendix C9. The Marginal Effects from Probit Regressions on Changes to Working Hours

Independent variables	Whole Sample	1979-1983	1987-91	1991-95	1996-2000
Up to 25 employees	0.008* (0.004)	0.009 (0.015)	-0.001 (0.009)	0.003 (0.005)	-0.004 (0.002)
26 - 50 employees	0.005 (0.004)	0.017 (0.015)	-0.012 (0.008)	-0.001 (0.005)	-0.003 (0.002)
51 - 100 employees	0.011*** (0.004)	0.025* (0.014)	0.008 (0.009)	0.001 (0.005)	0.001 (0.002)
201-500 employees	0.009** (0.004)	0.019 (0.015)	0.004 (0.009)	0.013** (0.006)	-0.003 (0.002)
More than 500 employees	0.002 (0.004)	0.005 (0.016)	-0.011 (0.008)	0.007 (0.006)	-0.001 (0.002)
Scotland	-0.006 (0.004)	0.011 (0.018)	-0.002 (0.011)	-0.005 (0.004)	-0.004** (0.002)
North East	-0.005 (0.005)	-0.016 (0.018)	0.033** (0.017)	-0.009* (0.003)	-0.002 (0.003)
Yorkshire	-0.004 (0.004)	-0.023 (0.015)	0.021 (0.015)	-0.002 (0.005)	-0.004 (0.002)
East Midlands	-0.004 (0.005)	-0.008 (0.017)	0.028* (0.017)	-0.006 (0.004)	-0.003 (0.002)
East Anglia	-0.006 (0.006)	0.001 (0.027)	0.009 (0.017)	-0.006 (0.005)	dropped
South East	0.007* (0.004)	-0.001 (0.014)	0.019* (0.011)	0.003 (0.004)	-0.003 (0.002)
South West	0.000 (0.005)	0.021 (0.020)	0.014 (0.014)	-0.005 (0.004)	-0.001 (0.003)
West Midlands	-0.000 (0.004)	0.008 (0.016)	0.009 (0.013)	-0.001 (0.005)	-0.001 (0.002)
Wales	-0.007 (0.005)	-0.023 (0.018)	0.003 (0.015)	-0.009* (0.004)	0.001 (0.004)
Food drink, tobacco	-0.005 (0.005)	-0.052*** (0.015)	0.025 (0.022)	0.015 (0.016)	0.001 (0.004)
Chemicals	-0.005 (0.005)	-0.028 (0.017)	0.024 (0.020)	0.012 (0.013)	-0.003 (0.002)

Appendix C9. The Marginal Effects from Probit Regressions on Changes to Working Hours, continued

Metals	-0.009	-0.029	0.002	0.015	-0.005**
	(0.005)	(0.019)	(0.019)	(0.016)	(0.001)
Mechanical engineering	-0.006	-0.040**	0.008	0.016	-0.005**
	(0.005)	(0.016)	(0.016)	(0.013)	(0.002)
Instrument engineering	-0.010*	-0.049***	0.013	0.019	-0.005**
	(0.005)	(0.016)	(0.018)	(0.016)	(0.001)
Textiles	0.000	-0.046**	0.038*	0.023	-0.000
	(0.006)	(0.017)	(0.025)	(0.021)	(0.003)
Paper & publishing	-0.004	-0.033*	0.009	0.010	-0.002
	(0.006)	(0.018)	(0.021)	(0.015)	(0.003)
Construction	-0.024	N/a	0.097	N/a	N/a
	(0.010)		(0.085)		
Transport & Communications	-0.027***	N/a	0.017	N/a	N/a
	(0.004)		(0.026)		
Distributive Trades	-0.023***	N/a	0.014	0.009	N/a
	(0.004)		(0.021)	(0.014)	
Insurance	-0.020***	N/a	0.044*	-0.003	N/a
	(0.005)		(0.028)	(0.009)	
Prof. Services	-0.036***	N/a	-0.001	-0.005	N/a
	(0.003)		(0.018)	(0.008)	
Leisure Services	-0.033**	N/a	N/a	N/a	N/a
	(0.006)				
Misc. Services	-0.020	N/a	N/a	N/a	N/a
	(0.011)				
Leisure & Miscellaneous services	N/a	N/a	-0.032	0.020	N/a
			(0.015)	(0.023)	
Construction & transport/communication	N/a	N/a	N/a	-0.001	N/a
				(0.010)	
All services	N/a	N/a	N/a	N/a	-0.009***
					(0.002)
Manuals	-0.013***	0.003	0.000	-0.002	-0.000
	(0.003)	(0.012)	(0.007)	(0.003)	(0.002)

