

**THE IMPACT OF
WORKPLACE HUMAN RESOURCE MANAGEMENT PRACTICES
ON COMPANY AND EMPLOYEE PERFORMANCE
IN BRITAIN**

by

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DECLARATION

I declare that this thesis entitled "*The Impact of Workplace Human Resource Management Practices on Company and Employee Performance in Britain*" is my own work. It has not been submitted in any form for the award of a higher degree elsewhere.

Alina Petrescu

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ABSTRACT

Spanning thirteen years of British employee relations, and using three datasets with a total of over 80,000 observations, this thesis comprises three empirical studies of workplace practices. It focuses on the impact of Human Resource Management (HRM) practices on employee job satisfaction and on work effort, as well as analysing the relationship between training and promotion. Subjective constructs are deployed, positioning this research at the forefront of modern Labour Economics, while also attempting to bridge the HRM and Labour Economics literature. Original results include: the discovery of a consistently high and positive impact of employer-encouraged training and learning on job satisfaction and employee effort; the study of effort intensity; a contribution towards the setting of a research framework on effort; the use of a matched employee-employer data to analyse workplace employment relations; an inter-temporal analysis of training and promotion; the finding that returns to training in the extant literature are biased upward; and the finding that training and promotion with the same employer are positively associated. Several human resource management practices - in particular job autonomy, employee involvement and pay negotiation - and perceptions of pay inequality have highly significant effects on job satisfaction. Additionally, the thesis determines sets of practices that could lead to higher employee and workplace effort. The research agenda supported by this thesis can contribute to a more satisfactory and performance-enhancing workplace environment, hence to creating a stronger economy and to the achievement of higher societal well-being.

CHAPTER I

INTRODUCTION

1.1. Thesis sources of originality and main contributions

This thesis aims to increase the current understanding of the relationship between workplace practices, company performance and employee behaviour, which is a hitherto under-researched area. It investigates what practices work from the perspective of the manager, of employees, and of both, in order to increase job satisfaction, employee and workplace effort, and the likelihood of being trained and promoted. The thesis offers benefits to practitioners who can then attempt to motivate employees better and increase employee and company / workplace productivity.

The thesis attempts to open novel interdisciplinary paths of research by aiming to bridge the HRM and Labour Economics fields. This is done via positioning the three empirical studies on the border of HRM and Labour Economics, for instance with regard to the selection and classification of HRM practices, or with regard to the study of intensive effort. Moreover, the use of subjective measures adds to a developing area in Labour Economics, placing this thesis at the forefront of modern Labour Economics.

Original and noteworthy results show that several human resource management practices, in particular training, employee involvement, job autonomy and pay negotiation, have highly significant positive effects on job satisfaction. An original find is the discovery of a strong positive impact on job satisfaction obtained if

employers encourage training and learning. This contributes to a previously under-research area in the literature, concerning the impact of training on job satisfaction.

In the second empirical chapter, sets of practices that could lead to higher work effort are determined. They include a complementary set of four practices which comprises training, consultation, performance-related pay and job autonomy. This chapter contributes to the study of effort by sourcing and presenting the main theoretical and empirical developments that can generate a framework of research; this input is much needed to research on effort which is a complex and unclear area. The single largest impact on workplace effort comes from workplaces having pay equality, setting competency standards and using customer surveys. Supervision practices also have a positive impact on effort, but, in isolation, they can only have a limited influence on employee and workplace effort.

Finally, the third empirical chapter finds support for the hypothesis that British employers 'cherry pick' their promotion candidates by offering training to those whom they intend to promote. An original finding is that returns to training in the extant literature are biased upwards due to other studies conflating training with promotion. Furthermore, this finding is obtained as a direct result of conducting an original analysis of the time dimensionality for training and effort. This looks at when training and promotion occur, and the way they precede or succeed each other within the employment relationship with the same or the previous employer.

The thesis highlights not only sources of success but also potential pitfalls. Amongst the latter, an original insight is that a continuity of progress in HRM

practices, whereby more modern / advanced HRM practices would have a higher impact on organisational outcomes, cannot be assumed. Moreover, a perception of pay inequality as being too high or a perception of relative income as being too low have highly significant negative effects on job satisfaction. With regard to effort, not implementing learning or training in the workplace can decrease the likelihood of employees working hard.

The value added by this research in Labour Economics is high through the fact that it constitutes an empirical study in Labour Economics. According to Lazear (1998), Labour Economics has only relatively recently benefited from firm-level data, which means that empirical studies are very welcome.

Additionally, this thesis looks at employee data, which is matched with employer data when possible, thus allowing the employees' perspective to be seen. For instance, an original approach is based on combining the employees and management's views on effort to generate a composite measure of effort. Then it analyses the impact of HRM practices on the combined and separate views of the employee and managerial-reported work effort

The data used comes from three nationally representative studies, spanning a period of more than a decade in the history of employee relations in Britain (1993 – 2001) with a total of over 80,000 observations: the *Workplace Employment Relations Survey 1998* with around 20,000 employee-employer matched observations; *Changing Employment Relationships, Employment Contracts and the Future of Work 2000* with

over 2,000 employee observations; and the *British Household Panel Survey*, waves 1991-2003, with 60,000 multi-spell observations collected from 11,000 employees.

1.2. The study of HRM practices and research conducted in this thesis

Sharply rising competition in world and domestic markets during the past two decades has put increasing pressure on British firms to increase employee and company performance. In response to the interest in the importance of Human Resource Management (HRM) practices as tools to increase productivity, there has been an expansion in HRM and labour economics research focused on understanding the role of HRM practices in the workplace. Due to the accelerating rate of change in the workplace, existing studies constantly need to be updated with new research. More profoundly, there is a need for research that delves deeper into the role and scope of HRM practices in influencing workplace attitudinal variables such as job satisfaction with pay or with job autonomy, or employee effort.

In the past two decades it has been argued that changes observed in organisations are part of a transfer from the previous Personnel Management (PM) to a new management system labelled Human Resource Management (HRM) (Guest 1987). Attention has gradually turned more towards welcoming changes on a scale that makes contemporary authors write about a 'new agenda' of HRM (Sparrow and Marchington 1998). On a continual basis, in both practice and managerial literature of the latter part of the twentieth century, a better understanding and utilisation of human resources is considered crucial for reaching key business objectives, such as achieving

excellence (Peters and Waterman 1982) or creating a competitive advantage, known also as ‘competitive edge’ (Guest 1987, Legge 1995).

The field of workplace practices and the extent and spread of change remain one of the most controversial issues in organisational analysis and labour economics (Appelbaum and Batt 1994, Ichniowski *et al* 1996, Cully *et al* 1998, Bacon and Storey 2000, Millward 2000). On the one hand, when comparing HRM to PM, both labour economics and organizational behaviour research conclude that there are distinguishable features, particular to HRM. For instance, HRM is found to aim more at the individual than the collective. It employs workplace practices, such as methods of direct communication, employee involvement, appraisal systems and performance-related pay (Cully *et al* 1999, or Bacon and Storey 2000). On the other hand, neither labour economics nor behaviour in organisation studies on HRM manage to converge to a theory or definition of HRM practices.

This theoretical uncertainty fuels the debate around the metamorphosis of workplace practices from the ‘industrial relations’ to the ‘employee relations’ stage. Moreover, it makes it difficult, if not impossible, to compare research on HRM practices, because of the lack of a unified set of measures and definitions.

Instead, it is easier to identify a number of alternative workplace practices, analysed in ‘consistent wholes’ by Kling (1995), in ‘bundles’ by Black and Lynch (2001), as ‘clusters’ by Ichniowski *et al* (1997) or tested as ‘bundling hypothesis’ in Leigh and Gill (1999) – which are adopted in different sectors of the British economy. Furthermore, the 1998 Workplace Employment Relations Survey (WERS 98) reports

on the changes that have taken place in British workplace practices, mentioning the need for more research ‘that might help to shed light on the profusion of these practices across British workplaces’ (WERS 98 online, User Guide, Vol. 2 : 4).

This thesis starts with a review of the HRM practices from both a labour economics and a human resource perspective, presented in Chapter II. This critical and comprehensive review sets up the scene for the empirical analysis performed, and highlights the need for further research. It is observed that managers and employees frequently combine workplace practices drawn from very different work systems to create a new model they hope will lead to improved efficiency or quality. Several recent approaches to organising and managing work have been used with apparent success inside national economies, generating worldwide managerial attempts to import and adopt them (Appelbaum and Batt 1994). For example, Japanese-originating quality circles, teamwork and continuous improvement have generated in America one of the most highly-publicised transformations in workplace practices and performance in the 1980s: the New United Motors Manufacturing Industries (NUMMI) under the paradigm of ‘management-by-stress’ (Parker and Slaughter 1988, Ichniowski *et al* 1996).

More specifically, there is an entrenched trend in the labour economics literature, both theoretical and empirical, but mainly empirical and with a noticeable presence of American based research, emphasising the multifaceted influence of ‘new’ (‘innovative’, high-performance’) workplace practices on either employee or employer / company performance (Parker and Slaughter 1988, Osterman 1994a, Appelbaum and

Batt 1994, Kling 1995, Parks 1995, Ichniowski *et al* 1996 and 1997, Black and Lynch 1998 and 2004, Leigh and Gill 1999, Askenazy 2001, Delaney and Godart 2001).

In parallel, British research in the field of employee relations and (high-performance) workplace practices is well-established through studies such as Heywood *et al* 1997, Poole and Jenkins 1998, Whitfield 2000, Addison *et al* 2000 and 2001, Delbridge and Whitfield 2001. British research is joined, substantiated and fuelled by the government funded Workplace Industrial Relations Survey (WIRS) series in 1980, 1984, 1990, with a change of name to Workplace Employment Relations Survey (WERS) in 1998 and 2004. The series, but in particular WERS 98, is the subject of extended analysis in studies such as Cully *et al* 1998, Marginson and Wood 2000, Millward *et al* 2000 or Millward 2001.

There is also a notable tendency towards studying the impact of new workplace practices on company performance, as opposed to employee performance. At first glance, this is evidenced by relatively fewer studies which focus on workplace practices' impact on the employees' side and individual performance. Examples are Rigano and Edwards 1998, Leigh and Gill 1999, Adkins and Lury 1999, Galang 1999 or Ramsey *et al* 2000. This may be due to the relatively easier access to, transparency and objectivity of, data on companies, as opposed to the inherent subjectivity of data on employees. Thus, it is to be remarked that for the first time in the WIRS series, WERS 98 has included data on employees, and the survey's title was changed from Industrial Relations (IR) to Employment Relations (ER).

At the same time, the ways in which workplace practices contribute to performance have remained the subject of debate among academics, practitioners and policy makers. For instance, while Appelbaum and Batt 1994 report that ‘innovations still affect a minority of employees’ (1994:10), Osterman (1994a) finds results suggesting that between 20 and 25 percent of workers are affected by these changes. This is a much higher proportion than previously thought. Other examples of controversies in the field relate to the efficiency of using innovative workplace practices towards improving workplace health and safety (Askenazy 2001) or choosing and using indicators of performance measurement (Appelbaum and Bat 1994, Cully *et al* 1999).

Therefore, Chapters III – V form the foundation of the thesis and study the impact of workplace practices on both company and employee performance in Britain. The analysis is based on an interdisciplinary theoretical underpinning which attempts to synthesise the theoretical approaches in Economics, Industrial Relations and Behaviour in Organisations.

One of the main claims to original research stems from bringing to the fore the employee’s side of the story, to a greater extent than in the prevalent extant research framework. The theoretical underpinnings for each study, along with the specific methodology for the econometric models built in the thesis are presented within each chapter. The main assumption is that the presence of a set, or of an individual, HRM practice within an organisation can be ascertained from the questionnaires distributed in organisations.

In order to determine the impact of workplace practices on job satisfaction and work effort, as well as the link between training and promotion, three datasets are analysed: (a) Workplace Employment Relations Survey, 1998; (b) Changing Employment Relationships, Employment Contracts and the Future of Work, 2000; and (c) British Household Panel Survey, 1991-2003. The data used in this thesis has been obtained from the Data Archive University of Essex and has been made available for the purpose of this particular research.

Chapter III investigates the relationship between HRM practices, and workers' overall job satisfaction and their satisfaction with pay. Two British datasets are used here: the 'Changing Employment Relationships, Employment Contracts and the Future of Work Survey' and the 'Workplace Employment Relations Survey 1998'. After controlling for personal, job and firm characteristics, it is shown that several HRM practices raise workers overall job satisfaction and their satisfaction with pay, but these effects are only significant for non-union members. Satisfaction with pay is higher where performance-related pay and seniority-based reward systems are in place. A pay structure that is perceived to be unequal is associated with a substantial reduction in the union interaction differential for overall job satisfaction and their satisfaction with pay. Although HRM practices can raise worker job satisfaction, if workplace pay inequality widens as a consequence, then some non-union members may experience reduced job satisfaction.

Chapter IV aims to determine sets of practices that could lead to higher individual employee effort and managerial perception of workplace effort (the latter is shortly referred to hereafter as workplace effort), as well as looking at the impact of

these practices on supervision and quality monitoring. The cross-section British Workplace Employment Relations Survey 1998 has been chosen for this study as it has the advantage that responses are obtained from both employees and their managers. This advantage is used to assess which practices impact on employee or on workplace effort.

The conclusions drawn from Chapter IV suggest the HRM practices with a consistent positive impact on supervision and ways of monitoring work quality are: using competency standards and customer surveys. The main implications for practitioners, as well as for the research framework that future studies into the impact of supervision on effort could use, are as follows: (1) too much monitoring can be detrimental to effort; (2) some monitoring practices do not have a significant impact on employee and workplace effort; (3) there is considerable variation between practices that have an impact on individual effort and those that have an impact on the workplace effort; (4) there is considerable variation in impact of supervision HRM practices across sub-samples when data is split by sector and occupation; and, finally, (5) monitoring and supervision practices on their own may not be enough to ensure high levels of employee effort or positive changes in workplace effort (since coefficient sizes reported in this study are overall not very large).

Not enough support is found to suggest that more advanced practices have a higher impact on effort. This constitutes a warning for HRM practitioners and HRM researchers that HRM progress cannot be taken for granted i.e. those practices heralded to be the “most modern” or “the newest” are not necessarily having (the highest) impact on employee and workplace effort.

The HRM practices most likely to have an impact on individual effort comprise allowing for employee job control, consultation, performance related pay and employee-paid training. In fact, training and communication and consultation appear to have a strong and consistent impact on individual effort as well as workplace effort, while benchmarking and strategic planning play a major role in increasing workplace effort. Some practices which decrease the amount of supervised control, such as job autonomy, lead to decreases in individual effort, but working from home is associated with higher individual effort.

Chapter V focuses on two workplace practices, training and promotion. It uses a panel of individuals from the 13 waves of the British Household Panel Survey (1991-2003). Splitting the data by gender, sector and occupation, estimates for probit, bivariate probit and fixed effects models are obtained in order to analyse the determinants, interrelationships, and real wage impact of recent training and promotion.

The main finding is that training and promotion with the same employer are positively associated. Training also generates further training, especially if previous training was with the current employer. A noteworthy result, distinct from previous research, is that the gender discrimination with regard to training access is not observed in the panel based on BHPS data.

With regard to the determinants of current promotion, it is estimated that for both men and women training is significantly associated with the likelihood of promotion and that previous training, one to three years ago, is rather irrelevant for

recent promotion. Also, previous promotions (but mostly promotions with the current employer for males) generate further promotions. This chapter finds little evidence in support of the expectation that women are discriminated against with regard to promotion prospects with their current employer. The difference between the genders is modest. Results from a bivariate model that allows for endogeneity of training and promotion reinforce the findings from two independent probit models. The originality of this research lies in implementing a bivariate probit model, where the interdependence between training and promotion can be observed to point out higher impacts than univariate probit models.

An estimation of real wages as they change over time shows that recent training does not translate into important wage increases in the same period of time. Finally, with regard to returns to recent promotion, wage growth for promoted women is shown to only be lower than for promoted men in the case of women in professional occupations. Whereas both men and women enjoy positive returns to previous promotions awarded by the current employer, neither continue to experience a post-promotion wage effect contemporaneously if promoted with a previous employer one to two years ago.

Each of the Chapters II to V ends with a summary of the main points, following their respective conclusions section, which highlights the main findings. Chapter VI summarises the main conclusions of the thesis, discussing its limitations, the implications for practitioners and identifying issues for future research.

CHAPTER II

WORKPLACE MANAGEMENT PRACTICES: ECONOMICS AND HUMAN RESOURCE MANAGEMENT LITERATURE REVIEW

2.1. Introduction

Rising competition in world and domestic markets during the past two decades has put increasing pressure on British firms to adopt innovations in their work systems, in a similar way in which American firms had to respond to Japanese competitors.¹ Irrespective of whether performance *per se* is quoted, concern with performance is the cohesive feature of both a large array of organisational activities aimed at creating competitive advantage, and of academic research. In their continual search for progress and competitiveness, companies have to find alternative or innovative solutions to improve their businesses, for instance by increasing productivity or the quality of goods and services. Indeed, company managers around the world are preoccupied with performance issues and with an efficient way of employing human resource management (HRM) practices to achieve these goals. For instance, Baron and Kreps (1999) consider that:

‘...the main challenges that organisations are facing in pursuing total quality nowadays [...] concern the human resources’ (Baron and Kreps 1999 : 10).

¹ In the past decade, Asian markets are becoming increasingly competitive with skilled workforces and low wage economies.

In relation to the workforce, a conceptual objective of HRM (whether based on altruism or not) has habitually been framed as employees who are satisfied, productive, knowledgeable and committed to make use of their abilities and knowledge in the organisational benefit. In parallel to practitioner pursuits, a survey of the economic and HRM literature proves that, from an early stage in its development, research on company and employee performance has stressed the critical role of human resources (Arthur 1994; Huselid 1995; Ichniowski, Shaw and Prennushi 1997). Moreover, it may be that pressure for new HRM practices is greater when market competition is more intense.

Expectations placed on HRM peak when human resources are portrayed as the major key to organisational success or failure: 'success with poor HR policies is probably impossible, and the effects of improved HR policies on organizational success are potentially enormous' (Baron and Kreps 1999 : 4). Similarly, Pfeffer (1998) suggestively entitles his book on organisational success *The Human Equation*, implying in this sense that HRM helps organisations to adapt to increasing market demands by fine tuning their company practices with regard to a multitude of aspects such as skills, enhancing cooperation and teamwork, and productivity.

There is an expanding and highly analytical literature built on the hypothesis that HRM practices have an impact on organisational performance. Interest in studying performance has been especially growing in the 1990s (Cully *et al* 1999, Boselie *et al* 2001). A growing percentage of journal space is concerned with this topic. For instance two well-known journals, *Industrial Relations* 35(3) and the *Academy of Management Journal* 39 (4) have dedicated special issues to this topic in

1996. More recently, Brian Becker and Mark Huselid have edited a special issue of the *Human Resource Management* Volume 38(4) in 1999, presenting five case studies which explore strategic HRM and performance.

However, despite the extensive and interdisciplinary interest that the HRM-performance link has stirred, uncovering its more precise linkages and its functions remains a challenge for research on the topic. The ways in which workplace practices contribute to performance are a subject of debate among academics, practitioners and policy makers. For instance, some authors report that ‘innovations still affect a minority of employees’ (Appelbaum and Batt 1994 :10 reporting from US national level surveys during late 1980s and beginning of 1990s), while others find in their samples that much higher proportions of workers (between 20 and 25 percent) than previously thought are affected by workplace changes (Osterman 1994a).² Other examples of controversies in the field relate to the efficiency of using innovative workplace practices towards improving workplace health and safety (Askenazy 2001), or to choosing and using measures of performance (Appelbaum and Batt 1994, Cully *et al* 1999). The latter issue is discussed below in more depth.

In view of the need to advance knowledge, the aim of this thesis is to investigate in further detail the link between HRM, and employee and company performance. In particular, this chapter reviews empirical economic and HRM contributions to research on the impact of HRM workplace practices on company and employee performance. A comprehensive set of developments in the economics and

² Osterman’s (1994a) study is based on a sample of 694 US manufacturing establishments and data that has been collected in 1992.

HRM empirical literatures is critically presented, alongside some key empirical findings in more than two decades of research on performance.

This chapter is structured as follows. In Section 2.2, a discussion of challenges encountered in setting up the task of researching the HRM-performance relationship is presented. This section reflects upon the intricacies of thinking on this research topic, predominantly captured by the lack of consensus in the literature on measures of company / employee performance and HRM practices. Suggestions for taxonomies of performance measures and HRM measures which have so far been put forward in the literature are summarised. This section ends by reporting on the lack of consistency in research due to the unsystematic nature of studies on the HRM-performance relationship.

Section 2.3 looks at the extant research on the HRM-performance relationship. It focuses on some enduring research questions: are there differences between the 'old' and the 'new' practices?; what is the incidence of HRM practices?; what triggers the adoption or rejection of HRM practices?; and how do HRM practices impact on performance? In relation to the latter question, it highlights the impact of four types of HRM practices, which are most commonly investigated in the extant relevant literature, and are singled out in relation to their impact on company and employee performance: (1) financial incentives (e.g. profit-related pay); (2) labour-management communication; (3) training; and (4) high-commitment practices.

In Section 2.4, the conclusions, followed by a chapter summary, synthesise the main ideas exposed in this chapter.

2.2. Challenges in researching the HRM-performance relationship

In researching the HRM-performance relationship, the most prevalent methodological challenges arise from mainly two common directions: (1) inconsistency in the measurement of company / employee performance and HRM practices; (2) the unsystematic nature of the HRM-performance studies.

2.2.1. Inconsistent usage of measures of performance and HRM practices

The pervasiveness across studies of inconsistent and distorted measures of performance and HRM practices represents the major difficulty when attempting to summarise and advance research on the topic. This section looks first at performance measures and suggested taxonomies of performance measures in the literature, then continues with measures of HRM practices and suggested taxonomies of HRM practices in the literature.

2.2.1.1. Inconsistent usage of performance measures and taxonomy suggestions

Starting with performance measures, there is a large and confusing choice in the range of data that can be collected to report individual and company performance. This inconsistency has been a feature of performance studies from their emergence. Moreover, the variety of performance measures has continued to expand in the literature, stimulated by new management fads and further developments in organisations.

A preliminary point of controversy is that there is no consensus in defining performance in a way that is both conceptually sound and empirically functional. HRM is said to suffer from a 'crisis' of identity and confidence in that HR managers' results are 'almost impossible to measure and their successes and failures are largely the successes and failures of other people' (Torrington 1998 : 36).

An answer to why it is so hard to define a set of performance measures is that, as mentioned in the introduction of this chapter, companies have a multitude of activities, hence of objectives, which can all be seen as ultimately related to the quest for performance. It follows that researchers choose those measures that are more appropriate for their subjects, or work with those measures on which companies have collected data. It has been even suggested that finding an ideal performance evaluation system may be nearly impossible (Baron & Kreps, 1999).

Among the various measures of performance employed in the empirical literature, the following are the most common: productivity, profitability, growth, wastage, quality of goods or services, and financial performance (Arthur 1994, Huselid 1995, MacDuffie 1995, Delery and Doty 1996, Ichniowski, Shaw and Prensushi 1997). Industry-specific measures offer a temporary compromise to this problem (e.g. Ichniowski and 1999).

Faced with the issue of inconsistency, few authors have made attempts to classify performance measures. Additionally, questionnaire answers provided by

managers do not help to highlight particular sets of measures most likely to be used.³ Therefore, there is yet no clearly specified intent to draw up taxonomies for performance measures, possibly due to the vast amount of variation on the subject.

This review uses these rare occurrences of classifications in order to suggest some alternative points of departure for mapping variety in performance measures. Among the earliest attempts of this kind, Kleiner *et al* (1987) analyse extant research and group the performance outcomes most widely encountered into four main categories: labour quality, intermediate outputs, outputs, and outcomes (Appendix A.1). However, they caution that researchers using these outcomes made no endeavour to imply that improvements in labour quality and intermediate outputs result in improved outputs and outcomes. Admittedly, the lack of causality is due to researchers not having tried 'to disentangle the complex relationships that link these various measures' (ibid. 323).

Another taxonomy suggestion is made by Locke and Latham (1990): (a) measures of output of goods and services, which can be further divided into quantitative (units produced, clients served) or qualitative (complaints from clients); (b) measures of time (absenteeism, lateness, failure to meet deadlines, loss of working time); and (c) financial measures (profits, revenues). These measures can be combined into further composite performance indicators that are subsequently influenced by measures from different categories, though not necessarily connected to labour market outcomes. For example, productivity indicators may be composed of measures of time (such as hours of work) and quantitative measures of output of goods and services

³ There is however an emerging consensus in the literature that questionnaire design could be improved with regard to standardising answers provided by managers.

(numbers of units produced). Adding to this attempt, Guest (1997) suggests that where quantitative data is harder to obtain, measures of employee behaviour can be collected from alternative sources such as: (a) employee self-reports, (b) direct observations (e.g. whether the employees are approaching clients and offer to help); and (c) supervisors, peers or subordinate reports.

A more recent classification that can provide a starting point for a taxonomy is offered by Wright and Gardner (2000). The authors quote Rogers and Wright (1998) in their report of performance measures used in eighty empirical observations testing the HRM-performance relationship. The Rogers and Wright (1998) classification includes four categories of measures: (1) human resource performance (output per employee being the only employee performance measure found); (2) organizational performance (e.g., productivity, quality or customer satisfaction); (3) financial accounting performance (e.g., return on assets); and (4) financial market performance (e.g., stock price or Tobin's Q). Though it is questionable whether labour output can be used as a single indicator for human resource performance, the other measures of performance have been widely used in the empirical literature.

Several biases exist in performance studies. Preference is given to quantitative data collected on performance and especially to financial measures, for the reason that the prevalent way of assessing managers' performance is via financial measures. It has been noted that financial measures are given priority in the analytic framework for studying performance data which is usually 'starting with the "hard" measures, followed by behaviour, followed by reports or ratings' (Guest 1997 : 267).

Moreover, the field of performance studies is polarised towards American research, followed by more recent studies developed in the UK, Australia and Germany.

A separate but particularly noteworthy issue is that performance studies are biased towards researching company performance while neglecting employee behaviour. Guest *et al* (2000a) contend that studies ‘fail to explore the processes whereby HR practices may impact on employee attitudes and behaviour, and the possible influence of such attitudes on behaviour and performance.’ (ibid. 2). On this note, specific attempts were made to signal a ‘dearth of studies’ on the impact of HRM practices on employee outcomes (Wright and Gardner 2000 :17). At a first glance, this is evidenced by relatively fewer studies on the impact of HRM practices on employee performance. Examples are Rigano and Edwards (1998), Leigh and Gill (1999), Adkins and Lury (1999), Galang (1999) or Ramsey *et al* (2000). Appelbaum and Batt (1994) note that:

‘... overwhelmingly, the information in both the surveys and case studies comes from managers and consultants responsible for implementing changes, not from the employees experiencing them. The picture that emerges is necessarily one-sided and probably overstates the degree of innovation and change actually taking place. Managers rarely report failed efforts, and consultants rarely examine them in their reports, but undoubtedly there have been many’ (Appelbaum and Batt 1994 : 58).

The same opinions are shared by Cully *et al* 1999 with regard to the British WIRS series. Thus, it is to be remarked that for the first time in the British WIRS series, WERS 1998 has included data on employees, change which is conveyed by the

alteration of the survey title from Industrial Relations (IR) to Employee Relations (ER). An explanation for this bias in research may be the relatively easier access to, transparency and objectivity of, data on companies, as opposed to the inherent subjectivity of data on employees. This may also lead to a publication bias, as it is more likely that studies with successful results get reported.

2.2.1.2. Inconsistent usage of HRM practices measures and taxonomy suggestions

It is hard to derive a terminology that could receive researchers' general approval in terms of measuring HRM practices. For a start, there is not even a commonly agreed term to define the object of measurement in this case. Studies refer interchangeably and sometimes tautologically to 'HR(M)', 'work(place)' or 'organisation' / 'company' / 'employee', in combination with 'policies', 'practices', 'management (practices)' or 'systems'. Several adjectives, such as 'transformed', 'new', 'innovative', 'alternative' are unconditionally joined to the former series of terms, according to authors' free choice. Furthermore, the range of definitions varies with the discipline of the author (Parks 1995). Some congruence exists in the literature regarding the term 'high-performance practices', particularly when it is employed in the phrase 'high-performance work systems' (HPWS). As the term implies, it is suggested that practices under this denomination may have a positive influence on a certain measure of performance.

The term 'HRM practices' has been employed in this thesis, as it is considered to take the widest and most inclusive angle to company and employee

related practices. For the sake of conciseness, only ‘practices’ are mentioned, but the intention is to include and refer to practices as both modes of behaviour and policies defining or regulating their implementation. Additionally, the meaning of HRM practices is stretched to allow for the inclusion of practices that may be regarded as belonging to industrial relations. Terms that are more specific are employed when it is necessary to restrict the focus of ‘HRM practices’ to particular practices such as high-commitment or high-performance.

Similarly, there is no universal agreement over which sets of practices are exclusively and inexorably defined by the term ‘high-performance’. Practices that appear to be generally quoted as ‘high-performance’ are: employee involvement (also described as employee participation or employee voice), flexible work systems, job security, screening, training, and pecuniary or non-pecuniary incentive pay systems.⁴ However, in their turn, these practices may also appear under similar denominations, largely employed especially in the management literature but also beyond it. Thus, they may be enlisted as part of high-commitment or high-involvement practices. However, the term ‘high-performance’ has attracted intensive empirical research, hence it will be the second preferred term used in this thesis, especially when reporting results from empirical literature.

As with performance measurements, there is no unanimously accepted taxonomy of HRM practices in use, yet attempts to create classifications of HRM practices are more common. Since these attempts are often combined with, and used

⁴ This list does not aim to be exhaustive. It includes practices that could raise controversy in terms of being labelled ‘new’ and ‘innovative’ such as training. Moreover, there is a clear distinction between performance policies based on employee involvement, and those based on incentive pay systems.

for testing, the hypothesis that ‘bundles’ of HRM practices work better than individual HRM practices, these attempts are presented in the next section.

A feature of the empirical economic literature emphasised in this review is the emergent need for a taxonomy of HRM practices. Groups of HRM practices are given a variety of denominations and this leads to one of the main methodological challenges of understanding the HRM-performance relationship. However, there are more attempts to classify HRM practices than performance measures. The most common denomination that is applied to HRM practices in empirical research in order to refer to the link between HRM and performance, is ‘high performance practices’. Notably, however, there are no established criteria for when a practice should be denominated as ‘high performance’.

An inherent part of testing ‘bundling hypotheses’ is formed by attempts to create classifications of HRM practices. At its simplest, a classification made by Parks (1995) deserves attention because it introduces the concept of ‘workplace practices spectrum’ (Appendix A.2). The two extremes of this spectrum are ‘traditional’ and ‘alternative’ HRM practices. She acknowledges that there is no universal approval towards employing these precise terms. Bringing together literature from sociology, psychology, HRM and economics, Parks (1995) suggests that the two ends of the spectrum are best characterised by a set of key words mostly encountered in relation to traditional and alternative HRM practices. ‘High-performance practices’ are here considered to present most of the characteristics of the ‘alternative’ end of the spectrum.

Among the attempts to create a taxonomy of HR practices, the predominant type is a dual classification, for instance distinguishing between: (1) practices that affect work organisation, and (2) other human resource management practices that do not affect it (Osterman 1994a, MacDuffie 1995, Gittleman *et al* 1998). Arthur (1994) distinguishes between ‘commitment HR systems’ and ‘control HR systems’. Huselid (1995) refers to (1) employee skill and organisational structure practices (such as training, job design and information sharing), and (2) employee motivation practices (such as performance appraisal and incentive compensation).