Appendix C9. The Marginal Effects from Probit Regressions on Changes to Working Hours, continued

Non-manuals	-0.011***	0.004	-0.002	0.002	0.002
	(0.003)	(0.012)	(0.007)	(0.003)	(0.002)
Unionised	0.043***	0.005	0.050***	0.015***	0.010***
	(0.003)	(0.011)	(0.005)	(0.003)	(0.004)
One workplace change	0.017***	0.010	0.012	0.014***	0.012**
	(0.004)	(0.012)	(0.010)	(0.007)	(0.007)
Two workplace changes	0.016***	0.000	0.010	-0.004	0.051***
	(0.007)	(0.018)	(0.014)	(0.007)	(0.024)
Three workplace changes	0.036***	0.042	0.027	0.023*	0.069***
	(0.011)	(0.031)	(0.022)	(0.018)	(0.038)
Workplace change last year	-0.006*	-0.017	-0.015**	0.004	0.005
	(0.003)	(0.011)	(0.007)	(0.004)	(0.004)
10% drop in employment last year	-0.011***	-0.041***	0.008	0.010***	-0.003*
	(0.003)	(0.010)	(0.007)	(0.004)	(0.002)
Last time in data set	0.003	-0.005	0.019*	0.003	0.002
	(0.004)	(0.014)	(0.012)	(0.005)	(0.003)
Last time in and big fall in emp.	0.011	0.088*	0.004	-0.006	dropped
	(0.011)	(0.053)	(0.018)	(0.006)	
No. of Obs.	30041	6390	6924	8317	6034
Log Likelihood	-5568.6163	-2343.116	1458.3594	-737.8367	-316.8158
Pseudo R^2	5.36%	0.92%	4.60%	6.21%	15.99%
Predicted probability (at sample means)	0.040	0.119	0.050	0.015	0.006

* indicates significance at the 10% level; ** indicates significance at the 5% level; *** indicates significance at the 1% level. The default categories are 101 to 200 employees; brick industry; mixed settlement groups; the North West.

Appendix C10. Probit Regressions on Changes to Working Hours

Independent variables	Whole Sample	1979-1983	1987-91	1991-95	1996-2000
Up to 25 employees	0.084* (0.044)	0.046 (0.072)	-0.012 (0.088)	0.070 (0.118)	-0.284 (0.186)
26 - 50 employees	0.061 (0.045)	0.084 (0.070)	-0.123 (0.091)	-0.026 (0.130)	-0.249 (0.180)
51 - 100 employees	0.118*** (0.042)	0.122* (0.066)	0.075 (0.082)	0.016 (0.120)	0.031 (0.140)
201-500 employees	0.099** (0.043)	0.093 (0.069)	0.034 (0.083)	0.280** (0.112)	-0.212 (0.164)
More than 500 employees	0.024 (0.047)	0.023 (0.078)	-0.108 (0.089)	0.167 (0.120)	-0.088 (0.159)
Scotland	-0.079 (0.052)	0.053 (0.084)	-0.019 (0.113)	-0.165 (0.137)	-0.390** (0.188)
North East	-0.064 (0.063)	-0.084 (0.101)	0.263** (0.119)	-0.341* (0.183)	-0.154 (0.231)
Yorkshire	-0.053 (0.056)	-0.121 (0.086)	0.183 (0.116)	-0.069 (0.146)	-0.313 (0.217)
East Midlands	-0.046 (0.059)	-0.040 (0.091)	0.227* (0.124)	-0.182 (0.164)	-0.225 (0.225)
East Anglia	-0.070 (0.077)	0.007 (0.133)	0.082 (0.145)	-0.208 (0.197)	dropped
South East	0.075* (0.044)	-0.006 (0.070)	0.171* (0.095)	0.068 (0.111)	-0.188 (0.162)
South West	0.005 (0.057)	0.102 (0.091)	0.125 (0.119)	-0.166 (0.154)	-0.105 (0.215)
West Midlands	-0.001 (0.052)	0.038 (0.080)	0.087 (0.115)	-0.033 (0.137)	-0.078 (0.181)
Wales	-0.084 (0.066)	-0.125 (0.104)	0.024 (0.142)	-0.323* (0.194)	0.064 (0.218)
Food drink, tobacco	-0.055 (0.069)	-0.301*** (0.104)	0.211 (0.162)	0.308 (0.250)	0.050 (0.205)
Chemicals	-0.059 (0.064)	-0.150 (0.098)	0.209 (0.150)	0.267 (0.237)	-0.194 (0.191)

Appendix C10. Probit Regressions on Changes to Working Hours, continued

Metals	-0.120	-0.162	0.020	0.301	-0.613**
	(0.075)	(0.114)	(0.180)	(0.257)	(0.256)
Mechanical engineering	-0.066	-0.208**	0.072	0.340	-0.477**
	(0.060)	(0.090)	(0.144)	(0.229)	(0.198)
Instrument engineering	-0.123*	-0.277***	0.115	0.367	-0.582**
	(0.066)	(0.101)	(0.154)	(0.239)	(0.255)
Textiles	0.004	-0.262**	0.297*	0.417	-0.033
	(0.073)	(0.112)	(0.165)	(0.262)	(0.229)
Paper & publishing	-0.055	-0.181*	0.086	0.219	-0.110
	(0.074)	(0.110)	(0.179)	(0.271)	(0.222)
Construction	-0.377	N/a	0.595	N/a	N/a
	(0.246)		(0.373)		
Transport & Communications	-0.466***	N/a	0.146	N/a	N/a
	(0.116)		(0.199)		
Distributive Trades	-0.363***	N/a	0.126	0.196	N/a
	(0.097)		(0.171)	(0.260)	
Insurance	-0.298***	N/a	0.337*	-0.084	N/a
	(0.101)		(0.175)	(0.293)	
Prof. Services	-0.669***	N/a	-0.013	-0.143	N/a
	(0.096)		(0.178)	(0.256)	
Leisure Services	-0.707**	N/a	N/a	N/a	N/a
	(0.282)				
Misc. Services	-0.309	N/a	N/a	N/a	N/a
	(0.220)				
Leisure & Miscellaneous services	N/a	N/a	-0.435	0.368	N/a
			(0.318)	(0.307)	
Construction & transport/comm's	N/a	N/a	N/a	-0.018	N/a
				(0.287)	
All services	N/a	N/a	N/a	N/a	-0.697***
					(0.213)
Manuals	-0.151***	0.013	0.003	-0.052	-0.018
	(0.032)	(0.058)	(0.068)	(0.095)	(0.140)
Non-manuals	-0.132***	0.018	-0.015	0.045	0.098
	(0.034)	(0.060)	(0.069)	(0.094)	(0.139)

Appendix C10. Probit Regressions on Changes to Working Hours, continued

Unionised	0.478***	0.026	0.492***	0.350***	0.468***
	(0.028)	(0.059)	(0.053)	(0.070)	(0.118)
One workplace change	0.175***	0.051	0.109	0.294***	0.446**
	(0.040)	(0.058)	(0.082)	(0.111)	(0.173)
Two workplace changes	0.164***	0.002	0.094	-0.108	0.970***
	(0.061)	(0.090)	(0.117)	(0.250)	(0.217)
Three workplace changes	0.318***	0.189	0.219	0.409*	1.101***
	(0.080)	(0.126)	(0.152)	(0.223)	(0.275)
Workplace change last year	-0.067*	-0.088	-0.156**	0.089	0.226
	(0.039)	(0.061)	(0.076)	(0.100)	(0.158)
10% drop in employment last year	-0.134***	-0.229***	0.072	0.228***	-0.233*
	(0.035)	(0.064)	(0.061)	(0.075)	(0.142)
Last time in data set	0.032	-0.025	0.162*	0.072	0.137
	(0.045)	(0.074)	(0.093)	(0.126)	(0.144)
Last time in and big fall in emp.	0.120	0.366*	0.039	-0.210	dropped
	(0.101)	(0.188)	(0.168)	(0.255)	
No. of Obs.	30041	6390	6924	8317	6034
Log Likelihood	-5568.6163	-2343.116	1458.3594	-737.8367	-316.8158
Pseudo R^2	5.36%	0.92%	4.60%	6.21%	15.99%
Constant	-1.774	-1.017	-2.150	-2.578	-1.971

* indicates significance at the 10% level; ** indicates significance at the 5% level; *** indicates significance at the 1% level. The default categories are 101 to 200 employees; brick industry; mixed settlement groups; the North West.