Hunter and Hit (2001) illustrate a similar dual attempt to capture the meaning of ‘high-performance workplaces’ as separated from the other types of work organisation previously analysed in the literature (Appendix A.3). Here, the organisation of work is mainly separated into ‘Taylorist or traditional’, where workers perform a limited set of tasks while suspending their independent judgement, and ‘high-performance’ practices, where workers are multi-skilled, take part in the decision-making process and in job rotation. In this view, ‘high-performance practices’ have as main attributes high flexibility and high discretion, achieved through teamwork, job rotation, employee involvement in decision-making, and the integration of technology in production processes (Hunter and Hitt 2001:3).

In comparison to these two-layer classifications, Jalette (1997) analyses the impact of practices on performance at credit unions in Quebec, Canada and uses a three-layer classification. The summary of findings in this financial sector present three groups of practices that have improved performance: (1) mobilization practices, such as financial incentives, social activity committee, colloquium and employee suggestion

system; (2) employee voice, such as problem/grievance systems, labour-management communication, written specification of working conditions, health and safety committee and training committee; and (3) human resource development practices, such as training programmes, succession plans, performance appraisal and information meetings.

Becker and Gerhart's (1996) model, adapted by Wright and Gardner (2000), proposes a more in-depth classification of HRM practices on four layers of HRM complexity: (1) guiding principles; (2) policy/practice alternatives; (3) product; and (4) practice-processes. Appendix A.4 illustrates these four layers applied to the HRM practice of performance-based pay. Another four-layer taxonomy is used by Becker and Huselid 1998: (1) personnel; (2) alignment; (3) compensation; and (4) high performance.

Finally, one of the most detailed classifications of HRM practices is presented by Ichniowski *et al* (1997). Their hierarchy of four HRM systems of practices points to the differences across these systems as they evolve from the 'traditional HRM system' to the 'most innovative HRM system' (see Appendix A.5). This hierarchy is constructed by the authors and tested in their study which finds that the most innovative HRM system leads to the highest performance levels. Starting from the most basic system, HRM system 1 which is the "traditional" system, HRM practices are gradually added or improved until reaching the 'most innovative HRM system', HRM system 4. For instance, in HRM system 1 there is no teamwork; in HRM system 2 there is some initiation of teamwork; in HRM system 3 workplaces

adopt teamwork; and workplaces in HRM system 4 implement multiple problem-solving teams.

A major critique of attempts to create taxonomies is that each study tends to become particular to the technological context of research and the product / sector attributes which authors must consider. For instance, the predominance of manufacturing-based studies (for a chronological glimpse of this wide literature see Dean and Snell 1991, Snell and Dean 1992, Waterson *et al* 1999, Appelbaum *et al* 2000, Cua *et al* 2001, Shah and Ward 2003, Patterson *et al* 2004, Wood *et al* 2004, Wood 2005). Future research is yet to decide whether a clear-cut and non-industry specific taxonomy can be created and on how limited its application would be.

The considerable variation in the choice of both performance and HR practices measures makes it difficult for researchers to cumulate findings and draw conclusions. Becker & Gerhart (1996) note that this lack of replicability and standardisation of studies could be overcome if researchers decided upon a set of measures that they could design together. Nevertheless, a few examples of studies researching determinants and effects of HRM practices on company and employee performance are described in Section 2.3.

2.2.2. The unsystematic nature of HRM-performance studies

Research into the relationship between HRM practices and performance is unsystematic in many aspects, including level of analysis, data availability, data modelling in terms of variables used as determinants, the clarity of the effects of HRM

practices, choice of managerial implementation of HRM practices, and the HRM bundling hypothesis. Consequently, preventing subjective interpretation and judging the importance of information remain unresolved methodological issues.

To start with, there is the variation in the level of data analysis: company, establishment, firm etc. When the incoherent employment of a very large variety of measures highlighted above is combined with inconsistency, this leads to a lack of continuity in any particular line of research (Guest *et al* 2000a, Wright and Gardner 2000).

The challenge of establishing inter-relational links within extant research is fuelled by the coexistence of multiple levels of analysis (e.g. corporate, business or plant) and study designs (e.g. cross-sectional, intra industry, case study, meta-analysis). An in-depth analysis of research designs is given by Ichniowski *et al* (1996). More studies are needed at the business level, plant level or even at a level of analysis lower than that, rather than at the corporate level (Wright and Gardner 2000). Most likely, the lack of data is because in competitive circumstances like those faced by British organisations, data is especially sensitive and tends to be proprietary, being released mainly to consultancies or Government-backed surveys.

With an established tradition of access to good sources of data, American empirical research on the impact of HRM practices on company and employee performance is impressively rich (e.g. Parker and Slaughter 1988, Osterman 1994a, Appelbaum and Batt 1994, Kling 1995, Parks 1995, Ichniowski *et al* 1996 and 1997, Black and Lynch 2001 and 1998, Leigh and Gill 1999, Black and Lynch 2004,

Askenazy 2001, Delaney and Godart 2001). So, the literature is biased towards a noticeably larger presence of American based research. In parallel, British research in the field is also well-established, and very rigorously conducted, with an emphasis on utilising the WIRS series (e.g. Heywood *et al* 1997, Poole and Jenkins 1998, Whitfield 2000, Addison *et al* 2000, Addison and Belfield 2001, and Delbridge and Whitfield 2001). More British-based studies are needed.

To continue, there is a lack of coherence in the empirical economics literature on the determinants and effects of HRM practices on company and employee performance. In view of the several measurement inconsistencies signalled in this chapter so far, this does not come as a surprise.

With regard to analysing the determinants of HRM practices, understandably, each study attempts to make the best of the data available. Such data is sometimes scant or collected for different purposes other than the study (hence sometimes inappropriate). For instance, most surveys solicit a yes/no answer to whether a practice is implemented. Or, a more qualitative and inquisitive type of question could be asked, on the lines of 'how well have you implemented this practice?', 'how long has this practice been implemented by you?', 'to what extent has this practice been implemented in your organisation?', or 'to what extent do you believe this practice has made a difference to your organisation?'. However, there are no set models to be followed, whereby, for example, all studies should at least contain a certain set of control variables.

Furthermore, the incidence of some practices is dependent on firm or employee characteristics. Research under these contingent assumptions can be illustrated by three examples. Regarding firm characteristics, Frazis *et al* (1998) use the BLS 1995 Survey of Employer-Provided Training and find that the incidence of formal training depends positively on relative firm characteristics (such as larger size, lower turnover, use of contract workers and of ‘more alternative workplace practices’) and employee characteristics (more skilled workers are more likely to receive more training). Additionally, Black and Lynch (2001) suggest that practices may have a different impact on productivity depending on firm characteristics. Their results show that joint decision-making and incentive-based compensation work better in unionised than in non-unionised firms. On the same note, maintaining traditional labour management relations is more detrimental to productivity in unionised than in non-unionised businesses. The main critique of research contingent on firm characteristics is the extent to which they are conclusive to the particular HRM practices assessed.

With regard to analysing the effects of HRM practices on employees and companies, this is also often ambiguous and problematic. For an example evidencing the difficulties encountered, the hypothesis of HRM-union substitution can be put forward. Unlike the green light given by the management literature to this substitution as being beneficial for both manager and worker, some studies warn that companies may fake the advantage of union deregulation policies when selling such policies to their workforce. This could be done by pretending deregulation enables an advantageous focus on individualism with increased opportunities for employee voice expression. In this context, employee involvement is packaged as a desirable substitute for unionisation. However, Bacon and Storey (2000) conducted a three-year detailed

case study to explore the impact of the shift to partnerships and more individualised HR relations with employees in companies which previously used collectivised arrangements. In spite of some evidence that the 'new' arrangements were breaking with the past, these arrangements did not seem long-lasting, nor stable. Instead, both attempts at union de-recognition and secure partnership were fraught due to 'managers behaving in a short-term, contradictory and opportunist way' (Bacon and Storey 2000 : 423). The new arrangements have rather re-established the trade unions role and added to employee voice the dimension of forums, but all these arrangements remained 'firmly management-driven' (ibid : 424).

Moreover, there is random implementation of HRM practices by managers. Companies frequently combine HRM practices drawn from different work systems to create new models they hope will lead to improved efficiency or quality. The limitless possibilities of combining in-house and imported practices makes researchers' jobs even more complex. Among the recent approaches to organising and managing work, several have been used with apparent success inside national economies, generating worldwide managerial attempts to import and adopt them (Appelbaum and Batt 1994). For example, Japanese-originating quality circles, teamwork and continuous improvement have generated in America one of the most highly-publicised transformations in workplace practices and performance in the 1980s: the New United Motors Manufacturing Industries (NUMMI) (see Parker and Slaughter 1988, Ichniowski *et al* 1996 for further details).

A partial solution to the random managerial approach of implementing HRM practices could be researching the hypothesis put forward by the contingent

approach to HRM. The common theme implied by contingency theory is that HRM practices lead to high levels of performance on condition that they are aligned with a company's strategic goals and its internal and external environment. For instance, MacDuffie (1995) highlights the importance of aligning HRM practices within an underlying logic of work organisation. He employs the term 'flexible production' to describe the process of integrating technology and production with work practices. His hypothesis is that the effectiveness of HRM practices depends on their integration within the general work organisation. His study finds that bundles of internally consistent HR practices improve productivity and quality (e.g. levels of production defects are lower). However, in order to enable the conduct of contingency research, data needs to be purposeful collected and such data is presently scant.

In the end, several studies have set out to test this 'bundling hypothesis', a term coined by Leigh and Gill (1999). For instance, Pfeffer (1994), Milgrom and Roberts (1995), Wood (1995), Ichniowski *et al* (1996), Jalette (1997) or Wood and de Menezes (1998) show that groups of HRM practices have more impact on organisational performance than individual HRM practices. Pfeffer (1994 : 27) notes that 'interrelated practices' are characteristic for effective companies, and that the key to their success is in people management. Wood (1995 : 52) mentions that the 'combined effects of such practices [high commitment practices]' can allow managers to elicit high levels of commitment

In particular, Ichniowski *et al* (1996) conclude that individual workplace practices have no effect on performance, but that 'innovative workplace practices can increase performance, primarily through the use of systems of related practices that

enhance worker participation, make work design less rigid and decentralise managerial tasks' (Ichniowski *et al* 1996 : 299). The system of 'coherent and integrated practices' mentioned includes: extensive recruiting, careful selection, flexible job definitions, problem solving teams, gain-sharing compensation plans, employment security and extensive labour-management communication.

Appealing evidence is also offered by Huselid (1995) who finds in his cross-industry study that annual sales per employee in industries with 'best' practices are \$100,000 higher than in industries with 'worst' practices. Marchington and Wilkinson (2000) warn that businesses should not adopt a piece-meal integration approach to HRM practices, and that the best way is to go for an integrated approach, based on HR managers ability to identify and implement HRM systems centred around 'bundles' of practices. If data were collected on HR managers' perception of the HRM systems which work best in their workplaces, it would indeed be interesting to see what information could be gathered from this integrated approach to research.

However, there is controversy over the terminology and the methodology employed in this line of research, too. HRM practices are analysed in 'consistent wholes' by Kling (1995), in 'bundles' by Black and Lynch (2001), in 'clusters' by Ichniowski *et al* (1997), or tested as a 'bundling hypothesis' in Leigh and Gill (1999). With regard to methodological issues, practices are sometimes simply lumped together according to researchers' ad hoc indicators and analysis, or methods such as confirmatory Factor Analysis are used (e.g. Kelley 1996). Ichniowski *et al* (1996) caution that these methods assume that HR practices are substitutes, and fail to take into account their complementarity. Nevertheless, Ichniowski *et al* (1997) and Becker

and Huselid (1998) offer examples of studies underlining complementarity. An alternative methodological option is cluster analysis (e.g. Arthur 1994). Another suggestion is using multiple methods to test if they point to the same clusters and to similar performance influences (e.g. Ichniowski *et al* 1997).

There is also a clear disagreement over the number of practices in the bundling hypothesis. Wood and de Menezes (1998) show that the approach to practices included in bundles varies substantially. Indeed, Huselid (1995) finds 13 HRM practices, Delery and Doty (1996) provide 7, Wood (1999) provides 17 practices. Even in the case of a single author, the range varies: Pfeffer identifies a list of 16 practices in his 1994 study, 13 practices in 1995, and then 7 systems of HRM practices in 1998.⁵

Hence, it could be particularly useful to collect data which also ask managers whether they have intentionally implemented a particular practice in conjunction with another practice. This would help in the research of a notable hypothesis in HRM practices, namely the bundling hypothesis. This is the belief that companies benefit from synergetic effects when combining HRM practices.

As a consequence of the inconsistencies exposed above, there is no consensus in the empirical literature over which groups of HRM practices determine or affect company and employee performance. Loundes (2000) pessimistically concludes that no single set of HRM policies applies across workplaces to affect all measures of

⁵ For a quick reference to the well-known work of Pfeffer (1998) see Appendix A.6 which lists the seven practices. Also, Appendix A.7 highlights the critical importance of HRM practices to organisational performance by presenting a downward performance spiral (following the arrows in a continuous movement) which can occur with decreases in performance and inadequate responses from the individual employees or organisational practices.

performance in the same way. This highlights clearly the need for more research into the subject.

2.3. Researching the HRM-performance relationship: enduring questions

In order to present an even more refined review of the empirical literature, this section comprises a succinct summary of core research findings in response to four questions that remain on the top of research agendas. In spite of the high interest that these questions raise, answers are yet unclear. These four questions are: (1) what are the differences between the 'old' and the 'new' practices?; (2) what is the incidence of HRM practices?; (3) what triggers the adoption or rejection of HRM practices?; and (4) how do HRM practices impact on company / employee performance?

2.3.1. What are the differences between the 'old' and the 'new' practices?

There is a blurred barrier between the 'old' or 'traditional', and the 'new' or 'innovative' HRM practices. As mentioned in section 2.2 of this chapter, there is a wide variety of terms used with apparent definitional laxity and interchangeably to refer to 'new' or 'innovative' HRM practices. Ad-hoc measures seem to be used in order to designate an HRM practice as 'innovative' or a workplace as 'transformed'. For instance, Osterman (1993 : 14) estimates that 37 percent of his sample of American firms can be characterised as 'transformed', i.e. firms where fifty percent or more of the workers are involved in any two of the following four practices: self-directed teams, job rotation, quality circles, or total quality management.

Previous sections in this chapter aimed to identify attempts at creating a taxonomy for HRM practices whereby the criterion for classification was the opposition between 'old' and 'new' (Parks 1995 in Appendix A.2; Ichniowski *et al* 1997 in Appendix A.5) but no particular attention has been paid in either study to understanding which or to what extent 'old' HRM practices have been transformed or replaced by their 'new' counterparts. This ambiguity leaves space for legitimate doubts regarding the 'newness' of some HRM practices such as training, a practice which has been around for more than a century.

Nevertheless, other authors signal the presence of a 'new vision' in some companies (Appelbaum and Batt 1994 : 4) or of a 'metamorphosis in discourse and practice', which is not only based on the change in titles from industrial relations to employee relations, then to employment relations and a range of other terms (Cully *et al* 1999 : 246). In addition to this title change, Cully *et al* (1999) focus on the WIRS series in Britain in order to present a picture of a continuous fall in the 'traditional' system of British industrial relations (Cully *et al* 1999 : 293).

This traditional system is claimed to have firmly covered the time span from the World War II and up to the late 1980s (Fox 1985). The emphasis was on bureaucratic forms of control and tight supervision at work. Or, as shown by Frey (1993), the benefits of tight supervision 'crowded out' effort at work, creating a dispute between trust in the employees and their loyalty. The shift in managerial practice was towards practices that would motivate the employee to participate in organisational activities, 'join' the corporate culture, act according to the corporate vision. Generally, these practices have moved the management agenda from personnel relations to human

resource management. The move is widely known to be accompanied by the demise of the previous industrial relations framework and of unions. A comprehensive and up-to-date picture of this move to HRM practices is presented in Blanchflower *et al* (2006).

One important factor in this change appears to be via employees being enabled (or coerced? - this is still a contentious issue in the literature) to identify their interest with that of the organisations, and Osterman (1994) describes this change as 'an alternative control mechanism'. Lamenting what he perceives as explanatory limits of the agency theory when it comes to analysing forms of control in the workplace, Osterman (1994) documents that workplace practices have 'transformed' employees' willingness to engage voluntarily in 'forms of behaviour which would be extremely difficult to induce via better monitoring' (p. 380). Changes in the political, legal and social context are mainly summarised in the Conservative government programme emphasising individualism and an entrepreneurial culture (Cully *et al* 1999). At the same time, the power of employers has increased at the expense of employees, a trend slightly countered by European legislation (*ibid.*).⁶

The behaviour in organisation literature documents these changes while describing their nature as invasive to the individual through the systems of control implemented in workplaces. For instance, in the mid eighties, culture as control was compared to a totalitarian system because it 'can ensnare workers in a hegemonic system' (Ray 1986). Subsequently, corporate behaviour, through systems of control, has led many critics to compare it to 'an invasive tyranny' (Kunda 1992 : 20). As opposed to rational control – which emphasised quantifiable targets, rigidity and

⁶ For instance, a piece of European legislation limiting the amount of working hours has not been enforced in UK. Instead, some employers include an opt-out clause in working contracts, enabling them to demand longer working hours.

formality - the changes were towards managers applying normative control whereby: 'managers could more effectively motivate workers by attending not only to their behaviour but to their thoughts and emotions' (Barley and Kunda 1992). Consequently, employers and employees have devised mechanisms to escape the tension of control usually manifested as stress in the workplace.⁷

Management practices reflected this change by focusing on more individual-centred practices and accentuating the importance of strategy. These practices were labelled 'human resource management' (Guest 1987) and the change was fuelled by pressures from the labour market in the form of global increased competition and privatisation of national industries (e.g. in Britain, through the deregulation of sectors such as financial services and transportation, the reduction in manufacturing and increase in the services sector).

Furthermore, the British economy went through two full business cycles during the period covered by one of the most representative series of surveys for Britain, namely the WIRS series (WIRS1980, 1984 and 1990, WERS 1998, and a WERS5 survey is available in 2004) (Cully *et al* 1999). Some HRM practices emerging against this backdrop include employee involvement, appraisal systems and performance-related pay.

⁷ One such mechanism is humour: 'the tension that people feel as a result of the lack of control over their lives, created by employment insecurity was lessened by the act of laughing together with others who were similarly stressed' (Watson 1994 : 188). Nevertheless, the workplace can interfere destructively with the personal lives of the employees. Hochschild's study (1983) of 'subjectivity as control devices' documents the experience of flight attendants who have forgotten how to smile other than professionally. Sennett (1998) talks about corrosion of character in a society where 'flexible capitalism' puts the individual under unprecedented tension in the workplace.

The main changes in the management of employees in Britain as reflected by the WIRS series are presented in Appendix A.8. From a conclusive point of view, Cully *et al* (1999) remark that the general picture offered by WERS 98 is that of management trying to retain control and to contain costs. (Cully *et al* 1999 : 295). Employee control is achieved mainly through direct supervision, followed by making employees responsible for the quality of their work. Many workplaces choose to take a low-wage path and pursue numerical flexibility. Most workplaces monitor financial aspects by setting targets and have little authority devolved downwards to line managers or employees. A more in depth discussion of further changes in HRM practices is presented by Blanchflower *et al* (2006) who focus on the WIRS series in Britain.

In reply to this question, the present thesis attempts to implement a categorisation of HRM practices, as well as to understand the following: which HRM practices lead to job satisfaction (Chapter III)?; which HRM practices increase employee effort and stress (Chapter IV)?; and what is the relationship between the implementation of two high-impact HRM practices, training and promotion (Chapter V)?

2.3.2. What is the incidence of HRM practices?

Potentially due to the disparities in definition, measurement and questionnaire design, there is contradictory evidence relating to the incidence of HRM practices. Ichniowski and Shaw (2003) report on US companies having ‘dramatically’ increased the use of ‘innovative’ HRM practices in the past 20 years, yet Appelbaum and Batt (1994) remark that few companies implement new HRM practices due to the potential obstacles to the diffusion of rapid change (such as employers being wary of high transformation costs which could lead to short-term losses in profitability).

This thesis mainly uses the WIRS series in Britain. Evidence coming from the WERS 98 dataset regarding the incidence of a pre-selected set of 15 ‘high commitment management practices’ is summarised in Table 2.1:

Table 2.1: Incidence of management practices, by presence of personnel specialist and integrated employee development plan

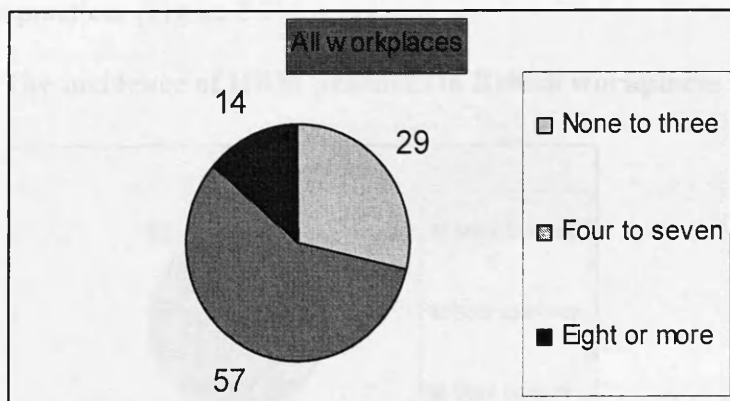
	Personnel specialist & integrated employee development plan	Personnel specialist only	No personnel specialist or integrated employee development plan	All workplaces
<i>% of workplaces (rank is given in brackets)</i>				
<i>Largest occupational group has :</i>				
Temporary agency workers	19 (13)	18 (10)	14 (9)	18 (10)
Employees on fixed-term contracts	38 (9)	32 (8)	12 (10)	28 (9)
Personality tests	17 (14)	10 (15)	5 (13)	11 (14)
Performance tests	42 (8)	34 (6)	17 (7)	35 (7)
Formal off-the-job training for most employees	51 (6)	30 (9)	18 (4)	36 (6)
Profit-related pay	24 (10)	14 (12)	5 (13)	15 (11)
Employee share ownership scheme	12 (15)	10 (15)	1 (15)	6 (15)
Regular performance appraisals	69 (2)	61 (2)	31 (3)	58 (3)
Fully-autonomous or semi-autonomous teams	44 (7)	33 (7)	14 (9)	34 (8)
Single status for managers and other employees	51 (6)	42 (5)	22 (6)	40 (5)
Guaranteed job security	20 (12)	14 (12)	1 (15)	13 (13)
<i>Workplace has:</i>				
Formal disciplinary and grievance procedures	97 (1)	95 (1)	64 (1)	88 (1)
Group-based team briefings with feedback	65 (3)	52 (2)	48 (2)	59 (2)
Most non-managerial employees participate in problem-solving groups	20 (12)	11 (13)	6 (11)	15 (12)
Two or more family friendly practices or special leave schemes	59 (4)	45 (4)	15 (5)	41 (4)

Source: Adapted from Cully et al 1999

The spread of these practices is analysed by focusing, where possible, on the core workforce group (that is the largest occupational group) ‘as this is the best test of how deeply practices were embedded in the workplace’ (Cully *et al* 1999 : 80). The factors influencing the spread of management practices as identified in WERS 98 are:

(1) employment size (of the workplace and organization); (2) industry sector; (3) the structure of personnel management function (presence of personnel specialist, defined in Cully *et al* 1999 : 49 as the person “primarily responsible” for employee matters at the workplace); and (4) unionisation (Cully *et al* 1999 : 80). Practices were more widespread in: (1) large workplaces; workplaces (of all sizes) that were part of larger organisations; (2) in the public sector; (3) where there was a personnel specialist either at the workplace or at a higher level in the organisation and where there was a strategic approach to employee relations - i.e. ‘evidence of a strategic plan encompassing employee development which has been drawn up with the aid of an employee relations manager, and Investors in People accreditation’ (see Table 2.1 for evidence of the large impact on incidence of these factors when jointly present); and (4) where unions were present (Cully *et al* 1999 : 80). Nevertheless, the incidence of the 15 high commitment management practices identified by WERS 98 remains limited: 86% of all workplaces covered in the survey have only implemented seven or less of these practices, as shown in Figure 2.1.

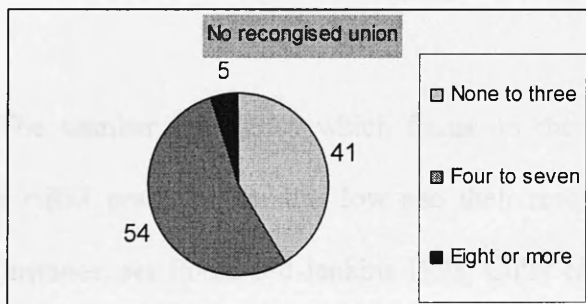
Figure 2.1. The incidence of HRM practices in British workplaces (WERS 98)



Source: Adapted from Cully *et al* 1999

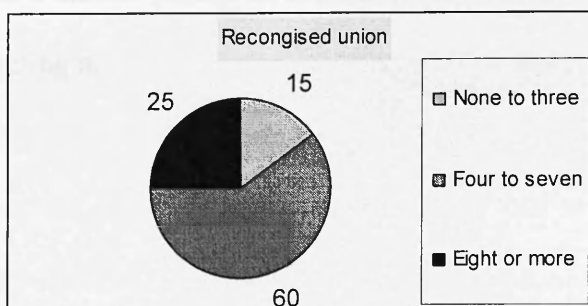
The corresponding figure for workplaces with no recognised union is even higher (95%) (Figure 2.2). Union recognition is positively associated with the incidence of high commitment practices, but union recognition has been falling in the UK. Even if around 57% of workplaces implement four to seven practices in both unionised and non-unionised companies, companies without union recognition tend to be eight times more likely to implement less than three high commitment practices (41% compared to 5%), and only one in six companies implementing more than seven practices is without union recognition.

Figure 2.2. The incidence of HRM practices in non-unionised British workplaces (WERS 98)



The highest incidence of practices is in workplaces with a recognised union, but still only one in four companies (25%) have implemented eight or more high commitment practices (Figure 2.3).

Figure 2.3. The incidence of HRM practices in British workplaces (WERS 98)



The HRM practices most widespread (in almost more than one in three firms) according to WERS 98 are: (1) procedures for dispute resolution 88%; (2) briefing meetings 59 %; (3) regular performance appraisals 58 %; (4) family friendly working arrangements 41 %; (5) single status 40 %; (6) formal off the job training for most employees 36 %; (7) performance tests 35 %; (8) fully-autonomous or semi-autonomous teams 34 %; and (9) employees on fixed term contracts 28 %.⁸ Other HRM practices have an incidence lower than in one in five firms: (1) temporary agency contracts 18 %; (2) profit-related pay 15 %; (3) most non-managerial employees participate in problem solving 15 %; (4) guaranteed job security 13 %; (5) personality tests at recruitment 11%; and (6) employee share ownership schemes 6%.

The number of studies which focus on the factors that impact on the incidence of HRM practices remains low and their results do not convey a unified picture (for instance, see Poole and Jenkins 1998; Cully *et al* 1999; Guest *et al* 2000a; and Ichniowski and Shaw 2003).

While the WERS 98 data presents a very good starting point for analysis, more data needs to be collected, ideally with a higher time frequency (e.g. annually), in order to gain a clearer picture of the incidence of HRM practices in Britain and the changes affecting it.

⁸ It can be noted that this set of practices has not been strictly chosen due their novelty factor.

2.3.3. What triggers the adoption or rejection of HRM practices?

There is a definite need for further research in order to uncover the factors that trigger the decision to adopt or reject certain HRM practices. The research into this question is complex, as its investigation relies on more answers to the previous question, namely on research on the incidence of HRM practices, as well as on answers common to many other questions, such as investigating what triggers change. As such, Appelbaum and Batt (1994) document that the desire of American workers to participate in organisational change came from: the decline in real wages, high unemployment and a desire for more fulfilling jobs (Appelbaum and Batt 1994 : 4).

Studies which address the reasons behind the decision to adopt or reject HRM practices are not numerous. Rather than investigate these reasons in depth, advice is prescriptive and limited to encouraging firms to follow in the steps of 'successful' firms.

The fact that set-up costs for implementing HRM practices can be prohibitive is mentioned as a drawback for adopting 'new' practices by Cully *et al* (1999). If the successful implementation of an HRM practice is contingent upon the presence of related HRM practices or upon a set of firm/employee characteristics, the HRM practice may not lead to the expected results, and if these practices fail when first implemented, managers may wrongly assume that they do not work and conclude against their adoption. Similarly, Heywood, Siebert and Wei (1997) mention that payment by results has higher set-up costs than time rates, and these costs may consequently be prohibitive.

A second reason for rejecting the implementation of an HRM practice is the existence of first-mover effects. Addison and Belfield (2001) argue that there may be first-mover effects whereby establishments which are early adopters of a practice experience immediate gains not available to late adopters - e.g. changes in the relationship between workplace governance and performance. Some companies may have adopted new strategies and cultures that render employee involvement schemes irrelevant. Moreover, Black and Lynch (2001) find that the association between HRM practices and increased productivity depends less on whether a particular practice is adopted, and more on *how* that practice is implemented.

A third factor influencing the decision of adopting or rejecting an HRM practice is ownership change. For instance, Millward *et al* (2000) find that the most common reasons for introducing, as well as for withdrawing, a profit-related pay scheme in companies covered by WERS 98 'was that the workplace had undergone a change of ownership or control'. This reason was mentioned by a quarter of workplaces which introduced this practice, and a third of places which withdrew it.

A fourth factor is the presence of incentives to support the adoption, or to encourage companies not to adopt a certain HRM practice. Not enough policy back-up (such as tax reductions) could constitute an explanation for the low incidence of some HRM practices in the UK (Millward *et al* 2000). However, government policy is the main source of change 'in only a few specific matters' (Millward 2000 *et al* : 233). It is found that especially in the private sector change may be triggered by two kinds of factors: compositional change (e.g. change within the organisation) and change within

continuing workplaces (wider patterns of change across organisations) (Millward *et al* 2000: 233 - 234).

In the end, some authors maintain that firms may not necessarily follow a strict and long-lasting rationale, but rather implement HRM practices in an ad hoc manner, following fashions or advice from management gurus or consultancies. Moreover, there could be an intentional reason behind following this hypothesised approach to decision making: if HRM practices tend to be emergent and implemented initially without written descriptions, responsibilities for these practices among managers remain unclear while the practices have not yet been fully tested in the company, and managers' direct responsibility in the case of failure could be avoided (Tyson 1995). At the same time, an ad hoc style of adoption or rejection presents the advantage that HRM practices are more easily subjected to rapid change when companies have to adapt to market competitive pressures.

In Britain, Cully *et al* (1999) make this hypothesis seem even less far-fetched, as 'it is reasonable to conclude for most workplaces that the broad approach to management is still one of control with high commitment management practices adopted on an ad hoc basis' (Cully *et al* 1999 : 295). They also remark: 'a conundrum remains: why ... are such practices [high commitment practices] not more widespread?' (Cully *et al* 1999: 295). In a similar way to the previous research question highlighted in this section, there is need for more data to be collected in order to enable further research in this direction.