Appendix C11. The Marginal Effects from Probit Regressions on Concessions on Holidays

Independent variables	Whole Sample	1979-1983	1987-91	1991-95	1996-2000
Up to 25 employees	-0.003 (0.006)	-0.048*** (0.017)	0.005 (0.011)	-0.005 (0.005)	0.004 (0.007)
26 - 50 employees	0.007 (0.006)	0.003 (0.018)	0.006 (0.011)	-0.008 (0.005)	-0.001 (0.007)
51 - 100 employees	0.003 (0.005)	-0.010 (0.017)	0.004 (0.010)	0.000 (0.006)	-0.005 (0.006)
201-500 employees	0.008 (0.006)	0.016 (0.018)	-0.001 (0.010)	-0.007 (0.005)	0.009 (0.008)
More than 500 employees	0.025*** (0.007)	-0.005 (0.020)	0.040*** (0.013)	0.015** (0.007)	0.031*** (0.010)
Scotland	-0.018*** (0.006)	0.029 (0.023)	-0.028** (0.009)	-0.012 (0.005)	-0.015** (0.005)
North East	0.003 (0.008)	-0.044* (0.024)	0.032** (0.017)	-0.004 (0.007)	0.000 (0.009)
Yorkshire	-0.020*** (0.006)	-0.073*** (0.019)	-0.025** (0.010)	-0.005 (0.006)	-0.008 (0.006)
East Midlands	-0.010 (0.007)	-0.034 (0.022)	0.008 (0.015)	-0.011 (0.006)	-0.001 (0.007)
East Anglia	-0.020** (0.008)	-0.045 (0.031)	-0.002 (0.015)	-0.008 (0.007)	-0.014 (0.006)
South East	-0.007 (0.006)	-0.018 (0.018)	-0.009 (0.010)	-0.018*** (0.004)	-0.002 (0.007)
South West	-0.008 (0.007)	0.050** (0.027)	-0.024** (0.010)	-0.019*** (0.004)	-0.001 (0.008)
West Midlands	-0.026*** (0.006)	-0.059*** (0.019)	-0.018 (0.011)	-0.005 (0.006)	-0.021*** (0.004)
Wales	0.040*** (0.010)	0.099*** (0.029)	0.011 (0.016)	-0.001 (0.008)	0.026** (0.015)
Food drink, tobacco	0.009 (0.009)	0.060** (0.031)	0.005 (0.016)	-0.001 (0.009)	-0.010 (0.007)
Chemicals	-0.024*** (0.007)	0.015 (0.029)	-0.045*** (0.009)	-0.025*** (0.004)	-0.020*** (0.005)

Appendix C11. The Marginal Effects from Probit Regressions on Concessions on Holidays, continued

Metals	-0.043***	0.010	-0.060***	-0.027***	-0.018**
	(0.006)	(0.032)	(0.006)	(0.003)	(0.005)
Mechanical engineering	-0.052***	-0.030	-0.079***	-0.027***	-0.021***
	(0.006)	(0.025)	(0.008)	(0.004)	(0.005)
Instrument engineering	-0.041***	0.015	-0.059***	-0.019***	-0.013*
	(0.006)	(0.029)	(0.007)	(0.005)	(0.006)
Textiles	0.034***	0.089***	0.013	-0.015**	0.008
	(0.011)	(0.035)	(0.020)	(0.006)	(0.012)
Paper & publishing	-0.002	-0.031	-0.032**	-0.002	-0.009
	(0.009)	(0.029)	(0.011)	(0.009)	(0.008)
Distributive Trades	-0.041***	N/a	-0.021	-0.012	-0.004
	(0.008)		(0.012)	(0.007)	(0.009)
Insurance	-0.052***	N/a	-0.045***	-0.009	-0.010
	(0.007)		(0.009)	(0.008)	(0.008)
Prof. Services	-0.049***	N/a	-0.036***	-0.005	-0.002
	(0.006)		(0.010)	(0.008)	(0.009)
Leisure Services	-0.021	N/a	-0.017	0.022	-0.006
	(0.017)		(0.022)	(0.023)	(0.013)
Misc. Services	-0.005	N/a	0.017	0.008	-0.004
	(0.022)		(0.034)	(0.019)	(0.018)
Construction & transport/communication	-0.065***	N/a	-0.024	-0.011	-0.022**
	(0.005)		(0.013)	(0.007)	(0.004)
Manuals	-0.014***	-0.007	-0.007	-0.003	0.003
	(0.004)	(0.016)	(0.008)	(0.005)	(0.005)
Non-manuals	-0.030***	-0.040**	-0.008	-0.005	-0.002
	(0.004)	(0.016)	(0.008)	(0.005)	(0.005)
Unionised	0.081***	0.087***	0.013**	0.017***	0.033***
	(0.004)	(0.015)	(0.006)	(0.004)	(0.007)
One workplace change	0.042***	0.040**	0.014	0.009	0.053***
	(0.007)	(0.016)	(0.011)	(0.008)	(0.017)
Two workplace changes	0.032***	0.017	0.024	-0.008	0.014
	(0.010)	(0.024)	(0.017)	(0.009)	(0.017)

Appendix C11. The Marginal Effects from Probit Regressions on Concessions on Holidays, continued

Three workplace changes	0.007 (0.013)	-0.035 (0.033)	-0.005 (0.021)	-0.014 (0.011)	-0.013 (0.013)
Workplace change last year	-0.008* (0.005)	-0.054*** (0.014)	-0.005 (0.008)	0.014** (0.007)	-0.002 (0.007)
10% drop in employment last year	-0.023*** (0.004)	-0.037** (0.015)	-0.004 (0.007)	-0.002 (0.004)	-0.003 (0.004)
Last time in data set	-0.001 (0.006)	0.014 (0.020)	-0.009 (0.011)	-0.003 (0.006)	-0.007 (0.005)
Last time in and big fall in emp.	0.012 (0.014)	0.086 (0.057)	0.011 (0.024)	-0.010 (0.010)	0.004 (0.017)
No. of Obs.	30041	6390	6924	8317	6474
Log Likelihood	-9237.7473	-3442.1748	1744.8049	-1150.5987	-886.6084
Pseudo R^2	7.11%	3.17%	7.00%	6.31%	9.55%
Predicted probability (at sample means)	0.087	0.237	0.064	0.027	0.025

* indicates significance at the 10% level; ** indicates significance at the 5% level; *** indicates significance at the 1% level. The default categories are 101 to 200 employees; brick industry; mixed settlement groups; the North West.

Appendix C12: Probit Regressions on Changes to Holidays

Independent variables	Whole Sample	1979-1983	1987-91	1991-95	1996-2000
Up to 25 employees	-0.021 (0.036)	-0.162*** (0.062)	0.040 (0.082)	-0.086 (0.095)	0.069 (0.114)
26 - 50 employees	0.043 (0.036)	0.009 (0.059)	0.046 (0.084)	-0.146 (0.104)	-0.009 (0.122)
51 - 100 employees	0.018 (0.034)	-0.032 (0.056)	0.034 (0.081)	0.003 (0.094)	-0.095 (0.119)
201-500 employees	0.047 (0.034)	0.052 (0.057)	-0.010 (0.082)	-0.121 (0.102)	0.138 (0.110)
More than 500 employees	0.149*** (0.036)	-0.017 (0.065)	0.282*** (0.077)	0.212** (0.092)	0.401*** (0.103)
Scotland	-0.118*** (0.041)	0.092 (0.071)	-0.257** (0.099)	-0.235 (0.107)	-0.316** (0.134)
North East	0.020 (0.048)	-0.149* (0.086)	0.225** (0.102)	-0.071 (0.125)	0.006 (0.157)
Yorkshire	-0.135*** (0.045)	-0.255*** (0.074)	-0.229** (0.108)	-0.092 (0.117)	-0.156 (0.146)
East Midlands	-0.067 (0.046)	-0.114 (0.077)	0.059 (0.110)	-0.206 (0.133)	-0.013 (0.132)
East Anglia	-0.141** (0.061)	-0.154 (0.114)	-0.015 (0.127)	-0.154 (0.145)	-0.315 (0.201)
South East	-0.046 (0.036)	-0.060 (0.059)	-0.076 (0.083)	-0.332*** (0.094)	-0.032 (0.118)
South West	-0.052 (0.046)	0.156** (0.079)	-0.226** (0.111)	-0.420*** (0.133)	-0.019 (0.145)
West Midlands	-0.180*** (0.043)	-0.204*** (0.071)	-0.154 (0.106)	-0.077 (0.111)	-0.548*** (0.162)
Wales	0.222*** (0.048)	0.295*** (0.081)	0.083 (0.119)	-0.017 (0.133)	0.332** (0.148)
Food drink, tobacco	0.054 (0.054)	0.185** (0.093)	0.040 (0.122)	-0.014 (0.144)	-0.204 (0.176)
Chemicals	-0.162*** (0.052)	0.047 (0.090)	-0.460*** (0.118)	-0.599*** (0.148)	-0.477*** (0.164)