2.3.4. How do HRM practices impact on company performance?

The main assertion of empirical studies, which are often exclusively non-theoretical, is that HRM practices can ‘transform’ organisations into being cost-efficient and productive, and increase employee well-being. For instance, Pfeffer (1998) reports that, in most of the studies he reviewed, substantial gains of around 40 percent were the result of implementing what he refers to as ‘high performance management practices’. On a similar note, Huselid (1995) uses nationally representative data on nearly 1,000 American firms with more than 100 employees and finds that a one-percent standard deviation increase in ‘high-performance work practices’ translates into a seven-percent decrease in labour force turnover, and on a per-employee basis, into: sales increases of \$27,000, market value increases of \$19,000, and profit increases of \$4,000.

Yet, there is no obvious answer to this question. Choosing ‘the best’ HRM practices, that is those which improve performance the most, remains a puzzling problem for both practitioners and researchers (Ichniowski and Shaw 2003). There are vast possibilities of combining in-house and imported practices (Appelbaum and Batt 1994) and this makes the analysis of their impact on performance complex. Moreover, in spite of increasing research and debate in the area, managers still doubt the added-value that these ‘innovative’ practices bring to their businesses (Ichniowski and Shaw 2003). Not only do studies focus on diverging HRM practises, but also the evidence of the impact that practices have on performance varies.

A few of the most commonly investigated types of HRM practices are selected below and their impact on company and employee performance is analysed separately. The four types of HRM practices highlighted in relation to their impact on company performance are: (1) financial incentives (e.g. profit-related pay); (2) labour-management communication; (3) training; and (4) high-commitment practices. Out of these, three practices are also highlighted in relation to employee performance: (1) financial incentives, (2) high-commitment employee involvement and teamwork, and (3) unionisation.

2.3.4.1. Effects on company performance

Profit related pay figures prominently among the most pondered upon HRM practices that can determine company performance. Several firm-level studies from the UK, the US, Germany and Australia support the hypothesis of a positive association between profit related pay and labour productivity (Blanchflower and Oswald 1988, Kruse 1992, Loundes 2000, Addison and Belfield 2001, Black and Lynch 2001). However, Black and Lynch (2004) report that the link between higher company productivity and profit sharing and/or stock option is found not to be consistently statistically significant. According to Prendergast (1999), when and where incentive pay is used, researchers encounter selection and identification problems, and this subfield of research is generally restricted to companies where output is easily measurable. Moreover, forms of pay that tie compensation to profit tend to be perceived as risky.

Additionally, financial incentives and management-labour communication can influence company performance, but in different ways. Hirschman (1970) defines 'voice' as attempts by employees to change their organisational circumstances rather than leave. Voice can be exercised individually or collectively, and it can be addressed to the management or authorities beyond the organisation. Seminal work by Freeman and Medoff (1984) on the exit-voice theory of trade unions has shown that unionised workplaces have a lower labour turnover rate since unions act as a voice mechanism through which employees negotiate or express their concerns rather than exiting. Jalette (1997) finds that 'mobilization' and 'voice' groups of HRM practices are significantly associated with increases in productivity and profitability. However, the 'voice' set is also significantly associated with increased production costs, which implies that sharing control and power with employees is a trade-off and should have its limits.⁹

Labour-management communication features highly as part of one of the oldest success stories of companies – especially in the manufacturing sector - which were turned around by a skilled selection and implementation of HRM practices. Parker and Slaughter (1988) report on what is one of the most highly researched case studies during the 1980s on the impact of HRM on company performance. The New United Motors Manufacturing Industries (NUMMI) plant was taken over from General Motors by Toyota and in two years transformed into a highly performing plant, with 85

⁹ New research into voice shows that this communication mechanism has still more aspects to reveal. In a Canadian case-study, Luchak (2003) finds that the type of 'voice' used by employees is mediated by their feelings of loyalty to the company. The more the employees are loyal, the more likely it is that they use direct channels of communication rather than traditional 'voice' representation via trade unions. Luchak's (2003) study offers mixed support to the Hirschman (1970) exit-voice-loyalty framework, whereby more loyal employees voice their concerns instead of exiting the company and if ultimately they leave the organisation, they do so from a stronger position.

percent of the labour force remaining employed. Training, teamwork and labour-management communication figure among the main practices implemented.

Training, though controversially presented as an innovative practice, appears both positively and negatively related to performance. American research conducted by Black and Lynch (2001) finds a clear relationship between increases in company productivity and employing skilled non-managerial workers, especially when skill is measured in the form of education and computer usage. Parker and Slaughter (1988) also found a positive relationship between training and company performance.

In contrast with these results, Jalette (1997) analyses Canadian financial institutions and finds that human resource development practices (training, succession planning, performance appraisal and information meetings) have diminished profits in the short term due to high upfront training costs. The author suggests that institutions wait to see the long term effects of training (i.e. the higher likelihood that training benefits are visible in the company in the long run), but cautions against the risks of higher labour turnover (e.g. the best workers may leave the company after training). The study finds that training costs are only marginally compensated by the enhanced productivity associated with the introduction of “voice” practices; the overall effect on profitability is positive but not significant.

Inconsistent results with regard to the impact of training on performance may derive from the fact that analysing training raises the issue of imperfect markets whereby increases in wages are at best lagging behind increases in productivity due to training (as analysed in Acemoglu and Pischke 1998). Another pervasive issue is the

need to control for unobserved heterogeneity and endogeneity of training (e.g. Bartel 1994 and Black and Lynch 1998 fail to do so).

A set of HRM practices particularly high on the agenda of empirical research are practices perceived to increase employee's commitment to their jobs and organisational goals. Arthur (1994) uses cluster analysis to isolate six systems of HRM practices, which are then grouped in two broad categories: 'cost reducers' (with emphasis on workforce control, reduction in labour costs and increases in efficiency) and 'commitment maximisers' (with emphasis on increasing employee commitment). His results suggest that 'commitment' HRM practices lead to lower labour turnover and scrap rates and higher productivity than the 'control' HRM practices. Further, Ichniowski *et al* (1997) find that 'cooperative and innovative' practices have a significant impact on productivity. These HRM practices include teamwork, incentive pay, job security, flexible job assignments, training and communication. However, Knight and Latreille (2000) use WERS 1998 and find that high-commitment workplace practices do not have a significant impact on rates of disciplinary sanctions, dismissals and the incidence of unfair dismissal complaints.

Since employee involvement (EI) is usually seen in relation to high-commitment practices, it follows that studies mentioning EI are relevant to analysing these practices. Like most HRM practices, EI is loosely defined as a combination of forms of communication and effort to boost communication (such as introduction of EI initiatives in recent years), amongst which are: regular meetings of the entire workforce, systematic use of the management chain, suggestion schemes, surveys, quality circles (for example, see Addison and Belfield 2001). Black and Lynch (2001)

find that Total Quality Management has an insignificant, or even a negative, impact on productivity unless a high proportion of employees are involved in regular decision making. Also, Black and Lynch (2004) support the positive influence of high-commitment practices on company performance, amongst which is employee participation in meetings. They analyse US data from 1993-1996 (Workforce National Employers Survey, in the manufacturing sector) and consider that increases in company productivity come from four main practices: quality management, incentive-based compensation, employee involvement (especially employee voice) and continuous innovation.

In comparison to the studies on company performance summarised above, the remaining part of this literature review deliberately brings together a relatively higher number of studies on employee performance. Recent interest in isolating the determinants and effects of HRM practices on employee performance (e.g. Guest *et al* 2000a) may be fuelled by the relative lack in the economic empirical literature of studies on employee performance, in comparison to studies on company performance. Thus, there is a need in the literature for attempts at redressing this balance by presenting a two-sided perspective of HRM practices from both employees' and managers' points of view.

2.3.4.2. Effects on employee performance

Three sets of HRM practices are highlighted in relation to employee performance: (1) financial incentives; (2) high-commitment employee involvement and teamwork, and (3) unionisation.

There is some consistency in research towards the view that financial incentives have a positive influence on employee performance. Kruse (1992) reports that profit sharing leads to a boost in worker effort and skills. Fernie *et al* (1994) use WIRS3 (1990) to report on how HRM practices can be used to increase the likelihood of good relationships in the workplace and improve economic performance. Three measures of economic outcomes are employed: (1) productivity compared with similar workplaces; (2) productivity changes in the previous three years; and (3) change in employment (e.g. labour turnover) in the previous six years. Besides these three economic outcome measures, three industrial relations measures are also employed: industrial climate ratings, the quit rate, and absenteeism rate. A benchmark for workplaces is defined, including: (1) average workplace; (2) strong union; (3) strong HRM; and (4) non-union non-HRM. Results suggest that profit-sharing, employee share ownership plans, merit pay and other employee involvement techniques boost both workplace productivity measures.

However, Addison and Belfield (2001) rework the data used by Fernie and Metcalf (1995) and report different results especially on the effects of employee involvement. Using the WIRS 1990 Fernie and Metcalf (1995) report that unions have a negative impact on workplace economic outcomes (except on quit rates), and that employee involvement improves economic outcomes but not so much the industrial relations outcomes. However, in their attempt of replicating Fernie and Metcalf (1995) as closely as possible albeit using the WERS 1998, Addison and Belfield (2001) do not find a negative union effect, a result change which could be attributed to the intervening decline in unions. Additionally, they find no consistency in the impact of employee involvement on financial performance, possibly due to first-mover effects in

the market or to new cultures that obviate the need for formalising employee involvement.

Financial incentives also work well alongside employee involvement. Fernie and Metcalf (1995) use WIRS3 (1990) and find that employee involvement and contingent pay are more likely associated with economic outcomes than with industrial relations outcomes. Economic outcome measures are productivity levels and changes in employment. However the authors caution that ‘most of the channels to potentially better outcomes read more like a wish list than a coherent theory of why performance might improve’ (Fernie and Metcalf 1995 : 383).

The impact of employee involvement and high-commitment practices on employee performance is debatable. Freeman *et al* (2000) use information collected from both companies and employees and find that employee involvement has ‘weak and poorly specified’ effects on employee output. However, it is also found that employee involvement has a strong and positive impact on employee well-being. Concerning the latter result, further research could consider employee expectations with regard to these variables (e.g. by using a variant of expectancy theory as outlined by Guest *et al* 2000a). On a similar line of finding positive effects, Guest *et al* (2000a) report on two large-scale cross-sectional empirical studies conducted in Britain. They suggest that employees respond positively to high-commitment practices by experiencing not only more commitment to their jobs and higher satisfaction, but also, as shown by Guest (1999) ‘feelings of fairness, trust and other elements associated with a positive psychological contract’ (Guest *et al* 2000a : 9). Additionally, Jallette (1997) finds that a poor HRM and industrial relations climate, usually identified by

low workplace morale and low commitment, is significantly associated with decreases in productivity and increases in production costs.

A positive influence of employee involvement, alongside other HRM practices, is also signalled by Gittleman *et al* (1998). They use the BLS 1993 Survey of Employer Provided Training to analyse determinants of worker flexibility. They ask establishments to report on the existence of six practices: (1) teamwork; (2) total quality management; (3) quality circles; (4) peer review of employee performance; (5) employee involvement, and (6) job rotations. Findings suggest that self-managed teams, employee involvement in technology and equipment purchase decisions, and job rotation may be used to increase worker responsibility and flexibility. Unfortunately, this study does not use more specific measures of employee performance.

The main implication for further research is that employee concerns, attitudes and behaviour should play a larger part as explanatory variables in performance studies. Incorporating into the analysis the role of employee expectations and aspirations could prove to be a fruitful research path.

With regard to unions, in general, a vast number of studies find a positive association between the existence of unions and employee performance. An intriguing study comparing the influence of HRM (individualisation) to unions (collectivism) concludes that HRM brings little contribution to the industrial relations climate, as management-employee relationships are worse in 'strong HRM' than in 'strong union' workplaces, and quit rates are higher (Fernie *et al* 1994). Loundes (2000) examines the

1995 Australian WIRS and finds that a unionised workplace may have positive effects on employee performance outcomes by lowering quit rates, apparently due to the voice effects of allowing employees to express their opinions.

This thesis attempts to contribute to answering the research question of how and which HRM practices impact on company and employee performance.

2.4. Conclusions and summary

Stemming from the market-driven attractiveness of the HRM-performance relationship, virtually countless empirical studies in both the economics and HRM literatures have tried to scrutinise and map this research topic in the past two decades. In popular management books, ‘high-commitment HRM’ is touted as the answer to virtually every organisational problem, and mentioned as an essential ingredient in numerous company success stories. Conversely, research cautions against the view that high performance HRM practices are a panacea, and does so as academics themselves are puzzled by this research topic.

Various theoretical and empirical attempts to untangle this relationship were presented in this literature review. However, no study presumes to have rigorously identified a taxonomy for the measurement of either HRM practices or company / employee performance. This gives the field of research on the HRM-performance relationship its unsystematic trait and constitutes the main challenge of research on the topic.

A core of HRM practices with predictable impact on performance is yet to be found. However, the limits of the HRM normative framework do not encourage research on this line. The main reason may be that these HRM practices are contingent on company, industry or state of the economy, hence the attempt to contend that certain HRM practices are universally enhancing performance would be rationally flawed. Additionally, Black and Lynch (2001) caution that in order to increase performance, the search for better HRM practices is given too much attention in empirical studies, to the detriment of the more important issue of *how* HRM practices should be implemented. However, there is yet no consensus in either the economic or HRM literatures over which or how HRM practices impact on company and employee performance.

There is a need for more interdisciplinary research in order to study both the employees and the company with the appropriate set of concepts. The study of the individual in psychology and sociology could be extended to the study of the employee, while company performance has traditionally been embraced by management or economics. In order to understand the mechanisms through which HRM relates to performance, an interdisciplinary route has been often advised (for example, Becker and Gerhart 1996, Baron and Kreps 1999). To resort to the economics field with the aim of studying company and employee performance, may seem one of the first and most appropriate research decisions. In addition to economics, attention could also be paid to akin lines of research in social sciences, even though they are built on divergent premises: sociology, psychology, organisational behaviour. More specifically, it has been signalled that the interdisciplinary research framework offering

the best insight into economic performance should be integrating economics with organisational behaviour (e.g. Tomer 2000).

Content manageability and time constraints mean that the focus of the thesis is narrowed to using mainly two disciplines: economics (in particular, labour economics) and organisational behaviour (in particular, HRM practices). A further disclaimer is that, due to the large complexity of concepts related to workplace practices, a selection had to be made in order to narrow the scope of this research and to increase its efficiency. Hence, this thesis will not discuss issues related to labour regulation, law and legislative matters included in HRM practices, nor will it speculate upon their impact on company and employee performance.

This thesis aims to place itself at an interdisciplinary meeting point by emphasising complementarities between economics and other social sciences, particularly HRM, with the intention to enhance the understanding of the link between HRM practices and the performance of the employee or company. Thus, this literature review chapter continues with a section highlighting the main findings in the empirical economic and HRM literature on the HRM-performance relationship.

The need for more research is recurrently mentioned in both economics and HRM literature. For instance Kling (1995) insists that ‘studies must be supplemented by cross-industry research to assess different sectors in a comparative framework’ (ibid. 35). It is indeed surprising to find that despite the large interest in HRM practices and the fact that the majority of HRM practices may at some point be labelled ‘high

performance', there is scant evidence for their actual effect, for the size of the effect, and for their interaction – hence the choice of research topic in this thesis.

Notably, more data is needed to understand the mechanisms which determine managers to choose which practices to implement, and the relationship between degrees of implementation and performance. In particular, longitudinal studies are needed.

Despite a vast literature on the HRM-performance relationship, there is yet no clear answer as to what are the differences between old and new practices, what the innovative HRM practices are, or how HRM impact on performance. This is mainly due to the methodological challenges and inconsistencies highlighted earlier in this chapter.

Summary for Chapter II

- Human resource management is a critical business area that can unlock firm competitiveness and improve employee and company performance. From a wider perspective, the right mix of HRM practices can lead to a stronger economy and higher societal well-being.
- The ways in which HRM practices contribute to performance is an area of debate, mainly due to:
 - the inconsistent usage of measures of performance and HRM practices; suggestions from the literature for taxonomies of performance measures, respectively of HRM practices are briefly presented; and
 - the unsystematic nature of extant studies: wide variations in level of analysis; poor data availability; subjective selection of HRM practices researched and of methodology.
- There are enduring questions in the research of the relationship between HRM practices and company / employee performance, such as:
 - what are the differences between the 'old' and the 'new' practices? The differences are blurred, with studies and datasets not having attempted to answer this question. There is controversy over whether 'new' HRM practices have an insidious effect on employees, at the expense of their well-being at work. This thesis attempts to introduce a taxonomy of HRM practices and analyses job satisfaction, company and employee effort, employee stress and the relationship between training and promotion.
 - what is the incidence of HRM practices? With regard to a set of 15 pre-selected high-commitment practices, evidence from the WIRS series, the series mainly used

in this thesis, shows that the incidence is rather limited. More data is needed to enable further research into this area.

- what triggers the adoption or rejection of HRM practices? Factors which influence this decision are summarised, but more data is needed in order to answer this question.

- how do HRM practices impact on company and employee performance? Studies show that certain HRM practices can increase company and employee performance, and most commonly researched types of HRM practices are: financial incentives; labour-management communication; training; and high-commitment practices. However there is no consensus over the set of HRM practices that impacts on performance, the size of their impact on performance, or over what contingency factors lead to higher performance. This thesis attempts to contribute to this area of research in particular.

CHAPTER III

THE IMPACT OF WORKPLACE PRACTICES ON JOB SATISFACTION IN BRITAIN¹⁰

3.1. Introduction

The main objective of this chapter is to present new empirical evidence on the impact of HRM practices on workers overall job satisfaction and their satisfaction with their pay. The original contribution made is that the choice of HRM practices aims to bridge the HRM literature and the economics literature. The chapter investigates the link between specific pay methods and job satisfaction, and between perceived pay dispersion and job satisfaction, both being hereto under-researched areas. A significant contribution is made in the finding that training and learning have significant positive effects on job satisfaction, with the extant literature having paid surprisingly little attention to this relationship. Additionally, union differential effects are tested, and some evidence shows that HRM practices could be performing the same functions for some non-union members as unions do. Lastly, data used is collected on employees, at a scale of around 19,000 observations. Presenting employees' side of the story is a highly valuable feature of this research on employee relations, since extant research is predominantly based on firm level data.

¹⁰ A paper based on this chapter has been accepted for publication as Petrescu and Simmons (2008).

The reasons for researching job satisfaction are multifarious.¹¹ Focusing on the workplace, this chapter asks: is the happy worker also a productive worker? Job satisfaction can be the motivating key to unlocking employee productivity, commitment and loyalty which then translate into higher company performance.

Moreover, the choice of HRM practices implemented in an organisation can have an impact on job satisfaction. When different components of job satisfaction are analysed (e.g. satisfaction with job autonomy, satisfaction with pay), research shows that increases in job satisfaction are associated with the presence of several HRM practices as varied as the increase in pecuniary incentives (Akerlof *et al* 1988), better job design (Batt and Appelbaum 1995), higher employee work “freedom” (Nguyen *et al* 2003), or job variety and prestige (Allen and Velden 2001).

The main original contribution of this chapter is aiming to bridge the HRM and the economics literatures on job satisfaction. Relatively few studies have sought to combine the economics literature with the HRM literature, so aiming to bridge the two while researching job satisfaction is a main source of originality for this chapter. Another important contribution is the insight offered into the relationship between pay methods and job satisfaction, as well as between pay dispersion and job satisfaction. This is a hereto under-researched area, with the exception of some studies on the dispersion of pay and its influence on job satisfaction.

¹¹ As shown by the industrial psychology literature, job satisfaction has wider implications, beyond the workplace (Locke 1976). Job satisfaction impacts on a broad range of phenomena including employee wellbeing, life satisfaction or longevity. For instance, Palmore (1969) finds that satisfied workers live longer and Iris and Barrett (1972) note that job satisfaction is positively related to life satisfaction.

The existent social sciences literature is by default targeting the analysis of attitudinal variables. Additionally, the past two decades have witnessed a burgeoning literature on the economics of job satisfaction, adding to the social sciences literature.¹² There is also a large economics and Human Resource Management (HRM) literature that emphasises the influence of so-called ‘high-performance workplace practices’ on job satisfaction and hence employee performance. Studying the impact of HRM practices on job satisfaction is the main aim of this chapter. Moreover, it also analyses the relationship between unionisation and job satisfaction to see whether this impact is mediated by unionisation.

With regard to the data used, evidence is presented from two nationally representative datasets in Britain. The economics and HRM empirical literature on workplace relations in Britain are primarily based on the Workplace Industrial Relations Survey (WIRS) series, and on a considerably larger number of studies that typically rely on case study analyses.¹³ One dataset used is the 1998 cross-section Workplace Employment Relations Survey (WERS), which offers the advantage of analysing British industries without the limitations imposed by case studies. The other dataset used is the ‘Changing Employment Relationships, Employment Contracts and the Future of Work Survey’ (CERS), conducted in 2000. At the time of this research, the WERS 1998 is the latest wave in the WIRS series, and the CERS is the latest available dataset with information on job satisfaction in Britain. The two datasets are

¹² See, for example Clark (1996), Oswald (1997), Robie *et al* (1998), Blanchflower and Oswald (2000), Clark (2001), Gazioglu and Tansel (2003), Bryson, Cappellari and Lucifora (2003) or Nguyen, Taylor and Bradley (2003).

¹³ Kling (1995), Ichniowski *et al* (1996) and Ichniowski *et al* (1997), Black and Lynch (1997), Leigh and Gill (1999), Appelbaum *et al* (2000), and Delaney and Goddard (2001) are examples for the US, whereas British research includes Heywood *et al* (1997), Poole and Jenkins (1998), Whitfield (2000), Addison *et al* (2000) and Addison *et al* (2001), Delbridge and Whitfield (2001). Case studies have the major drawback of not allowing for generalisations, which is what the current chapter aims to improve.

complements in the analysis carried in this chapter in terms of the representativeness of their data at organisational level (e.g. organisational size).

The remainder of this chapter is broken down as follows. Section 3.2 briefly reviews the theoretical and empirical literature on job satisfaction, then discusses the literature on the impact of HRM practices in relation to job satisfaction. Section 3.3 describes the two datasets used, the hypotheses formulated and the econometric methodology. Section 3.4 discusses the findings from the analysis of the impact of HRM practices on workers' overall satisfaction and that with pay. Then the same section examines the differences in outcome between union and non-union members, followed by a discussion of the impact of pay inequality. Conclusions and the chapter summary follow in section 3.5.

3.2. Job satisfaction and role of HRM practices

3.2.1. The study of job satisfaction - rooted in the social sciences literature

Overall job satisfaction is an attitudinal variable that shows how people feel about the job as a whole and also about a variety of discrete job aspects. In social sciences, where the study of job satisfaction as an attitudinal variable is rooted, it has mainly been analysed from the point of view of intrinsic or extrinsic motivators, situational theory and in case studies in the HRM literature. The focus has generally been on understanding the impact of job satisfaction on a wide range on issues mostly related to individual and societal well-being

One of the earliest definitions in industrial psychology states that job satisfaction is ‘a positive *emotional state* resulting from the appraisal of one’s job’ (Locke 1976 : 1300). Due to its self-reported nature, the study of job satisfaction may be said to have found a more comfortable place on psychologists’ research desk rather than in economics.

Theories of job satisfaction have been developed mainly by psychologists and management scholars. They tend to assign various degrees of importance to sources of satisfaction, which can be classified as either intrinsic or extrinsic. Intrinsic sources depend on the individual characteristics of the person, such as attitudes. Extrinsic sources are situational, and depend on the environment, such as workplace climate. Theories which rely on extrinsic sources are more typically adopted by economists, albeit using different terminology, whereas intrinsic sources are more commonly associated with other social sciences (Luchak, 2003).

Extrinsic theories also have deep roots in the social sciences, and can be traced back, for instance, to Herzberg’s (1959) hygiene-motivation theories, which develop two distinct sets of factors influencing motivation and satisfaction. One set of factors is called ‘motivators’ (i.e., job factors that are work related). These factors are: recognition, achievement, the possibility for growth and advancement, the level of responsibility and the nature of the work itself. Secondly, ‘hygiene’ factors, which are not directly related to the job itself, are also important and relate to the conditions that surround doing that job. These include salary, technical support, company policy and administration, working conditions, status, job security, and interpersonal relationships among supervisors, subordinates and peers. It is very interesting from an economics

point of view to note that this theory suggests pay is not a good motivator - which is a well-established theory in psychological research (see Jenkins *et al* 1998).

A further strand of this theoretical literature is known as situational theory, an example of which is Locke's value-based theory. According to Clark (1996), this is 'a classic reference for the meaning of job satisfaction'. Locke (1976) defines job satisfaction as 'a pleasurable or positive emotional state resulting from the appraisal of one's job or job experiences' (Clark 1996 : 190). Finally, Hackman and Lawler (1971) present an alternative facet-based theory of job satisfaction, whereby job characteristics, such as task variety, autonomy, feedback, identity and task significance influence motivation and job satisfaction.

In the HRM literature, a few sociological and psychological studies have focused on the effects of job satisfaction on firm and employee performance. The majority of these studies are descriptive and often based on case studies (see the reviews in Purcell 1999 and Ramllal 2003), which means that the findings from this research cannot be generalised. For instance, Truss (2001) analyses a single firm (Hewlett Packard), whereas Rigano and Donna (1998) research the experience of one worker.

3.2.2. Job satisfaction as an economics variable related to performance

The business axiomatic assumption that a happy worker is a productive worker has been fuelling interest in decades of research into the job satisfaction-job performance relationship. As the study of job satisfaction ceased to be the prerogative

of social sciences, it became embraced by economists and the focus shifted onto the link between job satisfaction and company performance – with recently added interest into the link between job satisfaction and employee performance. The recent empirical economics literature has made significant developments in the research of job satisfaction. The aim is to identify those HRM practices with an impact on job satisfaction, since the assumption is that these practices would consequently improve employee and company performance. Thus, despite methodological concerns, the study of job satisfaction in Labour Economics has developed under the umbrella of utility functions, whereby personal or job characteristics are entered into a regression equation as control variables, alongside HRM practices.

Traditionally, economists have embraced studies of job satisfaction in the workplace with ‘professional suspicion’ (Freeman, 1978: 135) because it is a subjective variable. Moreover, in methodology, the use of subjective variables on both sides of an estimation equation can be contentious with regard to whether: (a) the studies are theoretic or not; (b) the determinants are objective; and (c) models analyse subjective outcomes which are economically relevant and yield statistically viable results (Hamermesh 2004).¹⁴ Whereas other social sciences have been researching job satisfaction, Blanchflower and Oswald (2000) describe the study of job satisfaction by economists as being ‘still in its infancy’ (Blanchflower and Oswald, 2000 : 8).

An emerging and fast growing empirical labour-economics literature has concentrated in the past decade on analysing job satisfaction. The implicit assumption

¹⁴ Hamermesh (2004) warns against the use of subjective variables on both sides of an equation. Whilst social sciences have used attitudinal subjective variables in their studies, Hamermesh (2004) warns economists against duplication of results obtained by social scientists, against using subjective variables that are not relevant in Economics, and against using incorrect methodology.

is that those HRM practices which contribute to increasing employee overall satisfaction with job, would have a consequent similar positive impact on employee / company performance. At the most basic level, HRM practices would motivate employees by enabling them to work in an environment where they are highly satisfied with their jobs, and so happier employees would then be more productive.

Some of the earliest studies of job satisfaction concentrate on absenteeism and financial turnover. Muchinsky (1977) relates job satisfaction to lower absenteeism. Freeman (1978) relates job satisfaction to lower employee turnover (as in number of employees hired to replace those leaving the organisation).

The recent increasing trend in the economics literature studies the impact of HRM practices on performance by using measures of job satisfaction. The empirical analysis of job satisfaction either implicitly or explicitly draws on the theoretical models discussed above, and in so doing job satisfaction is specified as a function of several individual *and* job characteristics, and interpreted as a utility function (Clark and Oswald 1996; Easterlin, 2001; Nguyen *et al* 2003).

With regard to individual characteristics, research on the determinants of job satisfaction shows that women are more satisfied with their jobs than men, possibly a reflection of their lower expectations from work, which may in turn be a consequence of their relatively poor position in the labour market (Clark 1996, 1997; Groot and Brink, 1999). A U-shaped relationship between age and job satisfaction has also been observed (Sloane and Ward 2001; Blanchflower and Oswald 2001), and married workers are more likely to report a higher level of job satisfaction (Blanchflower and

Oswald 2001). More highly educated workers report lower levels of job satisfaction (Clark and Oswald 1996), possibly because job satisfaction depends on the gap between outcomes and aspirations, and the latter increase with the level of education.

Moreover, HRM practices are entered as independent variables into the utility function equations with job satisfaction. This is because, as it has been shown in Chapter II, recent economic studies investigating the relationship between HRM practices and company and worker performance, suggest that some practices have the potential to ‘transform’ organisations into being cost-efficient and productive, whilst also increasing employee well-being

3.2.3. The role of HRM practices in relation to job satisfaction

There is no pre-defined set of HRM practices analysed in relation to their impact on job satisfaction. Nor are there tendencies for standardisation of models generated. For instance, different components of job satisfaction are analysed (e.g. satisfaction with job autonomy, satisfaction with pay). Research shows that increases in job satisfaction are associated with the presence of several HRM practices as varied as the increase in pecuniary incentives (Akerlof *et al* 1988), better job design (Batt and Appelbaum 1995), higher employee work “freedom” (Nguyen *et al* 2003), or job variety and prestige (Allen and Velden 2001). Additionally, working in teams, greater discretion and autonomy in the workplace and various employee involvement and pay schemes, do motivate workers and hence generate higher labour productivity (Cully *et*

al 1999; Boselie *et al.* 2001).¹⁵ However, overall job satisfaction need not increase if effort is a 'bad' and the rational worker's aim is to maximise the returns from the exerted effort.

Certain researchers remain sceptical about the link between job satisfaction and performance. For instance, in psychological research, Iaffaldano and Muchinsky's (1985) meta-analysis finds only a slight correlation between satisfaction and performance, while Ayman and Chemers (1983) and Butler and Cantrell (1997) conclude that the positive relationship holds under limited circumstances. Fisher (2002) offers a very in-depth and unique insight into the psychological rapport between affect (happiness) and productivity, much of which constitutes a slightly unfamiliar reading to an economist.

Other studies in both economics and psychology confirm the positive relation between job satisfaction and performance or financial turnover. The performance-related outcomes most widely used in the more recent studies of this relationship have usually been quantitative or qualitative measures of output, absenteeism and financial turnover. Agho and Price (1992) refer to employee involvement and organisational commitment, and relate job satisfaction to what is known in the literature as 'situational' variables such as autonomy, routinization and work group cohesion. Autonomy is defined as the degree to which employees have freedom to make job related decisions, and is positively related to job satisfaction. Routinization is the degree to which the employees perform repetitive tasks, and is negatively related to job satisfaction. Work group cohesion is positively related to job

¹⁵ Koch and McGrath (1996) define labour productivity as the 'extent to which human capital is delivering value to the firm' (Koch and McGrath 1996 : 337), mathematically defined by dividing total output by labour input.

satisfaction. Moreover, some economics studies indicate a direct relationship between job satisfaction and reductions in quits, higher financial turnover and higher labour productivity (Freeman 1978, Clark 2001, Shields and Price 2002). Clark (2001) creates a hierarchy of seven job aspects according to the power they have in a quit equation: job security and pay are the most important, followed by the use of initiative, work itself, and hours of work.