Appendix C12: Probit Regressions on Changes to Holidays, continued

Metals	-0.329***	0.033	-0.850***	-0.915***	-0.457**
	(0.061)	(0.102)	(0.167)	(0.217)	(0.197)
Mechanical	-0.370***	-0.097	-0.868***	-0.593***	-0.475***
engineering	(0.050)	(0.084)	(0.117)	(0.136)	(0.151)
Instrument	-0.300***	0.047	-0.709***	-0.417***	-0.287*
engineering	(0.055)	(0.090)	(0.129)	(0.147)	(0.163)
Textiles	0.190***	0.268***	0.094	-0.335**	0.119
	(0.057)	(0.098)	(0.127)	(0.170)	(0.167)
Paper & publishing	-0.010	-0.103	-0.324**	-0.029	-0.180
	(0.059)	(0.101)	(0.139)	(0.155)	(0.191)
Distributive Trades	-0.312***	N/a	-0.194	-0.233	-0.066
	(0.073)		(0.131)	(0.160)	(0.173)
Insurance	-0.438***	N/a	-0.522***	-0.173	-0.209
	(0.083)		(0.152)	(0.170)	(0.199)
Prof. Services	-0.390***	N/a	-0.367***	-0.084	-0.039
	(0.065)		(0.138)	(0.137)	(0.156)
Leisure Services	-0.144	N/a	-0.149	0.277	-0.122
	(0.135)		(0.222)	(0.229)	(0.288)
Misc. Services	-0.033	N/a	0.125	0.122	-0.072
	(0.144)		(0.229)	(0.251)	(0.358)
Construction &	-0.615***	N/a	-0.223	-0.209	-0.685**
transport/comm's	(0.086)		(0.150)	(0.160)	(0.213)
Manuals	-0.086***	-0.023	-0.057	-0.051	0.049
	(0.026)	(0.052)	(0.064)	(0.077)	(0.087)
Non-manuals	-0.187***	-0.134**	-0.066	-0.084	-0.041
	(0.028)	(0.055)	(0.064)	(0.076)	(0.084)
Unionised	0.499***	0.301***	0.108**	0.246***	0.453***
	(0.022)	(0.055)	(0.047)	(0.058)	(0.073)
One workplace	0.235***	0.126**	0.102	0.128	0.557***
change	(0.032)	(0.049)	(0.077)	(0.107)	(0.122)
Two workplace	0.181***	0.055	0.169	-0.147	0.197
changes	(0.049)	(0.075)	(0.111)	(0.189)	(0.212)
Three workplace	0.044	-0.117	-0.044	-0.293	-0.318
changes	(0.075)	(0.118)	(0.176)	(0.313)	(0.431)

Appendix C12: Probit Regressions on Changes to Holidays, continued

Workplace change last year	-0.055* (0.032)	-0.183*** (0.052)	-0.042 (0.070)	0.197** (0.086)	-0.035 (0.131)
10% drop in employment last year	-0.155*** (0.028)	-0.122** (0.053)	-0.029 (0.059)	-0.025 (0.068)	-0.053 (0.081)
Last time in data set	-0.006 (0.036)	0.044 (0.063)	-0.079 (0.094)	-0.048 (0.100)	-0.139 (0.109)
Last time in and big fall in emp.	0.073 (0.083)	0.258 (0.161)	0.084 (0.175)	-0.188 (0.233)	0.073 (0.257)
No. of Obs.	30041	6390	6924	8317	6474
Log Likelihood	-9237.7473	-3442.1748	1744.8049	-1150.5987	-886.6084
Pseudo R^2	7.11%	3.17%	7.00%	6.31%	9.55%
Constant (at sample means)	-1.230	-0.825	-1.033	-1.394	-1.742

* indicates significance at the 10% level; ** indicates significance at the 5% level; *** indicates significance at the 1% level. The defaults are 101 to 200 employees; brick industry; mixed settlement groups; the North West.

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