The latter study is part of a long-established trend in the literature, namely to segregate overall job satisfaction into additive discrete parts. Breaking down (overall) job satisfaction into facets (e.g. satisfaction with pay, satisfaction with job autonomy etc) is a characteristic of research into the role of HRM practices in relation to job satisfaction. An early example for this tradition is the operationalisation used by Locke (1976). Gazioglu and Tansel (2003) employ four measures of job satisfaction: satisfaction with influence over job, satisfaction with amount of pay, satisfaction with sense of achievement and satisfaction with amount of respect from supervisors. Using maximum likelihood ordered probit analysis their paper updates Clark (1996) and obtains results common to the previous literature, but using a different set of variables. Also, Bessokirnaia and Temnitskii (2001) suggest that the following factors are significant in a study of job satisfaction of industrial workers: work itself, job content, work organization, job stress, length of workweek, amount of work, use of work time, number of holidays, times when shifts begin and end, length of lunch/dinner break, wage levels, mechanization of work, hygienic conditions, relations with management, relations with co-workers, satisfaction of daily needs, medical services, and working conditions in general.

In Britain, in their presentation of evidence regarding British workplaces, Cully *et al* (1999) mention that the goal of the new policy employment relations at present is improving job satisfaction. WERS 98 asked employees whether they were satisfied or dissatisfied on four aspects of their working lives: influence they have over their jobs, pay, sense of achievement obtained from their work and respect gained from managers. The four aspects were compiled to create a summary scale (Cully *et al* 1999 : 181), roughly 50% of employees were found to be satisfied or very satisfied on the summary scale of job satisfaction, 20% were dissatisfied, and 30% were neither satisfied nor dissatisfied.¹⁶ Cully *et al* (1999) conclude that while the main aim of employment policy since mid-1960s, namely to reduce conflict at work, has been achieved – as proved by the decrease in incidence of industrial actions to 94% of workplaces not experiencing any industrial action in the past five years - the new focus should be on job satisfaction (Cully *et al* 1999 : 298). The WERS 98 shows that 93% of workplaces have some workers who are not satisfied with their jobs.

As part of the study of the impact of HRM practices on job satisfaction, this chapter looks at pay methods and their impact on job satisfaction. There is a longstanding interest, especially amongst economists, in the role played by pay and reward structures in determining worker effort and company performance. Reward systems have been analysed predominantly by economists. There are relatively few empirical as opposed to theoretical studies (Pfeffer and Langton, 1993, Lazear 2000). The most notable exceptions (i.e. empirical studies of pay, as opposed to theoretical)

¹⁶ The job satisfaction summary scale is generated by summing the scores for each of the four individual aspects of job satisfaction, summation of which is then scaled back to the original categories (see Cully *et al* 1999 : 191, notes 3 and 4). The purpose of this exercise was “to give a global picture” of job satisfaction via a graphical presentation (Cully *et al* 1999 :181), and herein lie its limitations.

are Black and Lynch (2004), Booth and Frank (1999), Cappelli and Neumark (1999) and Lazear (2000).

While analysing the link between pay-related HRM practices and job satisfaction, studies mostly look at pay-level satisfaction and not at pay methods. Therefore, there is a limited number of empirical economics studies looking at the effects of pay practices on job satisfaction in companies. For instance, Miceli and Mulvey (2000) use two case studies to show that workers satisfied with their pay method are more highly committed to their firm, and that worker satisfaction could originate from satisfaction with pay systems, but not pay levels. Brown and Sessions (2003) find that certain performance-related pay methods are associated with higher job satisfaction, but that some group-sharing schemes may not eliminate free riding and could lead to lower work effort and discourage collaboration.¹⁷

The social sciences observation that pay in itself may not be the best motivator is consistent with some studies in the empirical economics literature on pecuniary incentives. Echoing the results from the social sciences, economics studies show that the link between the level of pay and job satisfaction is not straightforward. For instance, relative pay, fairness and loyalty may play a bigger part in motivating employees and determining the effort they deploy (Brown 2001). Brown *et al* (2004) find some support for the hypothesis that firms may pay higher wages in order to elicit more employee effort; they also note that the linkages between wage premiums work indirectly, via generating higher feelings of commitment and loyalty, and not directly via higher wages. Meanwhile, Bouwens and Lent (2003) also agree with the efficiency

¹⁷ For more studies looking at the impact of specific methods of pay on satisfaction, see Elvira and Town (2001) on favouritism issues raised by individual bonus pay as opposed to piece rates; and Heywood and Wei (2004) who offer an extensive study of six methods of pay, favouring individual performance pay.

wage theory, but find that the linkage is mediated by the impact of high-powered incentives on employee self-selection: these incentives attract better employees who then deploy more effort.

Whereas introducing a measure of nominal pay in the dataset would not be feasible due to its endogeneity - and, in any case, a continuous wage variable was not available in the dataset where only a banded measure of the nominal wage is available – the present chapter seeks to generate knowledge of the relationship between various methods of pay and job satisfaction. Indeed, Judge and Welbourne (1994) show that compensation satisfaction is a multidimensional concept¹⁸. Therefore, this chapter takes into account different methods of pay such as seniority-based pay and different types of incentive-based pay, and posits that it is a valid and relatively novel concern to research their impact on satisfaction.

This chapter also proposes to delve deeper into the analysis of varied pecuniary incentives, by looking at the impact of pay distribution on job satisfaction. In fact, studies on pecuniary rewards show that it is relative income rather than nominal income that matters more in employee motivation (Hamermesh, 2001; Clark and Oswald, 1996; Shields and Price, 2002).

The evidence on the effects of relative pay on job satisfaction is mixed. Clark and Oswald (1996) show that workers' reported level of well-being is weakly correlated with their relative income, whereas Belfield and Harris (2002) find no evidence of such a relationship for those working in higher education.

¹⁸ For instance, some employees may be satisfied with the nominal wage but dissatisfied with the method in which it is implemented in operation, whereas their colleagues may feel the other way around (Folger and Konowsky, 1989)

Relatively little is known beyond particular case studies about the impact of pay distribution within a firm on worker performance on job satisfaction.¹⁹, ²⁰ This is intriguing because there is a growing literature which fervently advocates the implementation of contingent, and implicitly variable, pay structures that encourage wage dispersion.²¹ Despite this, it is actually difficult to sign the effect of the pay distribution within a firm on workers' job satisfaction, but the tendency has been to test for a negative effect of highly dispersed compensation schemes on performance.²²

There are particularly very few studies that seek to examine the relationship between the pay distribution within a firm measured via the worker's *perception* of that distribution, and individual worker performance or their job satisfaction.²³ An exception is Bloom and Michel (2002) who discuss the advantages

¹⁹ For a few notable exceptions see: Kennedy (1997) warns of the negative consequences of highly dispersed compensation; Brown (2001) focuses on pay referents based on the study by Blau (1994); or Bloom and Michael (2002) analyse pay dispersion in managerial compensation schemes and find it to be contingent on managerial tenure. In general, studies that focus on the relationship between pecuniary incentives and job satisfaction do not include any measure of pay dispersion.

²⁰ It can also be noted that if one thought to glance at the political domain as a reflection of economic tastes for equality, the observed tendency in western political systems is to move towards socialist governments (which might be said to be the consequence of a shared societal dislike of highly dispersed income distributions). But, even if one were to consider the political scene of a country in order to try to assess the respective nations' tastes for equality at some given point in time, it is still difficult to estimate equality preferences in the long run. For instance, there is evidence that former communist countries, where socialist reforms had imposed egalitarian pay systems, have embraced in the post-communist period political reforms leading to higher income dispersion, and that residents of these countries have adjusted their views towards being more welcoming to inequality (Blanchflower and Freeman 1997). There is also evidence that western economies which have had no communist influences, such as France or the UK, and where one would expect to see rather non-egalitarian systems of pay, have moved in the past decade towards voting in governments with a rather more leftist / socialist agenda. Nevertheless, in Britain, the Labour Party's reforms have been criticised as being influenced by the right-wing policies, Thompson describing New Labour's economic thinking as signalling 'the death of socialist political economy in Britain' (Thompson 2006: 335). Therefore, it appears that one cannot make inferences with regard to a population's preferences for equality based on the policies implemented by the prevailing political party. This is because these policies cannot be said to reflect reliably the preferences of the society as a whole (and of the employees).

²¹ However, evidence on the incidence of these practices has been continuously accumulating in the UK, US and other countries (Addison and Belfield, 2001; Arthur 1992; Bailey *et al* 2001; Osterman, 1994; Pfeffer, 1998; and Wood, 1999).

²² See Hambrick and Siegel (1997) and Pfeffer and Langton (1993) for a brief discussion of why this remains a conundrum, as well as evidence that they also test for a negative effect.

²³ The benefits of including subjective (such as perception-based) variables in research have been highlighted ever since Freeman (1978) who remarks: 'while there are good reasons to treat subjective

and disadvantages of dispersed and compressed 'actual' pay structures. Dispersed pay structures may induce higher levels of performance as employees have to work harder to move up the pay ladder. This is consistent with the notion of promoting the 'star' workers in a competitive environment and the provision of compensating pay differentials for high-risk jobs.

However, dispersed pay systems may also be linked to workforce instability and higher turnover. The latter effect is in accordance with the prediction of tournament theory whereby the 'winners' stay with the company in order to compete in further tournaments, but 'losers' are implicitly expected to leave or to face truncated careers (Bloom and Michel, 2002). On the other hand, compressed pay promotes team effort and cooperation by creating a more egalitarian workplace, which tends to reduce turnover (Beaumont and Harris, 2003). Nevertheless, compressed pay systems may discourage effort above a certain minimal necessary level, and may be perceived as unfair because of being open to free-rider problems.

Lastly, one of the main claims of studies on the effects of HRM practices in organisations is that they were (intended to be) a substitute for unionisation. In the management literature, the HRM trend is presented as a win-win solution, with increased organisational productivity for employers and a more favourable working climate for employees for instance by improving employee job satisfaction or pay.

However, its advantages remain highly disputed in the economics literature. For instance, instead of increasing, job satisfaction levels in the Anglo-

variables gingerly, the answers to questions about how people feel toward their job are not meaningless but rather convey useful information about economic life that should not be ignored' (Freeman 1978 : 135).

Saxon economies do not appear to have changed; in fact, job satisfaction is sometimes found to have decreased (Blanchflower *et al* 1993, Oswald 1997, Easterlin 2001, Bunting 2004, Gallie 2005, Rose 2005). Moreover, Machin and Wood (2004) use British workplace data and do not find evidence in support of the HRM / union substitution hypothesis, concluding that union decline in Britain is not related to the increasing incidence of HRM practices.

Some studies suggest the hypothesis that unions may trigger job dissatisfaction. Bryson *et al* (2003) use the matched employer-employee data available in WERS 98 to test the hypothesis that unions may incite job dissatisfaction, more specifically to test the implied causation that union membership decreases overall job satisfaction and satisfaction with pay. Employees who expressed most satisfaction or dissatisfaction about overall job issues tend to be union members, as if non-union membership were a more predominant feature of individuals who focus their satisfaction or dissatisfaction on one job facet, or who do not even have preferences. Indeed, union membership and job satisfaction may be jointly determined, with the exception that degrees of pay satisfaction reported are similar for members and non-members. Authors conclude that membership appears to be endogenous with respect to satisfaction, as for a sub-set of union members job dissatisfaction is ‘...innate rather than the result of bad working conditions. It is this that leads them to both join the union and rank themselves dissatisfied’. Furthermore, Bryson *et al* (2003) find that unions manage to provide their members with a ‘compensating pay differential’ for less desirable characteristics of their jobs.

3.3. Data, hypotheses and econometric methodology

3.3.1. Datasets: CERS and WERS

Two British datasets are used for the empirical analysis: The *Changing Employment Relationships, Employment Contracts and the Future of Work Survey* (CERS in this chapter) and The *Workplace Employment Relations Survey 1998* (WERS or WERS 98 in this chapter).

CERS was commissioned by the Policy Studies Institute as part of the *Future of Work* research programme. This data was collected between July 2000 and January 2001, and the main aim of the Survey was to identify and describe the key changes in British employee relations. Two data collection methods were used: interviews and self-completion questionnaires. The one-hour interviews were personal, paper-based, conducted in the home, and totalled 2,466. Self-completion questionnaires were issued together with the interviews and returned by 2,349 respondents, which represents a 95-percent response rate. Once respondents with missing values on key variables and the self-employed are omitted (334 respondents), the sample drops to 1,518.

WERS 98 contains a much larger sample of workers than CERS (19,890 allowing for missing data), and has the advantage that responses are obtained from both employees and their managers. The survey was conducted in the period from October 1997 to July 1998. The structure of WERS 98 consists of a cross-section and a panel survey. The cross-sectional WERS 98 survey was conducted on 3,200 workplaces selected from the Interdepartmental Business Register, assuming an overall

yield of 70 percent. Data was obtained from 2,000 workplaces with 25 or more employees, and 250 workplaces with 10 to 24 employees.²⁴ The survey consisted of interviewing the employees, their representative and the employee relations manager of the workplace, in order to capture a balanced picture from both employees' and management's point of view. On employees' side, a 45 minute interview was conducted with either the senior lay representative of the recognised union with the largest coverage at the workplace, or with the senior employee representative on a joint consultative committee. Additionally, for the first time in the WIRS series, 25 employees were chosen at random and sent a self-completion questionnaire. All employees were sent the questionnaires in workplaces with less than 25 employees. On management's side, the senior workplace manager responsible for the day-to-day employee relations matters was interviewed for 90 to 100 minutes, and a data sheet was completed. This chapter uses the joint employee-manager questionnaire to get a combined picture of employment relations from both perspectives.

An advantage of the CERS data over WERS is that it contains a question on overall job satisfaction: "How satisfied or dissatisfied are you with the work itself?", which is reported in Table 3.1.

²⁴ An allowance was made at the Interdepartmental Business Register in the selection of workplaces for not in scope and non-response.

Table 3.1 The distribution of overall job satisfaction (CERS)

	Frequency	Percent
Completely satisfied	230	10.79
Very satisfied	730	34.24
Satisfied	831	38.98
Neither satisfied nor dissatisfied	164	7.69
Dissatisfied	117	5.49
Very dissatisfied	26	1.22
Completely dissatisfied	24	1.13
Total	2, 132	

Note: 10 respondents did not state their level of job satisfaction.

The majority of the respondents to the survey are satisfied with their job (84% report some level of satisfaction; 8% are neutral; 8% report some level of dissatisfaction), the modal group being ‘satisfied’ (39%). The distribution of job satisfaction observed in Table 3.1 is consistent with other British studies and shows that the reported levels of satisfaction are very high (Blanchflower *et al* 1993, Millward *et al* 1999, Oswald and Gardner, 2001). These results may reflect a self-selection effect insofar as workers sort themselves into the jobs that they like and quit those they dislike. However, this explanation over-states workers’ ability to find a suitable job match. There are very few observations in some categories and hence job satisfaction is collapsed into five discrete categories (see below).

A drawback of the WERS is that it does not contain an equivalent question on overall job satisfaction, but instead asks workers about their satisfaction with their pay: “How satisfied are you with the amount of pay you receive?”. An equivalent question is asked in the CERS on workers’ satisfaction with pay “How satisfied or dissatisfied are you with your pay?”, and hence the distribution of workers’ satisfaction with their pay is also modelled, as shown in Tables 3.2A and 3.2B. In CERS, 59%

report some level of satisfaction with pay, 14% are neutral, and 27% report some level of dissatisfaction, with the modal group being satisfied with their pay (46%). In WERS, 35% report some level of satisfaction with pay, 23% are neutral, and 40% are dissatisfied, with the modal group being satisfied with their pay (32%).

Table 3.2A The distribution of satisfaction over pay (CERS)

	Frequency	Percent
Completely satisfied	59	2.77
Very satisfied	215	10.08
Satisfied	976	45.78
Neither satisfied not dissatisfied	301	14.12
Dissatisfied	403	18.90
Very dissatisfied	101	4.74
Completely dissatisfied	64	3.00
Total	2, 119	99.39

Note: Out of the 2,132 respondents in the dataset, for 1 respondent, the question was not applicable, and 12 respondents did not state their level of satisfaction with pay.

Table 3.2B The distribution of satisfaction over pay (WERS)

	Frequency	Percent
Very satisfied	970	3.43
Satisfied	9,011	31.91
Neither satisfied nor dissatisfied	6,568	23.26
Dissatisfied	7,885	27.92
Very dissatisfied	3,480	12.32
Total	27, 914	98.84

Note: 1.16 percent of respondents (326) did not answer the question, or answered 'I don't know'.

Differences between the distribution of the two variables for satisfaction with pay may be due to the fact that CERS samples a different subset of employees, which is in size only 8% of the WERS sample. Additionally, differences may be due to data for the two surveys being collected in slightly different periods of time (WERS: October 1997 - July 1998, CERS: July 2000 - January 2001), and, consequently, due to

Britain experiencing slightly different influences upon its economy, politics and society.²⁵

The CERS and the WERS datasets differ in that the former has a larger proportion of workers from small firms (i.e. those with less than 10 employees), whereas the WERS excludes establishments with fewer than 10 employees. This means that WERS excludes in its sampling frame 73% of the total of 1.3 million establishments in the UK (Cully *et al*, 1999). The critical advantage gained from using CERS becomes even clearer when one considers the considerable bias in the extant economic literature which favours large organisation studies due to easier availability of data. However, by number of employees, WERS has taken into account for its sampling frame 82% of the total employee population. In conclusion, WERS is more representative of the employee population, whereas CERS is more representative of the establishment population since CERS includes in its sampling frame those workplaces / companies / organisations (these terms are used in CERS interchangeably) with under 10 employees. These two datasets can thus be seen as complements in this analysis. For a more detailed comparison between the datasets, please see Appendix B.1.

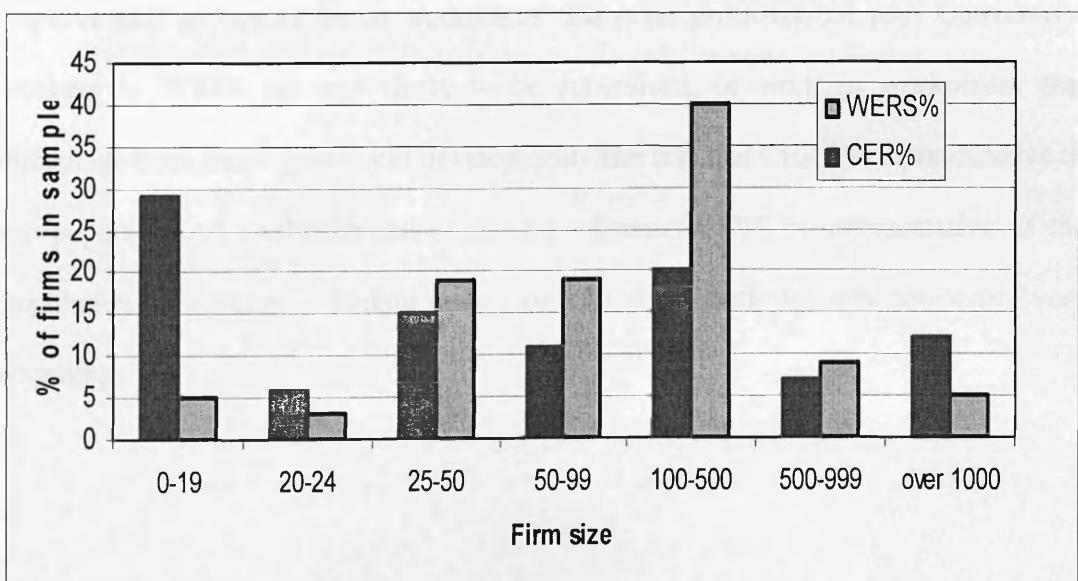
As shown in Figure 3.1, WERS includes more large workplaces than CERS, and one could assume that there is a higher scope for more generous pay schemes in large workplaces / firms. In fact, one would expect large firms to be associated with higher levels pay than small firms. This is a stylised fact of the labour market known in labour economics as the firm size wage effect. So, it may be puzzling

²⁵ 1997 is when the Labour Party came to power in Britain, whereas by 2001 the effervescence surrounding an election would be expected to have become a bit more subdued.

to note that workers sampled in WERS are less satisfied with their pay than workers sampled in CERS.

Nevertheless, the firm size wage effect does not imply that *satisfaction* with pay is also higher in large firms. For instance, even though workers may receive a higher pay in large firms, relative-pay comparisons within large firms may leave workers feeling “dissatisfied” with a particular level of pay, whilst that same level of pay may make workers who are employed in small firms rate themselves as “satisfied” with their pay. This is also because there would be a higher likelihood that in a large firm one’s level of pay was ranked towards the lower side of within-firm pay distribution. This likelihood would be higher if one were part of a more numerous workforce, a workforce which is also known to have relatively higher levels of pay than the rest of the labour market, such as is the case of large firms.

Figure 3.1 Comparative distribution of organisations (CERS) and workplaces (WERS) by employee size (% in sample from CERS and WERS)



Descriptive statistics for all variables constructed from both datasets are shown in Appendix B.2 while Appendix B.3 compares the means for all covariates for the CERS and the WERS. Variables for HRM and pay inequality variables are constructed from the questions listed in Appendix B.4. Appendix B.3 allows for comparison between the sample means for the variables extracted from the two datasets. It is clear that the CERS has fewer professional workers and more managerial/intermediate technical workers than the WERS.

To allow a comparison of the findings from these two datasets this chapter uses a set of covariates that are encoded to be as consistent as possible. In terms of HRM practices, the following sets of variables are identified: work organisation, supervision, employee involvement/voice, recruitment and selection, training and learning, and pay practices. In addition, variables for the workers' perception of pay inequality in the workplace and whether the workplace is unionised are included.²⁶

Workers in CERS are less likely to work in teams, get involved in improvement groups or be in workplaces that offer profit-related pay. Conversely, workers in WERS are less likely to be supervised, or work in workplaces that encourage both training and skill development. The fact that CERS is representative of the population of establishments in Britain whereas WERS is representative of the population of workers in Britain makes an analysis of both datasets potentially very revealing.

²⁶ The comparison of the two datasets can only be performed with respect to the workers' satisfaction with their pay, since the WERS dataset does not include a variable for overall job satisfaction.

3.3.2. Hypotheses

The first hypothesis of this chapter tests whether HRM practices have an impact on job satisfaction, being based on the results of the extant literature and aiming to contribute to a deeper understanding of the link between HRM practices and job satisfaction:

Hypothesis 1: Certain HRM practices (specifically if selected from an enlarged set of practices that takes into account the extant literature), have a positive impact on job satisfaction. In particular, the HRM practices expected to have a positive impact are: teamwork, job design, job autonomy, employee involvement and communication.

Secondly, based on (a) the assumptions made in the psychology literature with regard to the fact that nominal pay itself may not be a good motivator, but that other forms of pecuniary rewards are; and on (b) the assumption from the limited economics literature, the following hypothesis is tested with the available methods of pay in the datasets:

Hypothesis 2: Methods of pay other than nominal wages, such as seniority-based pay and other incentive-based forms of pay, have a positive impact on job satisfaction.

A third objective of this chapter is to use the available measure of perceived pay dispersion in order to analyse the impact of perceived pay inequality on workers' job satisfaction. Acknowledging that it is difficult to sign the expected effect,

due the limited and undecided literature on this topic, the choice is made to test for a negative effect of a highly unequal perceived pay distribution on British employee satisfaction:

Hypothesis 3: A perceived high degree of pay dispersion has a negative impact on job satisfaction.

The last objective of this chapter is to investigate whether HRM practices have a smaller impact on the job satisfaction of union members as opposed to non-union members. It could be argued that a lower impact of HRM practices on union members would be expected, since union members do already have the advantage over their counterparts of using the unions as a ‘voice’ mechanism:

Hypothesis 4: Union membership mediates the relationship between workplace practices and job satisfaction, and HRM practices have a lower impact on job satisfaction for union members.

3.3.3. Econometric methodology

The unit of analysis in both datasets is the employee. Following the theory and previous literature discussed above, job satisfaction, S , can be expressed as:

$$S_i = \beta_1'X_i + \beta_2'HRM_i + \beta_3'INEQUALITY_i + u_i \quad (1)$$

where X refers to a vector of worker, job and firm characteristics, including whether the worker is a union member, β' are coefficients to be estimated, and i is the subscript for an individual worker.²⁷ Worker characteristics include their age, gender, marital status, number of children, and highest educational qualification, whereas the job and firm characteristics include the workers occupation/skill level and firm size. Unlike the previous literature, a vector of variables reflecting human resource management practices, *HRM*, are included in the model. These are classified under the following headings: (i) work organisation, (ii) supervision, (iii) employee involvement, (iv) recruitment and selection, (v) training and learning, and (iv) pay practices, including seniority-based pay and performance-related pay. This classification follows organic delineations and aims to bring together in one place the vast majority of HRM practices used in the HRM literature which are entered hereby in a labour economics model; thus, this study constitutes a bridging point between HRM and labour economics. Finally, *INEQUALITY* refers to the workers' perception of the pay distribution in the firm, and in particular to the extent to which this distribution is regarded as too unequal.

Hamermesh (2004) has warned about the inclusion of subjective covariates when the dependent variable is itself subjective. In this chapter, the dependent variable is subjective, yet so is the independent variable *INEQUALITY*. The inclusion of this particular latter variable can be defended on the grounds that perception of pay is probably a most important factor in decisions made by workers with regard to their satisfaction with their pay.

²⁷ Note that an identical specification is adopted for satisfaction with pay.

It is clear from Tables 3.1 and 3.2A that in CERS overall job satisfaction and satisfaction with pay are measured on an ordinal scale,, however, since there is a lack of data on some categories of dissatisfaction, it is necessary to combine them. This gives the following classification for overall job satisfaction and for satisfaction with pay in CERS (more details in Appendix B.5 in Panels 1 and 2):

$Y = 5$ completely satisfied

$Y = 4$ very satisfied

$Y = 3$ satisfied

$Y = 2$ neither satisfied nor dissatisfied

$Y = 1$ dissatisfied, very dissatisfied, or completely dissatisfied.

In CERS, the questionnaire rates (dis)satisfaction with the job and with pay on a three-level scale on either side of neutrality: (dis)satisfied, very (dis)satisfied, and completely (dis)satisfied. However, in WERS, the questionnaire rates (dis)satisfaction with pay only a two-level scale on either side of neutrality, with the (minimum) maximum levels of (dis)satisfaction being “very (dis)satisfied” (see Appendix B.5). So, unlike in CERS, in WERS there is less information available in the ordinal scale. Hence there is less scope in WERS for collapsing the ordinal scale into fewer levels like in CERS.

The ordinal scale adopted in this chapter for the dependent variable “satisfaction with pay” in WERS is actually the same as the ordinal scale in the original dataset variable in WERS:

$Y = 5$ very satisfied

$Y = 4$ satisfied

$Y = 3$ neither satisfied nor dissatisfied

$Y = 2$ dissatisfied

$Y = 1$ very dissatisfied.

Since job satisfaction and pay satisfaction are ordinal variables in both WERS and CERS, an ordered probit model is estimated, which assumes that there is an unobserved random variable, Y^* , such that:

$$Y_i^* = \beta_i' X + \varepsilon_i, \quad \varepsilon_i \sim N[0,1] \quad (2)$$

The observed counterpart to Y^* is the categorical variable Y , ordered as follows:

$$Y = \begin{cases} 0 & \text{if } Y^* \leq \mu_0 \\ 1 & \text{if } \mu_0 < Y^* \leq \mu_1 \\ 2 & \text{if } \mu_1 < Y^* \leq \mu_2 \\ 3 & \text{if } \mu_2 < Y^* \leq \mu_3 \\ \vdots & \\ \vdots & \\ J & \text{if } Y^* > \mu_{j-1} \end{cases} \quad (3)$$

where $\mu_1, \mu_2, \mu_3, \dots, \mu_{j-1}$ are the cut-points, with a constant $\mu_0 = 0$. Since $\varepsilon \sim N[0,1]$ then

$$\begin{aligned}
 P(Y = j) &= P(\mu_{j-1} < Y^* \leq \mu_j) = \\
 &= P(\mu_{j-1} - \beta' X < Y^* - \beta' X < \mu_j - \beta' X) = \\
 &= P(\mu_{j-1} - \beta' X < \varepsilon \leq \mu_j - \beta' X) = \\
 &= \Phi(\mu_j - \beta' X) - \Phi(\mu_{j-1} - \beta' X)
 \end{aligned} \tag{4}$$

where Φ is the standard normal distribution function.

The likelihood for an individual is then:

$$L_i = \prod_{j=1}^m \left(\int_{\mu_{j-1} - \beta' X}^{\mu_j - \beta' X} \Phi(u) du \right)^{d_{ij}} \tag{5}$$

where $d_{ij} = 1$ if the i th observation (worker identifier) is in the j th job satisfaction category, for $i=1,2,\dots,n$ and for $j=1,2,\dots,m$.

In order to check the consistency of results, this chapter reports results for job satisfaction and pay satisfaction in an ordinal scale form, but also in a collapsed binary (also called binomial) form. So, in addition to the ordered probit models explained above, a binary probit model is used in order to make possible more comparisons between the datasets. A binary probit follows the same methodology as an ordinary probit where the dependent variable is a dummy variable taking only two values: 0 or 1.

For ease of interpretation, the overall job satisfaction responses (respectively, the pay satisfaction responses) are collapsed into a binary variable form where a value of 1 denotes satisfied or better, and a value of 0 denotes neutrality or

some level of dissatisfaction. In more detail, the CERS variable for overall job satisfaction takes the value 1 for 84 % of the sample, and the CERS variable for satisfaction with pay takes the value 1 for 59% of the sample. The WERS variable for satisfaction with pay takes the value 1 for 35% of the sample. Appendix B.5 gives a snapshot view of the way in which binary and ordinal variables were generated for both the ordinal and the binary probit.

In further support of the methodology chosen, it is to be noted that there is no standard methodology commonly agreed in the literature.²⁸ In this chapter, marginal effects from the ordered probit model and the binary probit model are reported along with the p-value on the underlying coefficient estimates. In WERS, the binary and ordered probit are both run with the option of clustering by workplace, which ensures that standard errors are robust.

It is important to note that in CERS all HRM practices relate directly to the individual questioned experiencing the impact of these HRM practices. However, in WERS, 8 of the total 19 HRM practices relate only to the presence of the practice in the workplace where the individual employee works and it is not clear whether or not the specific individual under review is experiencing the direct HRM practice. This is because some of the HRM practice variables come from the manager questionnaire

²⁸For instance, a brief review shows that:

- logit models are used by Neumark and Postlewaite (1995), Allen and Velden (2001), Hamermesh (2001), Brown and Sessions (2003), Nguyen *et al* (2003);
- ordered logits are used by Batt and Appelbaum (1995), Blanchflower and Oswald (1999);
- probit models are used by Akerlof *et al* (1988), Booth *et al* (2002),
- ordered probits are used by Oswald and Warr (1996), Levy-Garboua and Montmarquette (1997), Clark (1999), Groot and Brink (1999), Ward and Sloane (1999), Elvira and Town (2001), Belfield and Harris (2002), Sloane and Ward (2001), Shields and Price (2002), Brown and Sessions (2003), Heywood and Wei (2004), Bryson *et al* (2005)
- factor or hierarchical analysis is used by Argyle (1989), Blau (1994), Birdseye and Hill (1995), Oswald and Warr (1996), Brown (2001), Bhuian and Menguc (2002)

related to the workplace, rather than the employee questionnaire (see Appendix B.4, specifically the questions where the “HR Manager is asked”). Consequently, the results reported from the WERS dataset specifically with regard to the following 8 HRM practices may be underestimated in the WERS dataset since one cannot be sure whether the respondents were actually experiencing the direct impact of: teamwork; supervision of work; usage of improvement groups; usage of formal suggestion scheme; incidence of profit-sharing schemes; pay based on tenure; incidence of performance-related pay; and a measure of pay equality.

3.4. Discussion of results

3.4.1. The effect of HRM practices

This discussion begins with the effect of HRM practices in an ordinal probit model and a binomial probit model on overall job satisfaction, as reported in Panel A and Panel B of Table 3.3, and then continues with their effect on satisfaction with pay in CERS in Table 3.4 and in WERS in Table 3.5. The consistency of results is shown in each of these tables (as well as in Tables 3.6 to 3.8), since it can be observed that the binary and ordinal probit models report very similar effects, of very similar levels of significance.

Table 3.3 (Panel A) The effect of HRM practices and perceived pay inequality on overall job satisfaction (CERS) - Marginal Effects from binomial and ordinal probit

VARIABLES	Binomial model		Ordinal model					
	P-values	Satisfied	P-values	Completely satisfied	Very satisfied	Satisfied	Neutral	Dissatisfied
	<i>Work organisation</i>							
Teamwork	0.106	0.023	0.087*	0.015	0.025	-0.018	-0.010	-0.012
	<i>Supervision</i>							
Performance differentiated from others	0.111	0.054	0.075*	0.017	0.030	-0.020	-0.012	-0.015
Employee can be seen all the time by supervisor or manager	0.004***	-0.054	0.006***	-0.025	-0.041	0.030	0.017	0.020
Work progress can be visually assessed	0.038**	0.028	0.041**	0.019	0.031	-0.022	-0.013	-0.015
	<i>Employee involvement / voice</i>							
Information dissemination	0.537	0.016	0.545	-0.008	-0.012	0.009	0.005	0.006
Employee part of an improvement group	0.251	0.023	0.805	0.002	0.004	-0.003	-0.002	-0.002
Formal suggestion scheme	0.752	-0.006	0.220	0.012	0.019	-0.014	-0.008	-0.009
Management holds meetings were employees	0.001***	0.140	0.000***	0.049	0.091	-0.054	-0.037	-0.049
	<i>Recruitment & selection</i>							
Initial pay is negotiable	0.051*	0.040	0.032**	0.023	0.035	-0.027	-0.014	-0.017
	<i>Training & learning</i>							
Employer provided education or training	0.082**	0.033	0.735	0.003	0.005	-0.004	-0.002	-0.002
Job requires on-going learning	0.000***	0.093	0.000***	0.052	0.109	-0.053	-0.044	-0.063
	<i>Seniority-based pay</i>							
Pay based on tenure	0.005***	0.051	0.003***	0.028	0.043	-0.033	-0.018	-0.021
	<i>Performance-related pay</i>							
Own performance	0.162	0.032	0.578	0.006	0.010	-0.008	-0.004	-0.005
Team performance	0.475	-0.021	0.540	-0.008	-0.014	0.010	0.006	0.007
Company performance	0.862	-0.004	0.258	-0.014	-0.023	0.016	0.009	0.011
Profit-share/share option	0.256	0.028	0.563	0.008	0.012	-0.009	-0.005	-0.006
	<i>Perception of relative income</i>							
Own pay is relatively low	0.000***	-0.103	0.000***	-0.055	-0.101	0.061	0.041	0.054
	<i>Perceived workplace inequality</i>							
Pay gap is much too big	0.000***	-0.156	0.000***	-0.049	-0.095	0.053	0.039	0.052
Pay gap is too big	0.000***	-0.108	0.000***	-0.043	-0.079	0.049	0.032	0.042
Binomial model: Sample size = 1,518; Log likelihood = -552.22; LR chi2(47) = 250.50								
Ordinal model: Sample size = 1,518; Log likelihood = -1938.79; LR chi2(30) = 314.87								

Note 1: "Satisfied" in the binomial model includes "Completely satisfied", "Very satisfied" and "Satisfied"

Note 2: "Dissatisfied" in the ordinal model includes "Dissatisfied", "Very dissatisfied" and "Completely dissatisfied"

Note 3: The significance level of the p-value is signalled using: *** for p<0.01, ** for p<0.05, and * for p<0.1

In relation to Hypothesis 1, namely that certain HRM practices have a positive impact on job satisfaction, the results in Table 3.3 show that after controlling for a wide range of personal, job and firm characteristics (reported in Panel B, Table 3.3), several HRM practices have a statistically significant effect on job satisfaction.²⁹

Table 3.3 (Panel B) The effect of personal, job and firm characteristics on overall job satisfaction (CERS) - Marginal Effects from binomial and ordinal probit

VARIABLES	Binomial model		Ordinal model					
	P-values	Satisfied	P-values	Completely satisfied	Very satisfied	Satisfied	Neutral	Dissatisfied
Age	0.079*	-0.012	0.072*	-0.006	-0.010	0.007	0.004	0.005
Age squared	0.080*	0.000	0.090*	0.000	0.000	0.000	0.000	0.000
Gender (male)	0.000***	-0.083	0.000***	-0.039	-0.063	0.046	0.026	0.031
Separated, divorced or widowed	0.843	0.005	0.728	-0.004	-0.007	0.005	0.003	0.004
Single	0.252	-0.029	0.073*	-0.021	-0.036	0.024	0.015	0.018
One child	0.955	-0.001	0.257	-0.013	-0.022	0.015	0.009	0.011
Two children	0.591	-0.015	0.469	-0.009	-0.016	0.011	0.006	0.008
More than two children	0.800	0.010	0.522	0.013	0.020	-0.016	-0.008	-0.010
Degree or higher degree	0.636	0.011	0.670	0.005	0.008	-0.006	-0.003	-0.004
A-level or equivalent	0.128	0.044	0.631	0.007	0.012	-0.009	-0.005	-0.006
No qualification	0.037**	0.048	0.000***	0.055	0.072	-0.065	-0.030	-0.033
Professionals	0.388	0.031	0.362	0.018	0.026	-0.021	-0.011	-0.012
Skilled non-manual	0.858	0.005	0.518	-0.008	-0.013	0.009	0.005	0.007
Skilled manual	0.225	0.031	0.554	0.008	0.013	-0.010	-0.005	-0.006
Partly skilled/semi-skilled	0.058*	0.052	0.475	0.011	0.017	-0.013	-0.007	-0.008
Unskilled	0.617	-0.026	0.956	0.001	0.002	-0.002	-0.001	-0.001
Union member	0.277	-0.023	0.123	-0.016	-0.026	0.018	0.011	0.013
Permanent part-time	0.097*	0.044	0.001***	0.052	0.068	-0.061	-0.028	-0.031
No permanent job	0.850	-0.006	0.908	-0.002	-0.003	0.002	0.001	0.001
Employees > 1000	0.658	0.015	0.350	-0.015	-0.026	0.017	0.011	0.013
500 – 999	0.316	0.036	0.672	0.008	0.013	-0.010	-0.005	-0.006
100 – 499	0.668	0.012	0.994	0.000	0.000	0.000	0.000	0.000
50 – 99	0.911	-0.004	0.086*	-0.026	-0.048	0.029	0.020	0.025
25 – 49	0.653	0.014	0.120	-0.022	-0.040	0.025	0.016	0.021
20 – 24	0.140	0.056	0.648	0.010	0.015	-0.011	-0.006	-0.007
11 – 19	0.384	0.029	0.979	0.000	0.001	-0.001	0.000	0.000
Public sector	0.002***	0.097	0.001***	0.041	0.060	-0.048	-0.024	-0.028
Other	0.381	0.035	0.852	-0.004	-0.006	0.005	0.003	0.003

Binomial model: Sample size = 1,518; Log likelihood = -552.22; LR chi2(47) = 250.50

Ordinal model: Sample size = 1,518; Log likelihood = -1938.79; LR chi2(30) = 314.87

Note: Base group: Female, married, high school qualification (i.e. GCE/GCSE), no children, permanent full time contract, manager, non-union member, private sector and micro firm (i.e. less than 10 employees).

²⁹ Since many of the findings for the personal, job and firm characteristics are in keeping with the existing literature, this discussion does not dwell on them.

Creating workplaces which embed 'on-going learning' has a highly significant effect on job satisfaction, insofar as it increases the probability of a worker being either completely or very satisfied by sixteen percentage points (see Training and learning). This result is consistent with the HRM literature where on-the-job learning figures prominently among practices that enhance employee motivation and commitment. For instance, Doeringer et al (1998) find that US companies adopting Japanese workplace practices tend to emphasise 'social and organisational learning' and to offer career employment and high wages. In turn, employees reciprocate by increased effort and productivity. Interestingly, the provision of employer provided education and training is insignificant, suggesting that workers prefer continuous on-the-job instruction to off-the-job training.

More importantly, this result is positively surprising insofar as it shows the large size of the impact of training on job satisfaction. By uncovering that the impact of training and learning practices is the highest out of all HRM practices entered in the models, this chapter contributes significantly to a literature that is still developing, whereby the link between on-going learning and job satisfaction has been previously under-researched. Georgellis and Lange (2007) offer a further up-to-date discussion of the novelty factor in researching the impact of training on job satisfaction.

In the model for satisfaction with pay, the training variables are constructed so that they are comparable between CERS and WERS (Tables 3.4 and 3.5). Firms are classified into those that offer either training or continuous skill development, those that offer both training and skill development, which are compared to the base firms that offer neither. For CERS there is no statistically significant relationship between

the training variables and satisfaction with pay (see Table 3.4), whereas for WERS workers who receive training and encouragement to develop skills are more satisfied with their pay (see Table 3.5). Furthermore, those workers who work in firms that offer both training and encouragement to develop skills are more likely to report that they are 'very satisfied' or 'satisfied' with their pay (compare the marginal effects of 0.17 and 0.08). One explanation for the difference in the results between CERS and WERS may be the fact that CERS contains a higher proportion of micro firms, which typically offer very little training or opportunity for continuous skill development, whereas the WERS includes more medium-large firms, which tend to offer more training.

Table 3.4 The effect of HRM practices and pay practices on satisfaction with pay (CERS) - Marginal Effects from binomial and ordinal probit

VARIABLES	Binomial model		Ordinal model					
	P-values	Satisfied	P-values	Completely satisfied	Very satisfied	Satisfied	Neutral	Dissatisfied
<i>Work organisation</i>								
Teamwork	0.949	-0.002	0.894	0.000	-0.001	-0.002	0.001	0.003
<i>Supervision</i>								
Supervision of work progress	0.121	0.048	0.395	0.003	0.007	0.012	-0.004	-0.018
Employee can be seen all the time by supervisor or manager	0.240	-0.035	0.763	-0.001	-0.003	-0.004	0.001	0.006
<i>Employee involvement / voice</i>								
<i>Information dissemination via...</i>								
...notice boards	0.473	-0.023	0.095	-0.005	-0.015	-0.023	0.008	0.035
...newsletter or internal magazine	0.085*	-0.045	0.035**	-0.007	-0.020	-0.031	0.011	0.048
...email or website	0.953	-0.002	0.458	0.003	0.007	0.012	-0.004	-0.018
<i>Involvement in decision making</i>								
Improvement groups	0.993	0.000	0.738	0.001	0.003	0.005	-0.002	-0.007
formal suggestion schemes	0.884	0.005	0.852	0.001	0.002	0.003	-0.001	-0.004
Meetings where employees can express their views	0.008**	0.093	0.001***	0.010	0.030	0.056	-0.015	-0.081
<i>Recruitment & selection</i>								
Initial pay is negotiable	0.014*	0.066	0.022**	0.008	0.022	0.033	-0.012	-0.051
<i>Training & learning</i>								
Both training and skill development are encouraged	0.900	0.006	0.540	-0.003	-0.009	-0.014	0.005	0.021
Either training or skill development is encouraged	0.478	-0.034	0.496	-0.003	-0.009	-0.015	0.005	0.022
<i>Seniority-based pay</i>								
Pay related to tenure	0.000**	0.102	0.000***	0.012	0.033	0.050	-0.018	-0.077
<i>Performance related pay</i>								
Individual performance	0.003**	0.111	0.001***	0.013	0.035	0.048	-0.019	-0.077
Team performance	0.500	0.030	0.342	0.004	0.012	0.018	-0.006	-0.028
Company performance	0.976	0.001	0.590	-0.002	-0.006	-0.010	0.003	0.015
Profit sharing / option schemes	0.008**	0.111	0.004***	0.014	0.036	0.047	-0.020	-0.076
<i>Perceived workplace inequality</i>								
Pay gap is much too big	0.000**	-0.351	0.000***	-0.025	-0.082	-0.203	0.028	0.283
Pay gap is too big	0.000**	-0.275	0.000***	-0.021	-0.066	-0.138	0.029	0.196
<i>Job autonomy- influence over ...</i>								
... job tasks	0.234	-0.040	0.672	-0.001	-0.004	-0.006	0.002	0.010
... pace of work	0.113	0.056	0.023**	0.007	0.021	0.039	-0.011	-0.056
... how job is done	0.736	-0.011	0.351	-0.003	-0.009	-0.014	0.005	0.021
<i>Union</i>								
Union member	0.843	-0.007	0.964	0.000	0.000	0.001	0.000	-0.001

Binomial model: Sample size = 1,496; Log likelihood = -882.06; LR chi2(51) = 273.02

Ordinal model: Sample size = 1,496; Log likelihood = -1,837.78; LR chi2(51) = 301.48

Note 1: "Satisfied" in the binomial model includes "Completely satisfied", "Very satisfied" and "Satisfied"

Note 2: "Dissatisfied" in the ordinal model includes "Dissatisfied", "Very dissatisfied" and "Completely dissatisfied"

Note 3: The significance level of the p-value is signalled using: *** for p<0.01, ** for p<0.05, and * for p<0.1

Note 4: The model also includes controls for age, gender, marital status, educational qualifications, occupation, contract type, firm size and sector. These results are available by request.

Table 3.5 The effect of HRM practices and pay practices on satisfaction with pay (WERS) - Marginal Effects from binomial and ordinal probit

VARIABLES	Binomial model		Ordinal model					
	P-values	Satisfied	P-values	Very satisfied	Satisfied	Neutral	Dissatisfied	Very Dissatisfied
	<i>Work organisation</i>							
Teamwork	0.761	0.005	0.876	0.000	-0.002	0.000	0.001	0.001
	<i>Supervision</i>							
Supervision of work progress	0.000***	0.030	0.003***	0.004	0.023	0.001	-0.015	-0.014
	<i>Employee involvement / voice</i>							
	<i>Information dissemination</i>							
Notice boards	0.020**	-0.037	0.015**	-0.005	-0.027	-0.001	0.017	0.015
Newsletter or internal magazine	0.000***	0.049	0.952	0.000	0.000	0.000	0.000	0.000
Email or website	0.672	-0.004	0.000***	0.007	0.038	0.003	-0.025	-0.023
	<i>Involvement in decision making</i>							
Improvement groups	0.327	0.009	0.367	0.001	0.006	0.000	-0.004	-0.004
Formal suggestion schemes	0.158	0.015	0.096*	0.002	0.013	0.001	-0.008	-0.008
Meetings where employees can express their views	0.000***	0.052	0.000***	0.007	0.045	0.005	-0.028	-0.029
	<i>Recruitment & selection</i>							
Management asks employees about pay	0.000***	0.029	0.000***	0.021	0.099	0.001	-0.066	-0.055
	<i>Training & learning</i>							
Both training and skill development are encouraged	0.000***	0.170	0.000***	0.028	0.138	0.004	-0.091	-0.080
Either training or skill development is encouraged	0.000***	0.083	0.000***	0.013	0.070	0.003	-0.046	-0.041
	<i>Seniority-based pay</i>							
Pay related to tenure	0.907	0.001	0.825	0.000	0.002	0.000	-0.001	-0.001
	<i>Performance-related pay</i>							
Performance related pay	0.246	0.013	0.160	0.002	0.011	0.001	-0.007	-0.007
Profit sharing/ option schemes	0.090*	0.020	0.170	0.002	0.012	0.001	-0.008	-0.007
	<i>Perceived workplace inequality</i>							
Pay gap is small	0.915	0.005	0.775	0.002	0.010	0.001	-0.007	-0.006
	<i>Job autonomy - influence over...</i>							
...job tasks	0.000***	0.046	0.000***	0.008	0.045	0.004	-0.028	-0.028
...pace of work	0.000***	0.057	0.000***	0.009	0.052	0.005	-0.033	-0.033
...how job is done	0.006***	0.033	0.004***	0.004	0.022	0.002	-0.014	-0.014
	<i>Union</i>							
Union member	0.733	-0.003	0.129	-0.002	-0.010	-0.001	0.006	0.006

Binomial model: Sample size = 19,890; Log pseudo-likelihood = -12070.64; Wald chi2(46) = 1334.56

Ordinal model: Sample size = 19,890; Log pseudo-likelihood = -27,317.11; LR chi2(46) = 1,928.30

Note 1: "Satisfied" in the binomial model includes "Very satisfied" and "Satisfied"

Note 2: The significance level of the p-value is signalled using: *** for p<0.01, ** for p<0.05, and * for p<0.1

Note 3: The model also includes controls for age, gender, marital status, educational qualifications, occupation, contract type, firm size and sector. These results are available by request.

Constant direct supervision, where the employee can be seen almost all the time by a supervisor or a manager, has a significant negative impact on job satisfaction, reducing the probability of being completely satisfied by 2.5 percentage points, which is offset by an increased risk of being dissatisfied (see *Supervision*, Table 3.3). In contrast, the fact that ‘work progress can be visually assessed’ by a supervisor has a small but positive effect on job satisfaction, increasing the probability of feeling completely or very satisfied by 5 percentage points. Thus, whereas close supervision of work is disliked, perhaps because it is associated with a feeling of being controlled, workers do like some feedback on their performance (and it could be that they also like to know that other workers are subject to some supervision too), suggesting that *some* monitoring is actually desirable. These findings are consistent with the view that HRM practices enhance employee participation, voice and creativity, thereby increasing job satisfaction, motivation and workplace performance. However, there is no evidence from CERS that these variables affect satisfaction with pay (see Table 3.4), whereas in WERS ‘supervision of work progress’ does have a statistically significant and positive effect on satisfaction with pay, albeit small in magnitude (see Table 3.5).

Table 3.3 shows that teamwork is only significant at the 10% level and although this kind of practice increases job satisfaction, the effects are quite small (see *work organisation*). Working in a team increases the probability of being completely or very satisfied by only 4 percentage points. The finding that teamwork has little effect on job satisfaction is interesting because it is often advocated as one of the most important HRM practices (Osterman 1994, MacDuffie 1995, Pfeffer 1995), and has been shown elsewhere to have a significant impact on employee productivity, commitment, and job satisfaction (Griffin 1988, Banker *et al* 1996, Batt and

Appelbaum 1995). The results are perhaps in keeping with the behaviour in organisation literature, which warns of the negative effects of increased pressure from peers in the team. Barker (1993) speaks of ‘concertive control’, whereby the management’s supervision is multiplied by peer surveillance. Furthermore, Parker and Slaughter (1988) introduce the concept of ‘management by stress’ to conjure up the effect of Japanese style practices on employee well-being. It is also interesting to note from Tables 3.4 and 3.5 that there is no statistically significant relationship between teamwork and workers satisfaction with their pay, as one might expect given the findings that workers are more satisfied when their own progress and performance are monitored.

In the model for overall job satisfaction in the CERS dataset, job autonomy as a variable is modelled via a variable in the category work organisation, variable which takes the value 1 if work is organised in such a way that individual performance can be differentiated from that of one’s peers (see *Work organisation*, Table 3.3). This variable has borderline significance and has a modest effect insofar as it increases the probability of a worker being completely or very satisfied by 4.7 percentage points. This is a less substantial effect on job satisfaction than has been found for the US.³⁰ In the models of satisfaction with pay, job autonomy is reflected in the worker’s influence over job tasks, the pace of work and how the job is done. In the CERS, only influence over the pace of work has a statistically significant effect on satisfaction with pay (Table 3.4), whereas in the WERS all three measures of work organisation are highly significant (Table 3.5). In general, workers with greater job autonomy are more

³⁰ See Nguyen, Taylor and Bradley (2003) who focus specifically on the relationship between job autonomy and job satisfaction in Britain. They find that the impact of job autonomy is highly statistically significant on all five aspects of job satisfaction: pay, fringe benefits, promotion prospects, job security and importance / challenge of work.

satisfied with their pay, and influence over the pace of work is amongst the larger of the effects. For instance, in the WERS, the marginal effects on this variable sum to approximately 0.06 for ‘very satisfied’/ ‘satisfied’. In contrast, the equivalent sum for influence over how the job is done is only 0.026, implying that workers are happier with their pay when they have more control over their level of effort.

A set of five variables relates to *employee involvement* or channels through which workers can *voice* their grievances or views (see Table 3.3). These employee involvement variables can be placed on a scale from the most passive form of involvement (information dissemination) to the most engaging form (management holds meetings with employees). This idea of an employee involvement ‘continuum’ from most passive to most engaging forms of involvement was initially proposed in the Freeman-Lazear model (Freeman and Lazear 1995), and has been tested by Addison *et al* (2000). However, many of these variables have an insignificant effect on job satisfaction in the model, the exception being ‘management holds meetings with employees’. The variable has a very strong effect in raising job satisfaction increasing the probability of a worker being completely or very satisfied by 15 percentage points. This finding may reflect a preference amongst workers for a simple and direct channel of face to face communication with management.

In the models of satisfaction with pay in Tables 3.4 and 3.5 the information dissemination variable is disaggregated, increasing in sophistication from ‘notice boards’ to ‘email or website’, whereas the same variables are used to reflect employee involvement. There is some evidence that workers are more satisfied with their pay the more technologically sophisticated the method of information dissemination used in

the firm. To see this, compare the negative effect on the notice board variable with the positive effect on the email and website variables. With respect to employee involvement, workers are more satisfied with their pay when they are able to meet and express their views to managers, and the magnitude of this effect is very similar in the CERS and the WERS (see Tables 3.4 and 3.5, *employee involvement / voice*).

The effect of involvement in negotiation regarding initial pay raises workers overall job satisfaction (Table 3.3, *recruitment & selection*) and, perhaps unsurprisingly their satisfaction with pay (Tables 3.4 and 3.5). What is interesting, however, is the finding that the effect of negotiation over initial pay is larger for overall satisfaction, increasing the probability of being completely or very satisfied by almost 6 percentage points, than it is for satisfaction with pay, where it increases this probability by 3 percentage points. This finding suggests that allowing workers to negotiate over initial pay has spillover effects insofar as workers are more satisfied with the job as a whole.

3.4.2. The effect of pay practices

Table 3.3 shows that seniority-based pay mechanisms, such as pay based on tenure, have a significant positive effect on job satisfaction. This is the traditional type of payment practice, designed to maximise effort from the firm's perspective while minimising risk for the worker. The probability of being 'completely' or 'very' satisfied is increased by 7 percentage points for workers in these firms. Interestingly, there is also a positive and statistically significant relationship between 'pay based on tenure' and satisfaction with pay in the CERS (Table 3.4) but not in the WERS (Table 3.5) possibly due to the differences between the datasets with regard to firm size, and, consequently, different availability of pay based on tenure.

The results for the CERS may come as a surprise to the advocates of the 'new' performance related pay practices, given the dramatic decline of seniority-based pay mechanisms (Ornatowski, 1998). However, there is contrary evidence from this analysis that workers are more satisfied with 'new' pay practices, especially when pay is related to individual performance. This type of compensation system links rewards to individual performance by comparing their achievement to the goals set at the beginning of the year. Thus, although individual, team and company performance-related pay practices have no statistically significant effect on overall job satisfaction (see *Performance-related pay*, Table 3.3), individual performance-related pay does increase workers' satisfaction with their pay in CERS. The effect is large and highly significant in CERS, and while the variables are not significant in WERS (compare Tables 3.4 and 3.5), the effect is nonetheless positive in both cases. Similarly, where

the firm operates a profit sharing or option scheme, worker satisfaction with pay is enhanced.

The observed link between individual performance-related pay and satisfaction with pay in CERS is consistent with the earlier findings here, in that workers prefer systems when work can be visually assessed and differentiated from co-workers. Why then is there no statistically significant relationship between performance-related pay and overall job satisfaction? The answer may simply be that workers agree with the principle of relating effort to rewards but suffer disutility from effort. Furthermore, creating a performance-pay link that is perceived as fair can be problematic, especially in the case of subjective performance appraisals where the appraisers may be suspected of giving biased judgements (Prendergast, 1999).

In keeping with the existing literature on the determinants of workers' job satisfaction, the model for overall job satisfaction includes a variable reflecting comparison income, albeit one based on the workers own perception of their relative pay. Table 3.3 shows that where workers perceive their own pay to be relatively low this reduces their overall job satisfaction. This is consistent with existing evidence (Nguyen *et al* 2003; Clark and Oswald 1994). In comparison to the estimated effects on many of the HRM variables, relative income has a much larger effect, reducing the probability of being 'completely' or 'very' satisfied by over 15 percentage points. Thus, although workers are more satisfied with their pay when it is related to tenure and/or a system of performance-related pay, the 'level' of pay or the additional reward reduces overall job satisfaction. The above shows evidence in favour of Hypothesis 2 related to the impact of pay practices on job satisfaction.

3.4.3. The effect of workplace pay inequality on job satisfaction

As suggested in the review of the literature there is very little evidence on the impact of the distribution of pay in the workplace on job satisfaction. Workers may be concerned about inequality in the workplace simply out of a sense of fairness or natural justice. Alternatively, a highly compressed pay distribution implies that there is little opportunity for advancement in the firm. There may also be a difference in attitude regarding workplace pay inequality between union members and non-members, the former being expected to be more egalitarian.

Table 3.3 shows that after controlling for an individual worker's perception of being low paid, a pay structure that is perceived to be over-dispersed is associated with lower levels of job satisfaction (see *Perceived workplace inequality*). These effects are substantial, especially in those firms where the 'pay gap is much too big', and bring evidence in support of Hypothesis 3. In these firms the probability of a worker being 'completely' or 'very' satisfied is reduced by 15 percentage points. The equivalent figure for firms where the 'pay gap is too big' is 12 percentage points. A highly dispersed wage structure may therefore alienate those workers at the lower end of the job-wage hierarchy because they feel under-valued. It is perhaps for this reason that Pfeffer and Langton (1993) have suggested that the best system of pay is one that is based on a mixture of seniority, productivity and credentials. This finding is replicated with respect to workers' satisfaction with pay in the CERS (see Table 3.4), whereas in WERS the only variable that could be included in analysis is 'Pay gap is small' (Table 3.5). The estimate for this variable is statistically insignificant.

If the distribution of pay is regarded as unequal and this reduces workers' job satisfaction, then the management needs to either change that distribution by altering its pay practices, or (if workers' judgement is based on a misperception of the pay distribution) improve information flows in the firm.

3.4.4. Union versus non-union differences in the impact of HRM practices

The role of unions within the workplace may have been replaced by the introduction of HRM practices, which have the potential to increase workers' job satisfaction and performance and hence offer competing services to those provided by unions. Although there is some debate about whether this substitution has in fact occurred - Machin and Wood (2004) reject the hypothesis of substitution having occurred - it is still possible that workers are more satisfied if they can voice their concerns, for instance, via one or more of the HRM practices rather than indirectly via a union.

Therefore, it is appropriate to assess union vs. non-union member differences in the effect of HRM practices on their job satisfaction. This is done via binomial and ordered probit models in Table 3.6 for overall job satisfaction and in Tables 3.7 and 3.8 for pay satisfaction. The method used is to interact union membership with the statistically significant HRM practices identified in the previous sections. For instance, the teamwork - union interaction variable, called the teamwork (union) variable, is generated via the multiplication of the variable for teamwork with the union dummy. Thus, the teamwork (union) variable takes the value 1 if teamwork *and* unionisation are present in an establishment; it takes the value and 0 otherwise, i.e.

if employees are non-union members (irrespective of whether the HRM practice “teamwork” is implemented), or if employees are union members but teamwork is not implemented. The coefficients for the union interaction variables show a differential for the unionised workers, i.e. an addition to the overall effect of a respective HRM practice within a unionised workplace implementing that respective HRM practice. Herein, this effect is called the differential union effect. The estimated union interaction models are otherwise identical to those in Tables 3.3 to 3.5, except for the inclusion of these interaction effects. Tables 3.6 and 3.7 report the interaction effects of perceived workplace pay inequality and union status for the CERS. Table 3.8 reports interaction effects in WERS.

A general finding in the case of non-union members is that the impact of HRM practices on job satisfaction remains significant on the set of HRM practices studied for union-interaction. This impact has the same sign as in previous analysis where union interaction was not taken into account. Consistency can also be noted between the size of the results on the overall workforce (Tables 3.3 – 3.5) and results obtained for non-unionised members and/ or employees where the HRM practice is not implemented (Table 3.6 – 3.8). A few notable exceptions, when the size of the effects on these latter employees are only slightly bigger than for the overall workforce, are in the case of relative income being perceived as low, which decreases overall job satisfaction by 18.8 pp but only by 15.6 pp for the overall workforce; and the perception of the pay gap being too big (10.3 pp reduction in pay satisfaction, compared to 8.7 pp for the overall workforce). However, the differential union effect for virtually all of the HRM practices the impact on job satisfaction is mostly insignificant,.

Most of the results from Table 3.6, with dependent variable overall job satisfaction, suggest mostly insignificant effects for union member interaction. However, in the two cases in this Table where marginal effects are significant, union members where the HRM practice is implemented (as opposed to non-union members and/or employees where the practice is not implemented) are less likely to be dissatisfied with respect to perceiving their own pay to be low, and to perceived high pay inequality in the firm. The probability of union members where the HRM practice is implemented, being ‘completely’ or ‘very satisfied’ is reduced by 9.2 percentage points when their perceived relative pay is too low, and by 10.5 percentage points when the pay gap in the workplace is perceived to be ‘too big’ (Table 3.6, *Perception of relative income and Perceived workplace inequality*). However, non-union members and/or employees where the HRM practice is not implemented appear to be more adversely affected: their job satisfaction decreases by 18.8 percentage points if perceived relative income is low, and by 15.7 percentage points if the pay gap is perceived as being ‘too big’.

Table 3.6 Union - non-union differences in the effect of HRM practices on overall job satisfaction (CERS) - Marginal Effects from binomial and ordered probit

VARIABLES	Binomial model		Ordinal model					
	P-values	Satisfied	P-values	Completely satisfied	Very satisfied	Satisfied	Neutral	Dissatisfied
<i>Work organisation</i>								
Teamwork	0.414	0.019	0.732	0.004	0.006	-0.004	-0.002	-0.003
Teamwork (unions)	0.701	0.014	0.066*	0.037	0.054	-0.045	-0.022	-0.024
<i>Supervision</i>								
Performance differentiated from others	0.015**	0.068	0.107	0.020	0.036	-0.024	-0.014	-0.018
Performance differentiated from others (unions)	0.438	-0.033	0.579	-0.011	-0.019	0.013	0.008	0.009
Employee can be seen all the time by supervisor or manager	0.053*	-0.044	0.125	-0.017	-0.028	0.020	0.011	0.013
Employee can be seen all the time by supervisor or manager (unions)	0.620	-0.020	0.301	-0.018	-0.033	0.022	0.013	0.016
Supervision of work progress	0.200	0.030	0.053*	0.022	0.037	-0.027	-0.015	-0.018
Supervision of work progress (unions)	0.764	-0.012	0.528	-0.012	-0.020	0.014	0.008	0.010
<i>Employee involvement / voice</i>								
Involvement in decision making via...								
...meetings where employees can express their views	0.014**	0.064	0.000***	0.051	0.098	-0.058	-0.040	-0.052
...meetings where employees can express their views (unions)	0.868	0.006	0.442	-0.015	-0.027	0.018	0.011	0.013
<i>Recruitment & selection</i>								
Initial pay is negotiable	0.071*	0.042	0.171	0.016	0.026	-0.020	-0.011	-0.012
Initial pay is negotiable (unions)	0.941	-0.003	0.308	0.025	0.036	-0.031	-0.015	-0.016
<i>Training & learning</i>								
Job requires ongoing learning	0.003***	0.093	0.000***	0.052	0.111	-0.054	-0.045	-0.063
Job requires ongoing learning (unions)	0.960	-0.002	0.993	0.000	0.000	0.000	0.000	0.000
<i>Seniority-based pay</i>								
Pay related to tenure	0.095*	0.037	0.025**	0.025	0.040	-0.030	-0.016	-0.019
Pay related to tenure (unions)	0.310	0.036	0.715	0.007	0.011	-0.008	-0.004	-0.005
<i>Perception of relative income</i>								
Own pay is relatively low	0.000***	-0.100	0.000***	-0.065	-0.123	0.072	0.050	0.066
Own pay is relatively low (unions)	0.871	-0.006	0.075*	0.039	0.053	-0.047	-0.022	-0.023
<i>Perceived workplace inequality</i>								
Pay gap is much too big	0.000***	-0.192	0.000***	-0.057	-0.118	0.062	0.048	0.066
Pay gap is much too big (unions)	0.157	0.054	0.162	0.036	0.049	-0.043	-0.020	-0.022
Pay gap is too big	0.000***	-0.145	0.000***	-0.054	-0.103	0.060	0.042	0.055
Pay gap is too big (unions)	0.060*	0.066	0.058*	0.045	0.060	-0.054	-0.024	-0.026

Binomial model: Sample size = 1,518; Log likelihood = -549.11; LR chi2(58) = 256.73

Ordinal model: Sample size = 1,518; Log likelihood = -1930.54; LR chi2(58) = 331.36

Note 1: "Satisfied" in the binomial model includes "Completely satisfied", "Very satisfied" and "Satisfied"

Note 2: "Dissatisfied" in the ordinal model includes "Dissatisfied", "Very dissatisfied" and "Completely dissatisfied"

Note 3: The significance level of the p-value is signalled using: *** for p<0.01, ** for p<0.05, and * for p<0.1

Note 4: The model also includes controls for age, gender, marital status, educational qualifications, occupation, contract type, firm size and sector. These results are available by request.

With respect to workers' satisfaction with pay in CERS (Table 3.7) there are no significant differential union effects . In contrast, for non-union members or employees where the practice is not implemented the probability of being 'completely' or 'very' satisfied is reduced by 11 percentage points where the pay gap is perceived to be 'much too big', compared to 9 percentage points where the gap is perceived to be 'too big'.

The findings with respect to perceived pay inequality, the differential union effect is interesting insofar as it suggests that although many HRM practices raise workers' job satisfaction, , there may be a downside. If HRM practices, especially those related to pay, create a more unequal distribution of pay within the firm, then workers' job satisfaction can be substantially reduced. Clearly, it is important to know whether this is sufficient to counter the positive effects of the HRM practices, and so whether pay inequality reduces worker performance and increases quit rates. Moreover, it is useful to assess whether the perception of workplace pay inequality is more important than actual workplace pay inequality. A case can be made for either variable, and it can be argued that worker perceptions are more relevant where there is imperfect information in the workplace, which is likely in larger firms.

Table 3.7 Union - non-union differences in the effect of HRM practices on satisfaction with pay (CERS) - Marginal Effects from binomial and ordered probit

VARIABLES	Binomial model		Ordinal model					
	P-values	Satisfied	P-values	Completely satisfied	Very satisfied	Satisfied	Neutral	Dissatisfied
<i>Employee involvement / voice</i>								
<i>Information dissemination via...</i>								
...notice boards	0.550	-0.024	0.055*	-0.007	-0.021	-0.033	0.011	0.050
...notice boards*union	0.967	-0.003	0.336	0.006	0.017	0.026	-0.010	-0.040
...newsletter or internal magazine	0.326	-0.040	0.055*	-0.008	-0.022	-0.034	0.012	0.052
...newsletter or internal magazine*union	0.950	-0.004	0.616	0.004	0.010	0.016	-0.005	-0.024
<i>Involvement in decision making via...</i>								
...meetings where employees can express their views	0.017**	0.098	0.001***	0.012	0.035	0.066	-0.018	-0.095
...meetings where employees can express their views*union	0.847	-0.013	0.331	-0.006	-0.018	-0.032	0.009	0.047
<i>Recruitment & selection</i>								
Initial pay is negotiable	0.012**	0.097	0.092*	0.007	0.018	0.028	-0.010	-0.043
Initial pay is negotiable*union	0.979	0.002	0.591	0.004	0.011	0.017	-0.006	-0.026
<i>Seniority-based pay</i>								
Pay related to tenure	0.013**	0.089	0.004***	0.010	0.028	0.044	-0.015	-0.067
Pay related to tenure*union	0.522	0.039	0.404	0.005	0.015	0.022	-0.008	-0.034
<i>Performance-related pay</i>								
based on individual performance	0.021**	0.102	0.006***	0.013	0.035	0.048	-0.020	-0.077
based on individual performance*unions	0.857	0.014	0.872	-0.001	-0.003	-0.005	0.002	0.008
Profit sharing/ option schemes	0.010**	0.132	0.010**	0.015	0.039	0.050	-0.022	-0.081
Profit sharing/ option schemes*union	0.565	-0.049	0.857	-0.001	-0.004	-0.007	0.002	0.010
<i>Perceived workplace inequality</i>								
Pay gap is much too big	0.000***	-0.379	0.000***	-0.026	-0.084	-0.211	0.028	0.293
Pay gap is much too big*union	0.294	0.074	0.562	0.004	0.012	0.018	-0.007	-0.028
Pay gap is too big	0.000***	-0.308	0.000***	-0.023	-0.070	-0.150	0.031	0.212
Pay gap is too big*union	0.166	0.091	0.340	0.007	0.019	0.027	-0.010	-0.042
<i>Job autonomy – influence over...</i>								
...pace of work	0.061*	0.085	0.015**	0.009	0.028	0.054	-0.014	-0.077
...pace of work*union	0.290	-0.074	0.321	-0.006	-0.019	-0.033	0.010	0.048

Binomial model: Sample size = 1,496; Log likelihood = -879.90; LR chi2(61) = 277.34

Ordinal model: Sample size = 1,496; Log likelihood = -1,835.13; LR chi2(61) = 306.79

Note 1: "Satisfied" in the binomial model includes "Completely satisfied", "Very satisfied" and "Satisfied"

Note 2: "Dissatisfied" in the ordinal model includes "Dissatisfied", "Very dissatisfied" and "Completely dissatisfied"

Note 3: The significance level of the p-value is signalled using: *** for p<0.01, ** for p<0.05, and * for p<0.1

Note 4: The model also includes controls for age, gender, marital status, educational qualifications, occupation, contract type, firm size and sector. These results are available by request.

Table 3.8: Union - non-union differences in the effect of HRM practices on satisfaction with pay (WERS) - Marginal Effects from binomial and ordered probit

VARIABLES	Binomial model		Ordinal model					
	P-values	Satisfied	P-values	Very satisfied	Satisfied	Neutral	Dissatisfied	Very Dissatisfied
<i>Supervision</i>								
Supervision of work progress	0.001***	0.043	0.010**	0.004	0.023	0.001	-0.015	-0.014
Supervision of work progress (unions)	0.651	-0.009	0.966	0.000	-0.001	0.000	0.000	0.000
<i>Employee involvement / voice</i>								
<i>Information dissemination via...</i>								
...notice boards	0.060*	-0.034	0.019**	-0.006	-0.029	-0.001	0.019	0.017
...notice boards (unions)	0.797	-0.009	0.545	0.003	0.014	0.001	-0.009	-0.008
...email or website	0.000***	0.039	0.000***	0.006	0.031	0.002	-0.020	-0.019
...email or website (unions)	0.113	0.026	0.131	0.003	0.017	0.001	-0.011	-0.010
<i>Involvement in decision making via...</i>								
...formal suggestion schemes	0.293	0.014	0.441	0.001	0.008	0.001	-0.005	-0.005
...formal suggestion schemes (unions)	0.999	0.000	0.384	0.002	0.012	0.001	-0.008	-0.007
...meetings where employees can express their views	0.000***	0.058	0.000***	0.008	0.051	0.006	-0.032	-0.034
...meetings where employees can express their views (unions)	0.348	-0.025	0.219	-0.004	-0.022	-0.002	0.014	0.013
<i>Recruitment & selection</i>								
Initial pay is negotiable	0.000***	0.150	0.000***	0.024	0.111	0.001	-0.074	-0.061
Initial pay is negotiable (unions)	0.001***	-0.050	0.005***	-0.005	-0.031	-0.003	0.020	0.020
<i>Training & learning</i>								
Both training and skill development are encouraged	0.000***	0.156	0.000***	0.026	0.129	0.004	-0.085	-0.075
Both training and skill development are encouraged (unions)	0.120	0.034	0.154	0.004	0.021	0.001	-0.014	-0.012
Either training or skill development is encouraged	0.000***	0.090	0.000***	0.014	0.074	0.004	-0.048	-0.043
Either training or skill development is encouraged (unions)	0.363	-0.018	0.371	-0.002	-0.012	-0.001	0.008	0.007
<i>Job autonomy – influence over...</i>								
...job tasks	0.000***	0.059	0.000***	0.009	0.055	0.005	-0.035	-0.035
...job tasks (unions)	0.049**	-0.034	0.022**	-0.005	-0.027	-0.002	0.017	0.017
...pace of work	0.003***	0.036	0.000***	0.006	0.036	0.003	-0.023	-0.023
...pace of work (unions)	0.007***	0.050	0.003***	0.007	0.037	0.002	-0.024	-0.022
...how job is done	0.006***	0.043	0.004***	0.005	0.030	0.003	-0.019	-0.019
...how job is done (unions)	0.415	-0.019	0.304	-0.003	-0.016	-0.001	0.010	0.010

Binomial model: Sample size = 19,890; Log pseudo-likelihood = -12054.586; Wald chi2(57) = 1369.75

Ordinal model: Sample size = 19,890; Log pseudo-likelihood = -27,300.80; LR chi2(57) = 1,975.98

Note 1: "Satisfied" in the binomial model includes "Very satisfied" and "Satisfied"

Note 2: The significance level of the p-value is signalled using: *** for p<0.01, ** for p<0.05, and * for p<0.1

Note 3: The model also includes controls for age, gender, marital status, educational qualifications, occupation, contract type, firm size and sector. These results are available by request.

In more detail, for satisfaction with pay, the sum of the marginal effects for the top two satisfaction categories ranges from 0.05 to 0.06. The differential union effect is insignificant in both the CERS and the WERS. In terms of skill development, it can be seen that where the job requires on-going learning (Table 3.6, *Training & learning*) or where both skill development and training are encouraged by the firm (Table 3.8 *Training & learning*), workers' overall job satisfaction and their satisfaction with pay is much higher for non-members. The sum of the marginal effects for the two highest categories of overall satisfaction is 0.16 and is 0.15, both large effects. In contrast, the equivalent differential union effect is not significantly different from zero. It is also worth noting the positive and statistically significant effects of the performance-related pay and the profit sharing variables in the CERS (Table 3.7). Both are around 5 percentage points.

One interpretation of these findings is that HRM practices perform similar functions for some of the non-union members as unions do for their members through bargaining over pay and working conditions. Just as unions are able to successfully negotiate over issues regarding pay and conditions of employment on behalf of workers, so HRM practices play an important role in raising satisfaction with pay for some non-union members.

To sum up, Hypothesis 4 related to union-interaction effects cannot be rejected due to the fact that a large number of p-values are insignificant – in all, only 4 practices have a differential union effect in the analysis from Tables 3.6 to 3.8.

3.5. Conclusions and summary

This chapter has investigated the effect of HRM practices on workers' overall job satisfaction and their satisfaction with pay. Two cross-section nationally representative surveys are used, enabling an analysis of these dependent variables, as well as of a large set of HRM practices. The classification of HRM practices deployed, as well as the nature of this study, aims to bridge the extant HRM literature (mainly based on case-studies) with the recent developing labour economics literature on job satisfaction.

The study of job satisfaction is rooted in the social sciences, where it has mainly been analysed from the point of view of intrinsic or extrinsic motivators, situational theory and in case studies in the HRM literature. Social scientists were interested in the impact of job satisfaction on individual well-being. As the study of job satisfaction developed into the economics literature, the focus became the link between job satisfaction and company / employee performance. Here, job satisfaction is broken down into facets. Recent empirical economics literature on job satisfaction deploys utility functions.

To cover the gaps in the literature and increase knowledge on the chosen topics of research, four hypotheses are formulated based on the extant literature: (1) certain HRM practices (training, job autonomy, teamworking, job design, employee involvement, communication) impact positively on job satisfaction; (2) methods of pay practices (seniority-based pay, option-share schemes individual performance schemes) are positively associated with job satisfaction; (3) a too high perceived pay inequality

has a negative impact on job satisfaction; and (4) workplace practices have a lower positive impact or even no impact on job satisfaction for union members, but they mediate the relationship between HRM practices and job satisfaction.

These four hypotheses are tested in econometrics models which control for a large number of personal, job and firm-related characteristics. The first hypothesis shows that the HRM practices introduced in models have a statistically significant, and in some cases substantial, effect on workers' overall job satisfaction and on their satisfaction with pay. Specifically, it is found that workers enjoy on-going learning, the impact on job satisfaction for this practice being the highest out of all other practices. This brings a much-needed contribution to the area of research concerning the link between training and job satisfaction, which has so far received surprisingly little attention. Job autonomy and working in teams also enter with positive impacts in the models on job satisfaction. Close supervision of work is disliked, but workers enjoy some visual assessment of their performance, suggesting that some monitoring is desirable. Furthermore, giving workers a 'voice' through employee involvement schemes has a positive effect on job satisfaction. Managers who hold regular meetings with employees to enable them to express their views about work have the most substantial effect in raising job satisfaction.

With regard to the second hypothesis, satisfaction with pay is higher where seniority-based pay, share option schemes or individual performance-related schemes are in place. With regard to the third hypothesis, a pay structure that is seen as too dispersed is associated with lower levels of job satisfaction. These effects are large and only apply to non-union members. It can be conjectured that, although HRM practices

have a direct positive effect in raising workers' job satisfaction, if these policies also raise pay inequality in the workplace then there may be an offsetting negative effect on satisfaction and performance. Finally, when investigating the differential union effects of HRM practices on the job satisfaction, results show that many of the positive effects hold only for some of the non-union members, which suggests that HRM practices are either a threat or an irrelevance to some union members.

This clearly raises implications for the design and implementation of HRM practices, particularly with respect to pay and incentive systems. However, it should be noted that the effect of perceived workplace pay inequality, rather than actual pay inequality (this data for actual pay inequality is harder to obtain), is measured and it may be that the distribution of pay is misperceived. The implication would then be that information flows about pay structure should be improved if managers are concerned with their workers' job satisfaction.

Further research avenues that could be explored include splitting the samples by gender or industry, or controlling for income.³¹ Due to the limitations in the CERS observations and the design of the WERS, this increased level of analysis was not feasible here.³²

³¹ Parent (1999) suggests that the influence of performance pay schemes differs by gender. Additionally, Clark (1997) notes that job satisfaction may also be gender-related.

³² For instance, pay is not recorded in WERS as a continuous variable but in banded levels. Additionally, there was no data related to worker specific measures of pay dispersion, but rather self-reported perceptions of organisational pay dispersion.

Summary for Chapter III

- Job satisfaction can be the motivating key to increasing company and employee performance. HRM practices have an impact on job satisfaction, but extant literature is not clear as to which those practices are.
- The contributions of this chapter are that it analyses:
 - the impact of HRM practices on job satisfaction. Via its choice of HRM practices, it aims to bridge the HRM literature with the Labour Economics literature – an original feature;
 - an unexpected find, namely that training has a very high impact on job satisfaction (the highest of all HRM practices in this chapter), contributes significantly to a previously under-researched area in the literature;
 - the impact of specific methods of pay on job satisfaction - adding to a small literature base;
 - the impact of perceived pay inequality on workers' job satisfaction - adding to a small literature base;
 - whether HRM practices have a different impact on the job satisfaction of union members;
 - employee-based data – adding to a small literature base of studies which take into account employees' point of view.
- The chapter combines and compares two nationally representative cross-section surveys in Britain, which complement each other: CERS 2000 with over 2,000 employee observations, and WERS 1998 (from which the panel for 1998 is also used) with over 19,000 employee observations.
- The hypotheses test the following sign of impact on job satisfaction: (1) certain HRM practices chosen based on the HRM literature (e.g. job autonomy, employee

involvement) - positive; (2) certain methods of pay (e.g. seniority pay) - positive; (3) perceiving the pay structure as highly dispersed – negative; and (4) HRM practices for union members – lower impact than for non-union members. The first three hypotheses are validated. There is not enough evidence to support the fourth hypothesis.

- The models generated to study the relationship between HRM practices and job satisfaction, include on the left-hand side job satisfaction as dependent variable, with overall job satisfaction in CERS-based model, or pay satisfaction in CERS and WERS-based models. On the right-hand side are worker, job and firm characteristics; and a classification of HRM practices based on HRM literature: i) work organisation, (ii) supervision, (iii) employee involvement, (iv) recruitment and selection, (v) training and learning, and (iv) pay practices, including perception of relative income and perception of pay inequality.

- The main findings are:

- consistency can be noted between the results obtained in all analyses run in this chapter with regard to the HRM practices that are significant, and the sign and the size of their impact on job satisfaction;

- a significant contribution is made by this chapter to the literature on training and job satisfaction, which has so far received very little attention. The HRM practice with the single biggest positive impact on overall and pay satisfaction is ‘encouraging on-going learning’. In fact, supporting both training and learning can lead to increases by 16 percentage points in job satisfaction;

- employee involvement, pay negotiation and job autonomy have a significant positive impact on job satisfaction. Close supervision of work is disliked, but workers enjoy some visual assessment of their performance, suggesting that some monitoring is desirable;

- a perception of relative pay as being too small, and a perception of pay dispersion in the company as being too high, have the biggest negative impact on job satisfaction, with the size of effects being around 15 pp. It is important to know whether this may counteract the positive effects of HRM practices. Further research, based on more informative data, could try to identify the overall net effect of HRM practices when the perception of relative pay (ideally, alongside data on the actual pay distribution) are also accounted for;
- more research is needed to know whether perception of pay inequality may have an even more substantial impact than actual workplace inequality; this study could only measure the former;
- satisfaction with pay is higher where seniority-based pay, share option schemes or individual performance-related schemes are in place;
- the differential union effects show the least satisfaction with respect to perceived pay inequality and relative income;
- one interpretation of the differential union-effects findings is that HRM practices perform similar functions for some of the non-union members as unions do for their members through bargaining over pay and working conditions. Just as unions are able to successfully negotiate over issues regarding pay and conditions of employment on behalf of workers, so HRM practices play an important role in raising satisfaction with pay for some non-union members.
- Some of the limitations of the research undergone in this chapter relate to: both datasets presenting cross-sectional data and not panel data; number of observations in CERS not allowing a more in depth analysis (e.g. data split by industry); and the incidence of some HRM practices in WERS being only judged at workplace and not at individual employee level.

CHAPTER IV
THE IMPACT OF HRM PRACTICES ON EMPLOYEE WORK EFFORT
IN BRITAIN

4.1. Introduction

This chapter investigates the impact of HRM practices on work effort, reporting separately both employees' and managers' perspective in Britain. The main focus of this study is on whether and to what extent Human Resource Management (HRM) practices impact on measures of employee and managerial-reported work effort. An in-depth look into the meaning, conceptualisation, theory and literature on effort is intended to contribute to these areas which have previously received little attention. Then the chapter questions whether HRM practices are associated with increases in workplace effort. The data used is the British Workplace Employment Relations Survey 1998 (WERS 98) which contains over 19,000 employer-employee matched observations. An attempt is also made to classify HRM practices according to a chronological development from traditional to more modern.

The originality of this approach lies in presenting both the views of the manager and the employee, thus presenting the employees' usually less seen perspective on organisational issues. Data from management and individual employees is based on self-reported comparisons between the effort at present and effort at some previous point in time. The two measures of effort are essentially reconstructing the same object of analysis within the same workplace (since data is employer-employee

matched) and differences between manager's and employee's evaluation of effort could then be put down to the sensitivity of their perception.

Most of the extant literature on effort takes the relatively easier task of analysing quantitative measures of so called 'extensive' effort, defined as the answer to "how much work has been done". It is mainly the recent labour economics literature that, like this chapter, takes the challenge of studying intensive effort, reflected by the concentration and degree of intensity of work, and the answer to "how hard the employees have been working". Moreover, subjective constructs of effort are deployed, a feature which places the present study at the avant-garde of labour economics development.

Another novel feature is that the conceptualisation of effort borrows from both HRM and Labour Economics literature. On the one hand, the study aims to determine whether HRM practices lead to effort being increased by creating workplace settings which encourage employees to deploy more effort. This is rather in the vein of the HRM literature where HRM practices are implemented in order to motivate and enable human resources to reach their maximum potential in the workplace. The assumption is that HRM practices can make employees like their jobs due to the implementation of the said practices. The approach is linked to the previous chapter in this thesis, on job satisfaction. Chapter III is a chapter built around the hypothesis that certain HRM practices have a positive impact on job satisfaction. By the same token, here, HRM practices are tested to investigate whether they can lead to employees willing to deploy effort at their own discretion.

The chapter is structured as follows. Section 4.2 contributes to the study of effort by offering an insight into the theoretical frameworks of research used on this topic and the extant economic and management literature on effort. Section 4.3 describes the data used, the hypotheses formulated for this study, the variables generated and the econometric models built. Section 4.4 discusses the results and Section 4.5 presents the conclusions followed by a chapter summary.

4.2. Theory and literature review on workplace effort

This section assesses the impact of HRM practices on workplace effort, by looking succinctly at the theoretical and empirical contributions from the economic and management literatures. It starts with an assessment of the meaning and conceptualisation of effort, followed by whether effort is to be maximised or minimised, and by whom. Then, it presents the relevant theoretical frameworks which underpin the hypotheses for this chapter. In the end, a literature review separates the extant studies on effort into distinct strands, depending on the HRM practice or factor analysed. This section aims to contribute significantly to the study on workplace effort which lacks a consistent and clear framework of research.

4.2.1. What is workplace effort?

Researching workplace effort is a complex task which needs to start with an assessment of the multiple meanings in use. However, there is widespread use of the term 'effort', with little reference to its definition and without consensus on the usage and meaning of the term. Few studies attempt to make a distinction between effort and

related concepts of performance, productivity, efficiency, motivation, commitment. In spite of a substantial amount of research resources deployed with the aim of understanding the “high-performance” workplace, it is quite surprising to notice this lack of clarity and consistency in the literature when it comes to utilising the terms above. The amount of confusion that this leads to cannot be overestimated.

Amongst the most notable attempts to pin down a shared sense of meaning, Guest (1990) mentions a definition given by Baldamus, who defines effort as 'the sum total of physical and mental exertion, tedium, fatigue or any other disagreeable aspect of work' (Guest 1990: 29). However, researchers are also warned: 'as it contains many subjective elements, this component [effort] defies rigorous definition and is certainly unmeasurable' (Guest 1990 : 30). In a more fruitful search for a definition, Andrews and Simmons (1995) conclude that the list of interpretations is 'endless' and adopt the definition: 'anything that is bargained over in real-world negotiations, apart from employment and wages, and is not paid directly' (Andrews and Simmons 1995 : 315). In their paper, effort becomes rather synonymous to 'working conditions'.

The notion that sits at the heart of the analysis of effort in this chapter is captured by the term 'discretionary' effort. It is used to refer to effort deployed beyond the strictly needed or contracted amount of effort, as Bailey (2000) establishes in a substantial chapter. Batt (2004) likens discretionary effort to the 'goodwill' of the employee' (Batt 2004 : 118). Berg and Kalleberg (2002) maintain that 'organizing the work process so that non-managerial employees have the opportunity to contribute discretionary effort is the central feature of a high performance work system (HPWS)' (Berg and Kalleberg 2002 : 3).

As perceived from the difficulty of finding a definition, the conceptualisation of effort is problematic and research interests differ. Attempts to clarify or standardise methods of measurement are not yet common either. So, a brief discussion of the conceptual ways of thinking about effort is needed.

Most notably, differences appear along the line of qualitative versus quantitative expressions of effort: qualitative measures take into account work intensity, while quantitative measures tend to take into account hours of work. The point of departure and most substantial element which helps in this discussion is the distinction between extensive and intensive effort which can be made in analysing effort.³³ Extensive effort refers to a quantitative measure of effort, for instance related to the length of working day and quantified by working hours. It refers to how much work has been done. This can be separated from intensive effort, reflected by the concentration and degree of intensity of work tasks within a given amount of time, and which acquires a qualitative notion that is more problematic to measure. It refers to how hard people work.

Most of the extant literature on effort takes the relatively easier task of analysing quantitative measures of extensive effort. The microeconomic studies predominantly assess topics related to working hours and overtime, life-work balance, time-off arrangements, leisure, family friendly policies, flexible working arrangements. The macroeconomics literature looks at the impact of employment legislation on

³³ Green (2001 : 56 - 57) and Guest (1990 : 303 - 305) present a more in-depth discussion on the conceptualisation of effort. Guest (1990) offers a survey of the psychological and sociological literature, which distinguishes between work effort (seen as the actual deployment of work, with no further quantification) and work intensity (merely the speed and concentration of work).

labour supply, labour participation and unemployment, or distribution of working hours within the population.

It is mainly the recent labour economics literature that, like this chapter, takes the challenge of studying intensive effort. Hereby, this chapter attempts to research effort by analysing combined data from management and individual employees based on self-reported comparisons between the effort at present and effort at some previous point in time. Since these comparisons are usually relative to a common experience of work intensity, such as within the same establishment, they can be considered valid for the purpose of the analysis. In other words, since both the employer and manager refer in their estimation of effort to their experience in the same workplace, their reports and perception of effort can be used in relation to each other as they are reflections of one and the same picture.

The validity of a combined measure of effort should also hold even if the type of measures used by the employer happens to be different than those used by the employee, for instance if one gives a level-measure (e.g. effort is high) while the other gives a process-measure (effort has increased) – the basis of their assumptions is the same workplace. The two measures of effort are essentially reconstructing the same object of analysis, and differences between manager's and employee's evaluation of effort could then be put down to the sensitivity of their perception.

A particular case of reconstructing effort from the manager's and employee's perceptions is when the former rates overall workplace effort, while the employee rates individual effort. In these cases, there could be observations where the

two measures differ not only due to differences in perception, but also due to differences in information. For instance, the manager of the workplace may believe that overall workplace effort has increased, while individual employees may confess to shirking. The principle of extracting a combined measure of effort remains the same, as the two ratings are the two sides of the same coin, namely the same workplace. The additional advantage of this particular case is that it creates an invaluable opportunity to peer inside the organisation, especially with regard to those observations where the management's view is *different* than that of the employees. This type of analysis is an original feature of the chapter.

When it comes to the relatively harder task of analysing and measuring *intensive* effort, the most trodden path in the literature has been to quantify the degree of change in work intensity (e.g. Green 2001). Green (2004) is the closest and only study to date that looks at effort intensity and its determinants. This chapter advances Green (2004) in the following ways. Firstly, it brings together the employees and management views. Secondly, it focuses on a much wider array of workplace practices. Thirdly, it proposes a test of the historical development of HRM practices directed at employee effort, via taking a multidisciplinary approach and allowing the high-commitment managerial literature and other social sciences to inform its choice of independent variables. Lastly, and maybe most importantly, it attempts to shape a unified framework for research on effort seen as a desirable workplace consequence of a prolific environment at work, unlike Green's (2004) view of effort as undesirable work intensity.

4.2.2. Is effort to be maximised or minimised? By whom?

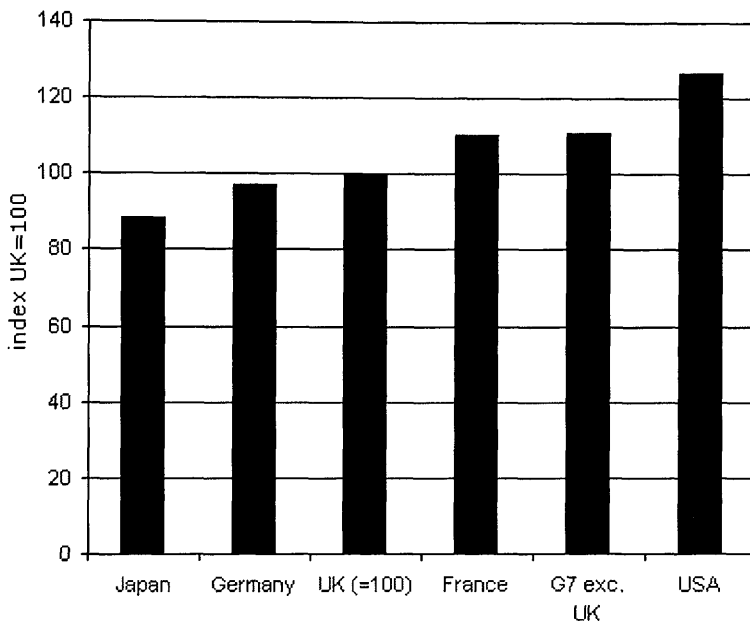
Most of this literature on effort at work regards effort as an undesirable factor especially for the employee.³⁴ This study takes a potential contentious stance on effort by asserting it as a desirable outcome for both the employer and, more distinctively different than the literature, for the employee. The following substantiates and explains this contentious issue. Some of the most evident perspectives of the literature on effort in use can be summarised and classified into the following five categories:

(1) *Productivity perspective*: The main view taken by classical economics is that employers aim to maximize profits and minimize costs. To increase output per employee, in order to maximise the returns to work or increase productivity, more output from fewer employees or fewer work hours is needed. In this context of analysing productivity, 'effort' is the factor appearing in the denominator part of the output/input ratio, so it is to be minimised if productivity is to be maximised.³⁵ For instance, in the context of growing competition in the market place, British workplaces have been continuously scrutinised and compared against their counterparts. Measures featured in comparisons, such as GPD per hour (see Figure 4.1) or economic growth, look at extensive comparisons of productivity per employee, not taking into account the quality of work nor the more complex issues related to the sociology of work (e.g. are employees satisfied with their workplace? are levels of well-being high?)

³⁴ For a detailed view of the literature, please see the latter parts of this section.

³⁵ If productivity is defined as the ratio of output divided by input, and input is the multiplication result of hours x effort per employee x employees, then for productivity to be maximized, effort should be minimised. This perspective also makes a limiting assumption that effort is constant across employees with the same skill levels.

Figure 4.1 International comparisons of productivity based on GDP per worker, (2005)



Source: Office of National Statistics

(2) *Employee exploitation perspective:* This literature on labour is written based on the assumption that employees have to be aware that their behaviour could be manipulated, and that they could try to be more in control of their jobs in order to avoid (unfair) working pressure imposed by employers. Here, the rationale for minimising effort is that employees are being exploited at work. 'Effort' is seen as the result of a manipulative or coercive exercise, so the fact that employers want more 'effort' from employees is given a bad, alienating and self-interested connotation. The topics of research revolve around questioning the fairness, means and sources of exploitation of the employee by the employer. Studies assess the factors that are conducive to the intensification of effort (e.g. Edwards and Whitston 1991, Green 2001, Strobl and Walsh 2002, Green 2004). Similar to the first perspective, the employees are expected

to aim to minimise effort; unlike the first perspective, the employers are assumed to be intent on maximizing effort.

(3) *Work as a disutility, and the Agency Theory perspective*: Work is presented as a disutility for employees because they may gain a higher utility from another activity such as leisure. Thus employees intend to avoid or minimise effort, so as to gain their work compensation for less work. Employees may shirk, so monitoring is needed (this is the essence of the Agency Theory), which is costly for the employers. However, some monitoring is unavoidably needed to make sure that the work does get done. In this perspective, the employees cannot be trusted to deploy effort unless they are closely managed and controlled. Employers aim to maximise effort while minimising monitoring costs.

(4) *Personnel Economics perspective* (linked to employee disutility): Employers demand effort which has disutility for employees. Similar to the third perspective above, employers consider it desirable that employees deploy effort. However, here the view is that instead of the 'stick' approach via monitoring, the 'carrot' approach is used by employers: employees are to be compensated for the 'effort' they put in. At its most basic, the compensation includes one pecuniary measure, the wage, paid for both time at work (extensive margin) and effort while at work (intensive margin). More developments in compensation packages have shown that effort can be influenced by various pecuniary incentive schemes e.g. deferred pay, performance-related pay or seniority pay. The ways in which effort can be influenced by various pecuniary or non-pecuniary compensation schemes have been the subject matter of Personnel Economics over the last 15 years.

(5) *The HRM perspective*: Here the focus is on motivating the employee to deploy effort via HRM practices. This perspective shares with Agency Theory and Personnel Economics perspectives the interest in increasing employee effort. Unlike the previous perspectives, the novel approach here is the assumption that employees can be motivated so as to desire to deploy *more* effort out of their own accord. It is hypothesised that if the right workplace conditions are put in place, the employees would be satisfied, happy and willing to deploy effort in an environment where their own interests are aligned with the organisational interests.

The HRM literature speaks of motivating employees via constructs remote from traditional economists' understanding, such as achieving an alignment between employees' values and organisational values; organisational culture; organisational mission. However, it is from this perspective that some non-pecuniary HRM practices have been derived, such as workplace flexibility, job security or job autonomy.

There are reasons to believe that this perspective can be witnessed to have materialised in organisations. For instance Blanchflower and Oswald (1999) conduct an international study of satisfaction and stress levels at work, and note that 'First, the great majority of workers in the industrial democracies appear to be remarkably content with their jobs. The old Dickensian idea that work subjugates people is apparently not supported by the data' (Blanchflower and Oswald 1999 : 1).

Notably, the critical change that can be observed among the five perspectives exposed above is in the way they conceptualise 'effort' with regard to whether more or less effort is desired, and whether it is desired by the employer or by the employee. Initially, 'effort' is as an entity to be minimised by both employer and employees. Then, the emphasis shifts on ways in which employers can maximise effort

despite its undesirable characteristics to the employee. According to different perspectives, these ways range from exploitative (via lack of control over one's job), to distrustful (via monitoring) and towards compensatory (via pecuniary or non-pecuniary benefits). Lastly, the HRM literature, which is built on celebrating and enhancing the potential of the employees as valued human resources, puts emphasis on ways in which the (ideally) matched objective of both employees and employers is to maximise effort.

Therefore the connotation given to effort in this chapter is a positive one. The assumption is that in an efficient organisational environment, characterised by the presence of the 'right' combination of HRM practices - the determination of which forms the core of this study – employees would 'naturally' be more productive. They would use their skills, abilities and knowledge to better effect, ultimately working harder and willingly deploying more effort. In this vein, it would be counterintuitive to argue that having employees declare 'my job requires that I work very hard', and having managers note substantial upwards changes in 'how hard people work here', are not desirable and worthwhile objectives – and these are precisely the measures of effort used in this analysis.

4.2.3. Theoretical insight into the study of work effort

In an attempt to shed more light on the theoretical underpinning for researching the topic of effort in the workplace, this review of the theoretical literature includes both economic and HRM developments. On the one hand, there are various phases in the development of economic theoretical frameworks which could be used to attempt to understand effort. On the other hand, in terms of HRM developments, effort is seen from the perspective of an assumed and empirically investigated impact of management practices on worker and organisational behaviour.

Starting with a presentation of economic theoretical frameworks relevant to work effort, these vary from competitive to non-competitive models, from macro to micro economic assumptions, and from the objectivism of the Adam Smith's 'invisible-hand' of market forces to allowing for institutional or behavioural influences. A brief review of these frameworks necessarily has at its base the purely theoretical assumption of market forces under perfect competition and neoclassical economics. Relaxing some of the traditional assumptions leads to a variety of models such as: compensating differentials, wage competition models, tournament theory, principal-agent models, human capital theory, efficiency wages models, internal labour markets and job competition models. Some of these models have an added benefit when compared to neoclassical economics, in that they recognise the role of institutional forces, and even assume away the restriction to a competitive labour market.

The most basic neoclassical theory relates to effort via postulating that work effort be seen as part of the traditional production function. In its simplest and widely cited form, a production function is limited to two inputs, respectively capital and labour:

$$Q = F(K, L) \quad (1)$$

where Q is output (e.g. quantity of units produced), K is capital input and L is labour input. Labour could also be expressed as a product of hours of work H and N number of workers, giving:

$$Q = F(K, HN) \quad (2)$$

Under these basic traditional production function assumptions, the function Q is assumed to be single-valued, continuous and at least twice differentiable with marginal products being positive and decreasing, giving $Q'_K > 0$, $Q'_L > 0$, $Q''_K < 0$ and $Q''_L < 0$.

A widely used explicit form for the production function is the Cobb-Douglas production function:

$$Q = a K^\alpha L^\beta \quad (3)$$

where Q , K and L have the same meaning as in (1); a is a constant; and α and β are the elasticities of capital and, respectively, labour with respect to output.

The attractiveness of a Cobb-Douglas mathematical formulation comes from it allowing an easy estimation of returns to scale, for instance the case of constant returns to scale is obtained if $\alpha + \beta = 1$. Neoclassical economics models are then built assuming perfect competition i.e. prices of output, capital and labour are predetermined. A principal theoretical preoccupation in this type of model is determining the combinations of labour and capital which insure the minimisation of costs, or maximisation of profits. Or, in practice, a firm's demand for labour comes under wider influences such as the price of labour, production techniques and technology, and the labour market environment.

There are known limitations to neoclassical models of the labour market, and to their interpretation of effort. Understandably, there are inherent difficulties posed by neoclassical models above, and they are associated with aggregating different varieties and quantities of labour and capital into only two inputs. The aggregation issue can only be solved in the case of one worker and one machine. Or, theoretically, these inputs are assumed to be homogenous. Crucially too, labour is only modelled from a quantitative-based perspective (e.g. number of hours worked, speed of work, number of tasks performed), without considering the qualitative aspects of labour effort (e.g. work energy, commitment, care, attention to detail).

Evidence from labour economics studies suggests indeed that neoclassical theory is hampered by limitations in ascertaining the level of work effort needed and the factors likely to influence it. For instance, it cannot explain why the market may not clear even in the long-run, an observation attributed to markets compensating the non-wage job attributes. According to Hyclak *et al* (2005) : 171, the idea of wage

compensating differentials is traceable as far back as to the work of Adam Smith. In an empirical study, Fairris (2004) notes that in unionised markets, market forces may not lead to equilibrium in the labour market, since unions impact on wages. Therefore, applications of neoclassical economics have introduced the notion of compensating differentials: higher wages given in return for accepting to carry on hard, risky or unpleasant jobs. Indeed, Fairris (2004) finds that wage compensating differentials, mostly related to health and safety, tend to be present in unionised workplaces, whilst nonunionised workplaces have no such compensating differentials.

Positive steps in the conceptualisation of effort are made in models where the analysis takes into account the employee's perspective on behaviour. Though effort E is still conventionally measured in rather quantitative terms – as opposed to incorporating qualitative terms - such as efficiency units of labour, the standard production function can be re-written as:

$$Q = F(K, EN) \quad (4)$$

giving at the level of an individual employee, the utility function:

$$U = F(W, E) \quad (5)$$

where W is wage. Here the assumption is that effort impacts negatively on utility, so U is assumed to be strictly concave with $U_E < 0$, $U_{WW} < 0$, $U_{EE} < 0$, $U_{EE} - U_{WE}^2 > 0$, and $U_W > 0$. Workers have increased satisfaction from minimising levels of effort with regard to maximising rewards. The right balance has to be found with regard to amount

and intensity of effort, since too little effort leaves workers bored, whilst too much effort leads to stress. On employees' side, the deployment of effort depends on the price of and reward of effort, worker preferences and their abilities (skills, knowledge, resources). The advantage of this model is creating a framework which takes into account that the employee's individual characteristics and behavioural preferences influence the amount of effort deployed.

Wage competition models further the theoretical developments of the traditional economic models. While remaining within a traditional economic perspective, they use supply and demand curves and postulate that an equilibrium point will be reached when supply and demand for work effort meet in the labour market. Workers sell effort and firms buy it. Employers are competing for the highest quality and intensity of effort at the lowest wage, while employees bargain to obtain the highest wage for a minimum of effort. At the right level of wage, equilibrium is assumed to be reached, whereby sellers and buyers of labour are satisfied that their needs have been met in the market. The advantage of this theoretical perspective over previous models is that it takes into account the employees' side of the bargain, additionally suggesting a negative-utility connotation to effort similar to the utility function model described above.

Additionally, tournament theory (see Lazear and Rosen 1981) is also formulated on the hypothesis that effort is to be encouraged via competition. In contrast to wage competition models designed for the macroeconomic level, this model has had higher applications at the microeconomic level. The main assertion is that hard working individuals compete for 'prizes' inside the company. If employees are

homogenous, the theory predicts that total amount of effort exerted would be highest. Sunde (2003) tests this theory in the context of tennis players and finds that if tournament participants are heterogeneous there is lower effort exertion during the tournament, but that incentives set in the form of prizes matter for effort exertion. Tournament theory puts firmly into perspective the importance of analysing the impact of employee incentives when trying to understand the factors influencing workplace effort.

A well-established approach to studying work effort has been to assess the interaction between effort and the probability of being caught shirking. This economic theoretical framework is proposed by principal-agent models (Hart and Holmstrom 1986, Jensen and Meckling 1976). According to this model, the manager (the principal) tries to minimise the cost and amount of the monitoring and supervision which are needed in order to gain satisfying evidence on whether the employee (the agent) deploys enough effort on the job or shirks. The assumption is that effort would *not* be maximised in the absence of supervision and monitoring, and that effort is not easily observed other than via supervision and monitoring.³⁶ As opposed to motivation through rewards and incentives (e.g. in the tournament model), this approach looks at practices related to employee monitoring, discipline and control under the assumption that employees would not have an intrinsic desire to work at the peak of their performance if they were given complete autonomy.

However, merely deterring people from shirking goes a very short distance towards motivating employees to work at their best. In fact, those employees who only

³⁶ Different forms of technology and different occupations will require different HRM systems for supervision and monitoring. The first hypothesis analysed in this chapter attempts to look at these differences.

work because of the fear of being caught shirking, could not be expected to be one and the same as those who would deploy discretionary effort. In other words, practices which would attempt to merely deter shirkers by intense monitoring, could stifle the creativity of employees who would otherwise have the freedom to show initiative at work. Being considered relevant for ways in which workplace effort is elicited, this theoretical view is partially analysed in this chapter in a model that assesses the efficacy of alternative HRM practices of supervision and quality monitoring.

Within the 1960s humanist movement which maintains a focus on the employee in the workplace, Becker's (1964) human capital theory postulates that a positive link between labour productivity and worker's skill, education, work experience and training should be expected. Effort is assumed to be higher in companies that invest in human capital, have a trained workforce and encourage skill development, while lower levels of pay may then be explained by lower quality of labour inputs. This theoretical framework has been influential in the way effort is modelled in the literature and in this chapter, in that employee education and training are controlled for.

Theoretical models of effort-wage relationships that set out to maximise effort include efficiency wages (for a theoretical description see Akerlof and Yellen 1986 – this model was popular in the 1970s and 1980s) which postulates that offering a wage above the market going rate allows a company to recruit and maintain a better quality of hard working employees.³⁷ It is assumed that workers respond to higher levels of pay by increasing their levels of effort, yet some authors show that pecuniary

³⁷ Efficiency wages models were used by authors including: Ramaswamy and Rowthorn 1991, Drago and Heywood 1992, Martin 1997, Fehr and Gächter 1998, Hinks 1999, Golsmith *et al* 2000, Strobl and Walsh 2002, Alexopoulos 2003, Strand 2003, Brown *et al* 2004, Fehr and Gotte 2004.

incentives alone can only go so far in motivating employees.³⁸ Similar to principal agent models, in efficiency wage models effort cannot be fully observed. The distinction is that efficiency wage theories see effort as a gift-exchange model, which has different implications than agency theory for views on the impact on HRM practices on effort. This chapter cannot test the efficiency wage theory, due to lack of distinctive employee-wage observations (wage is banded in WERS) as well as due to using a cross-sectional database. However, its implication is that pecuniary incentives increase employee effort in a direct relationship. This is tested in the way the model of effort is constructed, namely by assessing the impact of a large selection of pecuniary incentives on subjective constructs of effort.

Alternative theoretical views to neoclassical economics have been put forward in an attempt to capture the reality that market forces may not be the only factors that determine labour levels or work intensity in a purely “open” market model. These include internal labour market models, job competition models, dual labour markets and market segmentation.³⁹ These models depart from the neoclassical equilibrium theory of demand and supply meeting in the market and generating an equilibrium wage where the market clears. Instead, they attempt to underpin the ways in which wage adjusting mechanisms work in a non-competitive setting, so they assume the existence of institutional forces at play in addition to market forces.

Internal-labour markets assume that the allocation of workers to jobs and their wage setting is achieved mainly based on administrative rules within the firm,

³⁸ In response to higher wages, Fehr and Gotte (2004) find that in a model of incumbents who are loss-averse and reference-dependent, preferences can account for both the increase in working time and the decrease in daily effort.

³⁹ For internal labour markets, see Doeringer and Piore (1971).

even though the outside-firm wage is still important as there is always the latent threat to quit. Consequently, workers are more likely to have long-term employment whereby they get accustomed to the organisational culture, to develop specific knowledge via on-the-job training (especially in blue collar jobs), and to be promoted according to an internal promotion ladder with lower-level jobs being the only entry-point for workers from outside the firm.

Institutionalists suggest that discrimination or market segmentation (based on unionisation, culture or social status) are also important factors. Job competition models assume that individual characteristics and especially the cost of training are the basis of people being allocated a place in a job queue, from which employers pick those workers who need the least amount of on-the-job training.⁴⁰

Turning to the HRM literature, it has to be noted that it has as its central purpose the development of the human resource from the management's productive perspective. Employee morale, motivation and commitment are central themes of most modern research. HRM theories emphasise the importance of generating an organisational climate with a committed, loyal and motivated workforce, which identifies with the organisational culture and works hard. The assumption is that HRM practices can increase work performance if they persuade employees to 'identify' with the values of their organisation.

For instance, in the management literature, the most relevant debate to the topic of workplace effort has been put forward by theorising the views on employee

⁴⁰ For job competition models, see Thurow (1975).

behaviour which underpin managerial practice. McGregor's (1960) theories X and Y, as well as Ouchi (1981)'s theory Z differing essentially in the assumptions made for intrinsic employee behaviour. These much popularised views assume that employees are homogenous in their predicted behaviour towards labour, but that specific managerial practice can trigger the desired high-effort behaviour. More explicitly, if employees are expected to inherently dislike work, then management practices have to be of the type that constrict and pressurise employees into doing it (Theory X). Alternatively, if this 'lazy-employee' assumption is relaxed towards the view that employees may like work, since it fulfils psychological needs and could bring satisfaction (Theory Y), management practices would be attempting to offer job variation and autonomy.

In the more advanced view applied in Japanese management, Theory Z implies that employees increase effort in response to well-being programmes. Therefore, management could obtain high workplace effort if certain loyalty-inducing practices were in place, such as: long-term employment; individual responsibility; collective decision-making; implicit and informal control; explicit and formalized performance measures; appropriate evaluation and promotion; moderately specialized careers; and a holistic concern for employee well-being including the employees' family. Theory Z comes closest to the spirit of this chapter, in that it attempts to identify sets of management practices which lead to higher employee effort. However, its limitations are its national-applicability and time relevance. With regard to the former, Ouchi (1981) designed it with the aim of forming the best mix of practices in the American and Japanese companies, not British as is the aim of this chapter. With regard to its age, theory Z was put together more than two decades ago.

The main drawback of the HRM theories is that corporate performance appears to maintain a central role in analysis, and that the employee-issues should deserve more attention - Guest (2002) also notes this issue. In contrast, this chapter highlights the importance of not only bringing in the employee's side of the story, but of finding a way of bridging the employee's and manager's perspective in one common measure of effort.

To conclude, the theoretical frameworks presented above trace the evolution of thought with regard to conceptualising models of employee behaviour. They construct a mosaic of assumptions with regard to factors that impact on workplace effort. This chapter adopts the perspective that effort is to be maximised, as a desirable and natural by-product of a contented workforce.

4.2.4. A review of the literature on effort

Research on the topic of work effort (with this exact denomination) has been a recurrent but not clearly discernible theme in the Economics, Human Resource Management (HRM) and wider managerial and social science literatures. These literatures have developed frames of reference for the analysis of effort, but with rather divergent concerns.

One purpose of analysing effort in the economics and HRM literature is to identify ways of obtaining a productive workplace, while the interest in ways to increase effort *per se*, by getting to the roots of individual behaviour, becomes secondary. On the contrary, psychologists and sociologists have a manifested interest

in understanding behaviour *per se*; still, direct references to work effort via applying the knowledge of these disciplines to the workplace tend to take second place.⁴¹ Thus, this chapter aims to fill the gap in the literature by using the econometrics apparatus to understand the underlying factors that lead to individuals deploying effort at work, pushing the boundaries of extant studies.

While theoretical assumptions adopted in the extant literature vary, the common denominator in the empirical research on effort is to look at the impact of organisational factors on effort. A few main strands can be identified in a review of the literature, hence the studies presented below are grouped accordingly. The literature review starts with the assessment of pecuniary incentives, continues with ways of organising work and methods of communication, and finishes with studies on firm performance that come somewhat closer to the topic of research in this chapter.

Traditionally economists have studied effort, mainly under the denomination of productivity. The majority of the empirical studies in this literature focus on pecuniary incentives in their most basic form, i.e. wages (e.g. Haskel and Martin 1996, Fehr and Götte 2004, Lopez-Tamayo and Surinach 2005, Millea and Fuess 2005). The majority of this literature analyses the relation between work effort and the role of pecuniary incentives in soliciting more effort. Millea and Fuess (2005) conduct a 50-year study of the manufacturing sector in the US and find that there could be a bi-directional relationship between pay and productivity, with pay acting both as an anterior incentive and posterior reward to effort.

⁴¹ Studies approaching the study of effort from an attitudinal or even psychological perspective include: Clark (1999), Brown (2001), Bowles *et al* (2001), Dubinsky and Skinner (2002), Fisher (2002), Minkler (2002), Bartel *et al* (2003), Fershtman *et al* (2003), Goette and Huffman (2004), Bandiera *et al* (2005).

Advances in the pecuniary incentive literature in relation to work productivity involved analysing forms of contingent pay (such as piece rates, seniority pay, group or individual performance-related pay) and forms of financial participation (gain sharing).

On contingent pay, Bandiera *et al* (2005) find in a British case study that piece rates (which are a form of absolute incentives) can solicit at least 50% higher productivity of an average employee when compared to relative incentives, an example of the latter being that a worker's pay depends on how she performs relative to her peers. This study takes into account the effect of social preferences on methods of pay, which is why its conclusions differ from the studies that traditionally extolled the benefit of relative pay (e.g. Lazear and Rosen 1981). Other studies, in line with the general literature, find that piece rates may raise productivity but may lower profitability, while time rates have the opposite effects (e.g. Freeman and Kleiner 2005). Additionally, a large literature analyses the impact of pay for performance on effort, with various results (Lazear 1996, Heery 1998, Booth and McCulloch 1999, Lazear 2000, Frick and Prinz 2003, Marsden 2004). As noted by Marsden (2004) it may be that the role of pay for performance in increasing productivity is mainly to act as a trigger for renegotiating performance norms (for instance, via goal-setting and appraisal procedures) than to be a motivator for effort. The impact of skill-based pay on effort also seems to be mediated by social factors such as the perception of fairness, which are higher when these pay schemes provide training and are better understood and communicated (Lee *at al* 1999 presenting an American case study).

Still on the topic of pecuniary remuneration, a large variety exists amongst the schemes of financial participation analysed in relation to their impact on productivity or effort. Such schemes include gain sharing (Blanchflower and Oswald 1988, Pendleton 1997, Kim 1999, Heywood *et al* 2003, or Freeman *et al* 2004) or stock options and employee ownership (Bai and Xu 1996, Pendleton 1997, Leadbeater 1997, Pendleton 2001, Freeman *et al* 2004). Such studies also find mixed answers to the question of how employee participation schemes impact on effort. For instance, Pendleton's (2001) study on WERS 98 in Britain finds little support for the traditional theoretical arguments regarding the impact of profit sharing and other forms of participation on employee behaviour. Instead, Pendleton's (2001) findings are more in line with the industrial relations literature and supportive of the notion of 'bundling', suggesting that 'the relationship between "traditional" forms of employee representation and more innovative human resource management practices may be complementary rather than zero-sum' (Pendleton 2001 : 116).

A more recent trend in the economic analysis of pecuniary incentives and effort has been to look at the impact of relative pay (via analysing comparison income, pay inequality and pay dispersion) as well as at the pecuniary side of fringe benefits (such as commission, bonus, pension schemes, health insurance or parental leave).⁴² Bloom (1999) suggests that a more compressed within-firm pay distribution is positively associated with individual and organisational performance. However, in the area of Sports Economics, Gardner (1999) finds that pay for performance discourages increased effort due to creating a very wide pay dispersion, whilst Knowles *et al*

⁴² Studies on income, pay inequality and pay dispersion include Layard (1980), Akerlof and Yellen (1990), Ramaswamy and Rowthorn (1991), Pfeffer and Langton (1993), Clark and Oswald (1996), Moene and Wallerstein (1997), Bloom (1999), Winter-Ebmer and Zweimuller (1999), Brown (2001), Kugler (2002), Shaw *et al* (2002), Grund and Sliwka (2003), Frick and Prinz (2003), Beaumont and Harris (2003), Maureen (2004).

(2003) report that not having pay linked to performance is also conducive to demotivated players.

This literature finds that attitudinal variables, in particular perceptions of fairness play a crucial role in mediating the impact of dispersed-pay schemes and effort. For instance, Maureen (2004) finds that labour supply falls for the average male employee in response to lower fairness perceptions in less egalitarian distributions of pay. With respect to fringe benefits, a literature specifically targeting individual bonuses is yet to be developed. A case study on performance related pay mechanisms by Engellandt and Riphahn (2004) find that effort is higher if performance evaluations are more heterogeneous and individual “surprise” bonus payments are used more frequently.

Another strand in the literature looks at the impact of work organisation on effort. The themes under investigation include the traditional economics view that companies try to achieve a balance in the organisation of work between the cost of supervision (acting as deterrent to shirking behaviour) and employee job autonomy.⁴³ More recent advances in this literature suggest that the empirical relevance of the principal-agent theory (see Eisenhardt 1989), postulating companies may increase effort under tight but low cost monitoring, could be increased by taking into account the role of the psychological contract between principals and agents. As such, increased monitoring may be interpreted by employees as managerial distrust, leading to reduced work effort.⁴⁴ In other words, too much monitoring can be

⁴³ For more details on the usage of this traditional economics view, see Weaver (1977), Frey (1993), Osterman (1994), Belfield and Marsden (2002) or Freeman *et al* (2004).

⁴⁴ Two studies that address specifically the issue of trust in the workplace are Frey (1993) and Kalleberg *et al* (2004).

counterproductive, stifling creativity, putting boundaries to innovation, and jeopardising work efficiency.

Alternative ways of monitoring, initially perceived as less invasive, stem from organising work in teams and using peer pressure to influence the quality and quantity of work effort.⁴⁵ On the one hand, the impact of teams on labour productivity appears to be positive (Banker *et al* 1996), especially in the case of self-managed teams (see Batt 2004) or if associated with unions (McNabb and Whitfield 1997) where teams can reverse the otherwise negative impact of unions. On the other hand, some authors raise suspicion regarding the actual amount of autonomy given to the employee in teams (Geary and Dobbins 2001) or point to the negative consequences of a pervasive peer scrutiny on work motivation. Kandel and Lazear (1992) suggest that peer pressure can mean that effort is greater in large firms than in small ones, possibly due to worker sorting or to free riding being more likely to occur in larger firms.

A related literature on the analysis of the ways of organising work looks at the effects of empowerment, flattened hierarchies and flexible workplace practices on effort. Flexibility is seen as an important factor in counteracting the potential negative impact of unionisation on labour productivity (McNabb and Whitfield 1997), and a large literature on work-life balance (WLB) and work sharing issues shows that there are large benefits to be gained from implementing flexible working hours and working-from-home policies, along with risks of employee stress and burnout in the case of

⁴⁵ For studies analysing the impact of teams and team briefing on effort, see: Kandel and Lazear (1993), Banker *et al* (1994), McNabb and Whitfield (1997), Geary and Dobbins (2002), Harley (2001), Ichniowski and Show (2002), Frick and Prinz (2003), Batt (2004), Deery and Iverson (2005).

poor company management of time and objectives.^{46 47 48 49} A caveat mentioned by MacInnes (2005) is that it cannot be assumed by default that work-life balance policies are in the interest of workers with families, since family members may need more income and hence be willing to work more working hours. Indeed, Pannenberg's (2005) West Germany study presents a compelling argument in favour of working long hours (even if unpaid), as it suggests that over a 10-year period of working unpaid overtime, real labour earnings can increase on average by at least 10 percentage points above the earnings of their co-workers.

The relationship between type of contract and effort has also been analysed, with evidence to show that temporary contracts may lead to one working more overtime than if hired on a permanent contract (Engellandt and Riphahn 2005) and confirming the popular view that temporary contracts are less desirable due to lower levels of job satisfaction, receiving less training and lower pay (Booth *et al* 2002).⁵⁰ Fixed-term employment is found to be a stepping-stone for women (Booth *et al* 2002), and there does not appear to be a difference in how hard people work if

⁴⁶ For studies on work sharing issues see: Andrews and Simmons (2001), Bell and Freeman (2001), Budd and Mumford (2001), Campbell and Green (2002) Gray (2002), Felstead *et al* (2002), Oswald (2002), White *et al* (2003), Barnard *et al* (2004), Berg *et al* (2004), Boheim and Taylor (2004), Goette and Huffman (2004), Andrews *et al* (2005), Pannenberg (2005), MacInnes (2005).

⁴⁷ For benefits of implementing flexible working hours and working from-home policies, see for instance White *et al* (2003) who find that flexible hours systems and personal discretion over starting and finishing times tend to reduce the negative job-to-home spillover. However, certain 'high performance' practices are associated with negative job-to-home spillovers (i.e. 'the imposition of the public sphere on the private' White *et al* 2003: 191) and these practices are found to be: appraisal systems, group-based forms of work organisation and individual incentives.

⁴⁸ For studies on work pressure, stress and the analysis of effort intensification, see Green (2001), Strobl and Walsh (2002), Berg and Kalleberg (2002), Hamermesh and Lee (2003), Green (2004), Gallie (2005)

⁴⁹ For a study on employees suffering from overworking, Campbell and Green (2002) use the British Household Panel Survey between 1991-1996 to show that their long-term returns of working long hours become negative beyond 47 hours for women and 59 hours for men. They suggest that increasing UK wage inequality may have had an upward impact on work hours, because the incentives to work longer hours were greater for women than for men.

⁵⁰ For studies on the relationship between type of contract and effort, see Carmichael (1999), Higgins *et al* (2000), King (2000), Booth *et al* (2002), Felstead *et al* (2004), Green (2004), Purcell *et al* (2004), Engellandt and Riphahn (2005), Forder and Slater (2005).

employed on a fixed-term as opposed to permanent contract (Green 2004). However, Green (2004) concludes that there appears to be 'a small association between the decision to deploy more nonstandard workers and the intensification of work' (Green 2004 : 731).

In a different strand of the literature, communication and consultation have been analysed in relation to organisational performance and effort (Muchinski 1977, Snell 1991, Peccei *et al* 2003).⁵¹ With varying degrees of information disclosure by management, it appears that the positive effects of communication are lower if unions are strong, but that the effects 'vary depending on the level of employee organisational commitment, type of information disclosed and performance outcome involved' (Peccei *et al* 2003). Soliciting information from employees, employee involvement in decision making and problem solving appear to lead to additional benefits for employees and to make the workplace more productive (Zwick 2004), though there is controversy over this issue (Freeman and Kleiner 2000).

The role of information and knowledge dissemination and consultation, closely related to practices that stimulate training and learning, as factors of production that lead to increases in effort and work efficiency is highlighted in studies such as Hull(2000), Martin (2003) Cassidy *et al* (2005) or Fung (2005).⁵² In particular, the positive role of technological change and information and communication technology in the knowledge economy is assessed in Hamermesh and Oster (1998), Hunter and

⁵¹ For studies on employee participation and involvement, see Addison *et al* (2000), Freeman and Kleiner (2000), Delbridge and Whitfield (2001), Felstead and Gallie (2004) or Zwick (2004).

⁵² Studies that show the positive effects of encouraging training and the acquisition of skills on organisational performance are: Black and Lynch 1998) Heyes and Stuart (1998), Burke and Baldwin (1999), Whitflid (2000), Green *et al* (2003), Conti (2005). In particular, two studies analyse the impact of achieving the status of Investors in People on organisational performance : Grugulis and Bevitt (2002) and Hoque (2003).

Lafkas (1999), Cappelli and Carter (2000), Black and Lynch (2001), Bradley (2002), Atrostic and Nguyen (2005), Hempell (2005), Ilmakunnas and Maliranta (2005), Matteucci *et al* (2005).

Another closely related branch of the communication-and-consultation literature is constituted by studies that accentuate the importance for work productivity of maintaining a grievance-free workplace and good management-employee relations (e.g. Edwards and Whitston 1991, Edwards 1995, Gazioglu and Tansel 2002, Deery and Iverson 2005). A step in researching the above literature is to focus on the influence of unions on firm performance and related organisational outcomes.⁵³, ⁵⁴ This has been a wide issue of interest especially with the advent of high-involvement HRM practices. More modern HRM practices, targeting individual or group commitment, involvement and financial participation, were hypothesised to displace unions or other forms of representation and collective voice. However, Machin and Wood (2004) and Poole *et al* (2005) find limited evidence that HRM practices have replaced union bargaining. They conclude that an increased incidence in HRM practices is not conducive to, and is not paralleled by, a decline in the number of unionised workplaces. Moreover, Machin and Wood (2004), using two waves of the WERS series, find that the incidence of HRM practices is similar in union and non-union workplaces, irrespective of their age. Hence, some studies related to unionisation

⁵³ For some main studies assessing the impact of unions on firm performance, see Freeman and Medoff (1984), Nolan and Marginson (1990), Machin and Stewart (1990), Metcalf (1993), Machin and Stewart (1996), McNabb and Whitfield (1997), Booth and McCulloch (1999), Moreton (1999), Addison and Belfield (2002), Hirsch (2004), Bryson *et al* (2005).

⁵⁴ For the literature assessing the impact of unions on other organisational outcomes, such as level of pay, pay distribution, absenteeism or quit rates, see Arthur (1992), Andrews and Simmons (1995), Fernie and Metcalf (1995), Green and McIntosh (1998), Booth and McCulloch (1999), Cappellari *et al* (1999), Deery *et al* (1999), Charlwood *et al* (2000), Knight and Latreille (2000), Deery *et al* (2001), Bryson *et al* (2003).

and collective bargaining seem to imply that these are not factors which mediate the impact of HRM practices on workplace effort.

As a final literature strand highlighted here, in most of the recent labour economics studies work effort can only be said to have been tangentially analysed, namely to the extent that effort can be equated to firm performance. Therefore, it is to this limited extent that studies questioning the impact of HRM workplace practices or HRM systems labelled "high involvement", "high commitment" or "high performance" on firm performance can be considered implicitly relevant to the discussion of effort (examples include Arthur 1994, Huselid 1995, MacDuffie 1995, Koch and McGrath 1996, Youndt *et al* 1996, Huselid *et al* 1997, Addison 2005 or Bryson *et al* 2005). It is this literature that also proposed that studies of the impact of HRM practices on performance may benefit from analysing 'bundles' of practices, and not HRM practices in isolation.⁵⁵

To conclude this subsection, a few notable limitations of the literature are that most of the workplace studies relate to the US, and that there is an over-reliance on addressing particular industries, especially those involved in manufacturing. Despite a burgeoning multidisciplinary literature analysing the impact of high-performance practices on company performance, the picture coming from research on effort in Britain remains fragmented, unclear, under-researched and hence in need of further study.

⁵⁵ See Jackson and Schuler (1995), MacDuffie (1995) Milgrom and Roberts (1995), Pérotin and Robinson (2000), Ahmad and Schroeder (2003), Ichniowski and Shaw (2003), Laursen and Foss (2003).

Finally, the main drawback of the relevant extant literature is the lack of a unified premise for researching work effort. Instead of converging towards a coherent approach in the independent variables tested, factors that determine work effort tend to be unrelated and the choice of variables does not portray an established direction of research. To this purpose, this chapter attempts to combine the approaches suggested previously, by analysing the impact of sets of HRM practices on effort and relying on both economics and HRM perspectives. The logic for choosing the set of HRM practices used relies on the strands of the literature revealed above. For instance, in response to the literature on flexibility at work, a clear set of HRM practices related to workplace flexibility is introduced in the analysis. It is hoped that this approach goes some way towards solving the 'shopping-list' dilemma encountered by researchers when confronted by multidisciplinary and seemingly unrelated determinants of work effort. The economic literature also lacks studies at the individual employee level. However, labour economics has recently made several attempts to get inside the notorious 'black-box', and this study takes this challenge one step further in exploring individual levels of effort intensity.

4.3. Data, hypotheses and econometric estimations

4.3.1. Data and hypotheses

In order to examine the impact of workplace practices on work effort, stress and overtime, the data used in this chapter comes from the Workplace Employment Relations Survey 1998 (WERS 98) and the cross-sectional survey is used. British workplaces were sampled randomly from the official Inter-Departmental Register (of 1997), with the stratification of the sampling frame established by workplace size and industry sector. In relation to the former, this survey covers all workplaces in Great Britain employing 10 or more employees. In relation to the latter, all industry sectors are covered except agriculture, fishing and deep coal mining. The size of the final sample was of 2,191 workplaces, as a result of a response rate of 80.3 per cent.

The survey was conducted using structured questionnaires that were administered for each workplace to a managerial respondent, an employee representative and, for the first time in 1998, to employees. The managerial respondent is defined in WERS to be “the senior manager dealing with personnel, staff or employee relations”. Hence, to this extent of uncertainty regarding the location of the manager in relation to the workplace for which she is responsible, it should be acknowledged that the manager who is interviewed may be at a certain organisational distance (for instance, on a different site) from the employee respondent interviewed in the workplace. Nevertheless, the common ground between the employee and the manager is still formed by the employment relationship context of the same workplace.

If the workplace size was under 25, the employee questionnaires were distributed to all employees in the workplace. Otherwise, a maximum of 25 employees were sampled from each workplace. Appendices C.1 and C.2 offer a more detailed look at the composition of the sample according to the number of respondents per workplace. This chapter uses 28,215 respondents in employment, of age between 16 and 65, of which 51% are female.

The WERS 98 cross-section covers three elements: (1) the management of the personnel function, via face-to-face structured interview and self-completion 'Employee Profile' data sheet; (2) industrial relations issues such as representative structures, via face-to-face structured interview with the most senior representative of the largest recognized union at the workplace; and (3) employees' perspectives on the job, via a self-completion questionnaire. Of these, the management and the employee questionnaires are used in this chapter in order to analyse effort based on the separate views of the employee and the manager.

The fundamental question asked in this chapter is: are workers motivated to exert effort through management practices, and if so, how? The tested hypotheses propose that workers are motivated by groups of management practices such as pecuniary incentives, communication, training, or supervision and monitoring. In relation to the theoretical frameworks and the literature reviewed so far, three hypotheses are formulated in this chapter, as follows.

Based on principal-agent economic theory, it is hypothesised that effort can be increased through better monitoring that deters shirkers. Certain systems of

monitoring may be more efficient, and analysis is conducted to ascertain which quality and supervision monitoring practices are efficient in soliciting work effort.

Hypothesis 1: HRM practices related to supervision and quality monitoring have a positive impact on effort: the higher their incidence, the higher the employee effort.

For Hypothesis 2, the source of inspiration is in particular the study conducted by Ichniowski *et al* (1997) where 4 systems of HRM practices were identified, ranging from the more traditional to the most advanced. The main limitation of this study is that it was only conducted in the steel industry. Therefore, this chapter attempts to find whether HRM practices can be grouped in systems across industries, and whether some of these systems can be said to be more advanced and to have a higher impact on effort.

The first part of the hypothesis is also based on the studies from the literature review that emphasise the likelihood that certain HRM practices are complementing each other within the same organisational setting. It is expected that the analysis of HRM practices incidence reveals a pattern of HRM practices grouped into clusters.

At the same time, for the second part of the hypothesis, a large number of practices from multiple areas of management are hypothesised to impact on effort, such as pecuniary incentives, training or non-pecuniary incentives. This is in accordance with theoretical frameworks of study presented in the previous subsection, including effort as an argument within a production and a utility function, tournament

theory, human capital theory or efficiency wages. Institutional economics also informs the decision to include as wide a variety of practices as allowed by the dataset, in the hope of not missing out any practices which could impact on effort.

Moreover, still for the second part of this hypothesis, this study makes an attempt to classify HRM practices in groups and to test their impact on effort. This is in accordance with the distinct branches of the literature emphasised in the literature review. Besides the Ichniowski *et al* (1997) arrangement of HRM practices in a scale from traditional to advanced HRM practices, this attempt is heavily influenced by Bailey (2000). In the latter study, a historical perspective over the chronological development of work reforms is outlined. It evolves from human relations, to group relations, to systems models of horizontal fit, and ends with modern-day high performance workplace systems and technological environments. Based on Bailey (2000), it is expected that a positive trend in the evolution of workplace modern HRM practices has taken place, in that more modern practices would be associated with higher performance and workplace effort.

Therefore, this chapter advances a conceptual framework for the study of work effort based on a chronological development of HRM practices along six types, starting with the earliest incentives used in order to motivate work effort: (1) pecuniary incentives mainly wages; (2) work organisation and supervision practices; (3) communication and consultation practices; (4) pecuniary incentives other than wages; (5) non-pecuniary incentives; and (6) training.⁵⁶ The hypothetical HRM practices

⁵⁶ For more information, see this list presented in Figure 4.8, and the corresponding enlarged framework with all the HRM practices used in this chapter categorised by type in Appendix C.3

framework is tested in this chapter by classifying the HRM practices available in the dataset used for this chapter within the six types.

Hypothesis 2 a: Certain groups of HRM practices increase workplace effort: complementarities exist.

Hypothesis 2 b: Progress is hypothesised to have taken place in HRM: relatively more modern groups of HRM practices (e.g. workplace flexibility or job autonomy) are expected to have a higher impact on effort than relatively more traditional practices (e.g. rewarding effort via pecuniary incentives).

4.3.2. Presentation of the dependent variables

Two dependent variables are used in this study. The first attempts to measure effort as reported by the employee, and the second attempts to measure effort as reported by the manager. .

The dependent variable for the level of employee effort is encoded from a self-reported measure of individual employee effort. The information is collected for each of the 28,125 employees. The variable is constructed using the answers to the question asked of the employee: ‘Do you agree, or disagree, with the following statements about your job?’, one of the statements being that ‘my job requires that I work very hard’. Table 4.1 shows the distribution of employees according to their perception of the level of individual effort their jobs make them deploy in the workplace. Just over a quarter of respondents (29%) strongly agree with this statement,

and almost half (49.6) agree with this statement. The ordinal variable generated takes the value 2 for the former case, 1 for the latter case, and 0 otherwise.

This particular way of collapsing the original 5 scale variable was chosen in order to allow for observing the impact of HRM practices on two different levels of positive answers, namely “strongly agree” as differentiated from “agree”. Therefore, an ordered probit, rather than a binomial probit is implemented in this chapter, in order to take advantage of the large amount of answers in the categories “strongly agree” (28%) and “agree” (50). If a binomial dependent variable were used, the differences between these two categories would have been lost.

The shortcoming of this variable is that, given the nature of this question, it appears that the employee has no discretion or choice regarding whether to exert effort. This is because the questionnaire statement in WERS 98 relates to the demands of the job rather than the level of effort chosen by the employee.

Table 4.1. The employee’s perception of the level of individual effort

Question: ‘Do you agree, or disagree, with the following statements about your job?’.
Statement: ‘my job requires that I work very hard’

Answer	Frequency	Percent	Value of the dependent variable
Strongly agree	7,842	28.27	2
Agree	13,756	49.60	1
Neither agree nor disagree, Disagree, or Strongly disagree	6,137	22.13	0
Total	27,735	100	

Note: 1.71 percent (or 480) of respondents did not answer the question or answered ‘I don’t know’.

The dependent variable for the change in the overall workplace effort is encoded from a self-reported measure of overall workplace effort. The information is collected from each manager, with one manager interviewed for each establishment survey. Then, the information is allocated to each of the employees surveyed who worked with the respective manager. This is a simple procedure of attaching an observation equal to the observation reported by their manager, to each and all of the employees surveyed within an establishment. For instance, if the information obtained from the manager of establishment X is that ‘overall workplace effort has gone up a lot in establishment X’, this entry is attributed and inputted to each and all of the entries corresponding to the employees interviewed from organisation X.

The dependent variable is constructed using the answers to the question asked of the manager: ‘for each item [of the check-list] tell me if there has been any change at this workplace compared with five years ago, and how substantial that change has been, using the categories on this card’, one of the items on the card being ‘change in how hard people work here’. After allocating the answers of the manager to the employees working beneath each respective manager, the dependent variable showed that: in the case of 44% of the 28,125 employees, their manager believed that workplace effort has ‘gone up a lot’; for 38 % of respondents their manager believed that workplace effort ‘gone up a little’; and for the remainder of the employees, their manager believed that workplace effort either stayed the same, has gone down a little or has gone down a lot. Table 4.2 shows the distribution of employees according to their manager’s perception of change in the effort at their workplace. The ordinal variable generated takes the value 2 for the first case, 1 for the second case, and 0 for the remainder. The rationale for choosing this particular way of encoding the data, that

is conducive to an ordinal rather than a binomial probit, is the same as in the case of the dependent variable for employee effort explained above. By keeping a 3-level scale as opposed to a binary dependent variable, differences between effort going up “a little” (38%) and “a lot” (44%) can be distinguished.

Table 4.2 The manager’s perception of the change in workplace effort

Question: ‘tell me if there has been any change at this workplace compared with five years ago, and how substantial that change has been’ with regard to ‘how hard people work here’

Answer	Frequency	Percent	Value of the dependent variable
Work effort has gone up a lot	11,134	44.26	2
Work effort has gone up a little	9,472	37.65	1
Work effort has stayed the same, Work effort has gone down a little or a lot, or Work effort has gone up a lot	4,549	18.09	0
Total	25,155	100	

Note: 0.6 percent (or 166) of respondents did not answer the question or answered ‘I don’t know’.

In short, the two dependent variables represent an individual level effort measure as reported by the employee, and a change in the level of workplace effort measure as reported by the manager. The two complement each other, being the two faces of the same coin: assessment of effort within the same establishment. The unique advantage of this original approach of analysing both dependent variables is that it allows the researcher to spot, pin-point and target the factors that lead to discrepancies in the reported measures of effort.

With regard to the independent variables, Appendix C.3 shows the variable labels, type and means for the independent variables used in this study, while Appendix C.4 does the same for the control variables, namely the employee, job and firm characteristics. It has to be observed that there is a hidden wealth of information

contained in Appendix C.3 in what concerns the differences between aspects of the workplace where both the employee and the manager have provided answers – with these differences being at the heart of the analysis conducted in this chapter.

Whenever the dataset allowed it, two variables measuring a workplace aspect from the employee's, and respectively the manager's perspective, were created as similar as possible in order to allow for comparisons.⁵⁷ This means that certain limited degrees of comparisons could be made, using the means and the standard deviations of the variables in Appendix C.3. For instance, only 54% of employees report that they have job autonomy, whereas 62% of managers consider that their employees have job control.

4.3.3. Econometric methodology

Following the empirical and theoretical literature presented above, effort, $E_{i \text{ (or } w)}$, which can be regressed as either a measure of employee effort E_i (and respectively a measure of workplace effort E_w), is :

$$E_{i \text{ (or } w)} = \beta'_1 \mathbf{X}_{ij \text{ (or } jw)} + \beta'_2 \mathbf{HRM}_{ij \text{ (or } jw)} + u_{i \text{ (or } w)} \quad (6)$$

where \mathbf{X} refers to a vector of worker (i) and job (j) characteristics and workplace characteristics (w); \mathbf{HRM} refers to a vector of HRM practices; and u is the error term.

⁵⁷ Unfortunately, the dataset did not allow this in the majority of cases, since the WERS employee questionnaire, comprising of only 6 pages, is still much less developed than the questionnaire distributed to the management respondent which has 113 pages in length.

In this study, worker characteristics include their age, ethnic background, gender, marital status, number of children, highest educational qualification, union membership and tenure. It is hoped that by including in the model controls for individual tenure, occupation and highest educational qualification, the model also controls for worker ability and sorting, guarding at least to some extent against endogeneity. Job characteristics consist of occupational level and type of job contract. Firm characteristics include the firm size, sector, industry, and a dummy taking the value 1 if the workplace is “in the production sector” (this sector is defined in WERS 98 as “manufacturing, or electricity, gas or water supply, or construction”).

This chapter uses order probit models, run with the option of clustering by workplace. The methodology related to ordered probit methods has been explained in Chapter III on job satisfaction and is not replicated here. With the exception of one model which uses factor analysis to identify systems of HRM, this chapter reports coefficients, p-values and marginal effects from ordered probit models. Being a relatively basic methodology, factor analysis is also not detailed in this methodology section.⁵⁸

Advancing the previous literature on work effort, and especially Bailey (2000), a vector of HRM variables is included in the analysis, as presented in Table 4.3. The assertion made in the literature and tested here is that more modern practices which are higher up in the hierarchy (e.g. group 5: non-pecuniary incentives) would have a higher impact on effort than more traditional practices (e.g. group 2: work organisation)

⁵⁸ Please see Stata user guides available online for a succinct view over the purpose of this methodology which is mainly to indicate the way in which a set of variables can be grouped in subsets of a stable configuration while avoiding collinearity issues.

Table 4.3 Taxonomy of HRM practices: 6 groups

Groups of HRM practices	Subgroups and examples of HRM practices
1. Pecuniary incentives	wage
2. Work organisation	- workplace organisation (e.g. team objectives, company strategic plan) - supervision (e.g. quality monitored via inspectors or customer surveys)
3. Communication and consultation	- communication (e.g. keeping everyone up to date with changes, using meetings to share information) - consultation (e.g. not making any changes unless consulting with employees)
4. Pecuniary incentives other than wage	pay varies according to skill, or pay equality
5. Non-pecuniary incentives	- flexibility (e.g. working at home available, job control) - job security (e.g. guaranteed job security) - more recent organisational policies (e.g. company car, private health insurance, other 'perks')
6. Training	training paid by the employer

In order to test *Hypothesis 1*, namely that more supervision leads to more effort, ordered probit models for two distinct types of supervision are run with the dependent variables related to effort (Tables 4.6 and 4.7). Table 4.6 focuses on the supervision question asked of the manager regarding 'ways of making employees aware of their job responsibilities' – 'ways' which could be considered as proxies for HRM practices regarding supervision. Table 4.7 reports on ways of supervising workplace activity.

In order to test *Hypothesis 2*, namely that clusters of HRM practices tend to appear as the incidence of HRM practices is observed, and that more modern practices have a higher impact on effort than traditional ones, three models (Tables 4.8 - 4.10) are constructed.

In Table 4.8 an ordered probit model uses the dependent variables related to effort to test the impact of 3 systems of HRM practices on effort. The 3 systems are obtained via observing inter-group correlations during factor analysis. After analysing correlation indices between all HRM practices available in the dataset, and combining this information with the incidence of practices in organisations, satisfying statistical consistency was obtained for the three systems described in Table 4.4 with regard to the respective practices being complementary.⁵⁹

Table 4.4 Distribution of firms according to the incidence of three HRM systems

HRM practice	HRM System 1	HRM System 2	HRM System 3
Training	present	present	not present
Consultation	present	present	not present
PRP	present	(either present or not)	not present
Job Control	present	(either present or not)	(either present or not)
Percentage of firms in sample	17%	25%	58%

In Tables 4.9 and 4.10, the employee respectively the manager reported effort dependent variables are used in ordered probit models to assess the impact of a large array of HRM practices. In each of the two tables (Table 4.9 and 4.10), the HRM practices are based only on the questions asked of the employee (when the effort measure is employee-reported) and of the manager (when the effort measure is manager-reported). Additionally, the HRM practices are introduced in the model following the hypothesised development in HRM, according to Table 4.3. Due to the fact that wage would be endogenous in the models with effort as dependent variable, as well as due to the fact that pay levels are not recorded as a continuous variable in

⁵⁹ The details of this procedure are available from the author. Due to their substantial length, they are not presented here.

WERS98, pecuniary incentives such as the wage are not present in either models. Both of the models start instead with group 2 of HRM practices from Table 4.3, that is work organisation

All models are estimated with data being split firstly between the private (65% of observations, or 18,409) and the public sector (35% of observations or 9,806 employees), and secondly (within each sector) between professional (including professional, associated and managerial occupations) and non-professional occupations, with observations shown in Table 4.5 below.

Table 4.5 Levels of data split (Percentage of total sample within each category)

	Private sector	Public sector	Total (rows)
Professional occupations	5,980 22%	4,488 16%	10,468 38%
Non-professional occupations	11,991 44%	5,059 18%	17,050 62%
Total (columns)	17,971 66%	9,547 34%	Total: 27,518 100%

4.4. Results

Results are shown in Tables 4.6 – 4.10 which report marginal effects from ordered probit models. Models are all run with the five levels of data, split respectively for: (1) the entire sample; (2) professional employees in the private sector; (3) non-professional employees in the private sector; (4) professional employees in the public sector; and (5) non-professional employees in the public sector.

4.4.1. The effect of supervision HRM practices on effort

Hypothesis 1, that monitoring could increase effort, is tested in Tables 4.6 and 4.7 which assess the impact of two sets of manager-reported supervision practices: one related to ways of making employees aware of their job responsibilities and the other related to quality monitoring. The two dependent variables for effort are employee-reported individual perception of the level of effort required on the job, and manager-reported workplace change in effort.. A general finding for both tables is of some supporting evidence for accepting *Hypothesis 1*, in that supervision has a positive impact on both measures of effort, but practices differ in their impact on individual effort and workplace changes in effort, as well as within sub-samples of the data categorised by sector and type of occupation.

Starting with an overview of **Table 4.6**, the first set of HRM practices, related to supervision is comprised of 8 ways in which managers were prompted by the questionnaire to assess how their company is ‘making employees aware of their job

responsibilities'.⁶⁰ The 8 possible answers were: (1) supervision; (2) job descriptions; (3) standard operational procedures; (4) induction; (5) staff manual; (6) individual objectives; (7) team objectives; and (8) competency standards. Out of these 8 HRM practices, when looking across all the five levels of the data split (see Table 4.5), three practices are marginally significantly or significantly related with employee effort (namely, supervision, individual objectives and competency standards) and five are significantly or marginally significantly related to workplace effort (namely, job descriptions, standard operational procedures, individual objectives, team objectives and competency standards). Notably, all of the 8 supervision HRM practices are insignificant across the whole un-split sample of employees; it is only when data is split into levels that the three HRM practices appear as significant or marginally significant. However, for workplace effort, all but one (the exception is usage of job descriptions) of the five significant or marginally significant HRM practices are so across the whole sample of industries and occupations, albeit the size of the coefficients is under 1 pp.

The HRM practices that are insignificant in Table 4.6 are using induction and using the staff manual to make employees aware of their responsibilities. It may be that practices of longer-term application than at job induction, and practices that encompass more visible approaches to supervision than the staff manual, work better in making the employees aware of their responsibilities.

There are some marked differences between practices that have an impact on employees stating that their jobs require them to work hard and practices that have

⁶⁰ The exact question is: 'What are the main methods by which [employees in the largest occupational group] are made aware of their job responsibilities?'

an impact on changes in workplace effort. Only using competency standards and using individual objectives work for both employee effort and changes in workplace effort. Supervision has an impact at the individual level but not at workplace level, and at individual level it is only effective for non professionals in the private sector, increasing the likelihood of employee reporting that their jobs require them to work hard, but with small size effects. Team objectives, standard operational procedures and job descriptions (the latter only in the public sector for non professional employees) only have an impact on changes in workplace effort, but not on employee effort.

Moving away from the overview of Table 4.6 and towards the specific regression in the private sector, on professionals, the only practice that has an impact on individual effort is competency standards, increasing the likelihood of employees reporting that their jobs make them work hard by 5 pp. With regard to workplace effort, using competency standards is marginally significant and has a positive but a lower size impact of 3.1 pp. In the category of non-professionals in the private sector, using supervision and individual objectives are both marginally significant for employee effort with a positive coefficient size around 3 pp. For workplace effort, standard operational procedures are also marginally significant, but with a negative coefficient size - however the size is under 1 pp.

In the public sector and with regard to professionals, workplace effort seems to be slightly hampered when standard operational procedures are in place, with a 2.1 pp higher likelihood of managers to declare that workplace effort has decreased. Non-professionals in the public sector are mainly responsive to competency standards, with significant increases of 6.3 pp in individual effort. For workplace effort job

descriptions are significant and positive, while individual objectives is only marginally significant and negative, but both have very low impact sizes (under 1 pp).

To summarise by sector the results from Table 4.6, it can be noticed that the highest impact on effort in the private and the public sectors comes from competency standards. The coefficient sizes are positive and are the highest in Table 4.6, yet they are not very large, at only 5 or 6 pp. In both sectors, standard operational procedures may have some negative influences on workplace effort (2.1 pp in the public sector for professionals). Summarising the results by respondent across sectors, it can be noticed that individual effort increases if supervision, individual objectives and competency standards are used; and that workplace effort increases if team objectives, competency standards and job descriptions are used, but the impact of all these practices is rather small. It may be that, whilst practices of work supervision do seem to have an impact on work effort and the findings allow this study not to reject *Hypothesis 1*, they are not necessarily the best and most effective tool to encourage increases in employee effort or workplace effort.

Turning next to **Table 4.7**, it includes a set of 6 HRM practices encoded from answers provided by managers to the question: ‘How do you monitor the quality of the work undertaken at this workplace?’. The six possible answers are: (1) customer surveys; (2) external audits; (3) individual employees; (4) inspectors; (5) manager / supervisor; and (6) records on faults / complaints. All but the latter have some positive effect on individual effort, the highest impact being from external auditors for professionals in the private sector (7.6 pp), but the lowest effect also being associated with this practice (in the public sector for professional workers: decreases of 6 pp). For

workplace effort, two practices are insignificant: using records of faults / complaints, and using individual employees to monitor quality of work. The reason why using records of faults / complaints appears to be insignificant across all regressions presented in Table 4.7 may be that a focus on avoiding the failures does not work - instead, the five other practices which are not necessarily focused on keeping track of failure, seem to work better.

It becomes apparent in the first instance when regressions are run on the whole sample (i.e. with the data not split) that customer surveys and inspectors are associated across both employee and workplace measures of effort with increases in effort. The largest impact is a highly significant 7.6 pp increase in workplace effort in the case of using customer surveys, followed by a marginally significant increase of 4.4 pp in the case of using inspectors to monitor the quality of work.

More effects appear when the sample is split by sector. Starting in the private sector, professionals' effort is almost equally responsive to monitoring via customer surveys and managers / supervisors (increases of 4 to 5 pp for individual effort). The highest increase in Table 4.7 for individual effort comes from using external auditors, at 7.6 pp. For their non-professional counterparts, individual effort is responsive to monitoring via individual employees and inspectors, both with coefficient sizes of around 2 pp, whereas workplace effort is responsive to using customer surveys (7 pp) but significantly negatively affected by the use of external auditors (a decrease of up to 14 pp for workplace effort). The latter effect may be explained by the fact that the external auditing process could be perceived as slowing down the progress of work due to the administration and additional processing of

documentation required, as well as having the effect of changing the behaviour of employees towards the externally imposed objectives.

In the public sector, professionals appear to deploy high levels of workplace effort if the manager or supervisor are used to monitor quality, but this increase of 17 pp is only associated with workplace effort going up “a little”, whereas workplace effort has a negative likelihood of 2.2 pp to be going up “a lot”, and a 8 pp likelihood to stay the same or decrease. Where external auditors are used, there is a marginally significant negative impact on individual effort of 6 pp.⁶¹

Similarly to private sector non-professionals, non-professionals in the public sector workplaces are more likely to see their effort improving “a lot” if customer surveys are used (14 pp). They dislike the practice of monitoring quality via supervisor or manager, which is significant but only increases the likelihood of the workplace seeing “effort going up a little” (by 12 pp) whereas it decreases the likelihood that effort goes up a lot by 2.1 pp. It may be that the assessment of quality by manager or supervisor leaves the door open to subjective or inconsequential evaluations of quality, leading to decreases in effort, whereas the use of customer surveys appears to be overall the best solution to monitoring quality in such a way as to solicit more effort. Individual employees are more likely to report that their jobs require them to work hard if inspectors are used to monitor the quality of work.

⁶¹ For an example with regard to the influence of external auditors, in response to universities being audited via the Research Assessment Exercise, a change of behaviour in British Academia could be that lecturers devote less time to teaching and more time to publishing in the journals that are generally considered high ranking.

Overall, Table 4.7 shows that the only category of respondents who are likely to feel that their jobs require them to work harder as a result of having the manager or supervisor assess their quality of work, are individual professionals in the private sector. There is a lot of variation in the practices that are likely to make employees state having to work hard. With regard to changes for the better in workplace effort, the practice that appears most significant (7.6 pp likelihood that workplace effort has gone up a lot for the whole sample) is the usage of customer surveys, albeit not in professional occupations.

4.4.2. Complementarities and the effect of HRM practices development on effort

To test *Hypothesis 2a*, that complementarities exist within HRM practices and that more modern groups of HRM practices have a positive impact on effort than more traditional practices, three models are run in Tables 4.8 – 4.10.

Table 4.8 uses three systems of HRM practices to determine whether they have an impact on effort. The systems have been identified via factor analysis, whereby a large exhaustive set of HRM practices obtained from the WERS 98 survey were analysed to see how their incidence is reflected in companies. Based on the review of the literature which found positive relationships between workplace performance and training, consultation, and to some extent job autonomy and pay related to performance, the hypothesis is that the more these practices are implemented (i.e. System 1 in Table 4.4), the bigger the impact on effort.

Indeed, an overview of all results depicted in Table 4.8 suggests that the 3 HRM Systems (System 3 is the base variable used as comparison) have a significant impact on both measures of effort. The biggest marginal effect is an increase of 5 pp (and almost 7 pp) if System 1 is implemented across the whole sample (respectively in the non-professional private sector), when compared to having implemented HRM System 3 (the base variable). Results also show that System 1 tends to have larger positive effects than System 2. The latter can be interpreted as support for the hypothesis that the more a company implements the 4 practices from System 1, the higher the likelihood of increased work effort - especially so for the private sector. However, it can be remarked that in the public sector only System 2 has an impact on effort.

Continuing the assessment of *Hypothesis 2*, and moving next to part 2b, **Tables 4.9** and 4.10 introduce an employee-only, and respectively a manager-only, set of HRM practices. The dependent variable is employee-reported effort in the employee-only model, where 10 out of the 11 practices are significant in at least at one level of data analysis. Similarly, the dependent variable is manager-reported effort in the manager-only model, where 16 out of the 28 practices are significant at least at one level of data analysis. Therefore there appears to be further support for *Hypothesis 2b*, in that HRM practices have an impact on measures of employee and workplace effort.

HRM practices are entered into the regression in accordance with Table 4.3, but without a measure of pecuniary incentives, since it would have been endogenous and, in any case, such a measure was not available in the data. This order is: work organisation; communication; consultation; pecuniary incentives other than

wages; non-pecuniary incentives; and training practices.⁶² Base variables are not indicated for Tables 4.9 and 4.10 since the vast majority of these variables are dummy variables.

With regard to the 11 HRM practices used as independent variables in Table 4.9, these practices enter as consistently significant across sectors: flexible working hours available, and the two practices related to training and learning. The availability of flexible working hours is associated with a negative impact on individual effort (a decrease of up to 7.3 pp in the likelihood that professionals in the public sector report high levels of effort). This result is not necessarily counterintuitive if one assumes that ideally employees would like to minimise effort. Yet, under the alternative assumption that a satisfied employee deploys more effort, this result raises the question of whether, overall, reducing the number of working hours via flexibility leads to an overall reduction in effort, even though productivity may be higher (which is a hypothesis that could only hold up to the point where diminishing returns to work set in).

Gray's (2002) study on the impact of family-friendly policies on performance, also using WERS 98, offers a partial explanation for this result: the incidence of family-friendly policies is found to be positively correlated with company performance but notes that 'employers offering policies which enable employees with families to maintain a full-time presence in the workplace e.g. a workplace nursery, have better performance than those which offer policies which result in reduced-

⁶² Employee-reported answers for HRM practices in these categories could not be found in all cases, due to the limited scope of the employee questionnaire. For instance, there is no employee-reported variable that could be categorised as a pecuniary incentive other than the wage.

visibility e.g. working from home, part-time work' (Gray 2002 : abstract).⁶³ Similarly, it may be assumed that flexible work hours, as well as job autonomy (which also enters negatively in relation to effort especially for professionals in the public sector), lower the likelihood that individual effort is high to the extent that these two practices allow for reduced-visibility at work.

The other two practices that are consistently related to individual effort across all sectors relate to measures of the same variable, the base category being 'both training and learning are encouraged'. Therefore, the negative sign with which these two variables enter in the regression points out the positive impact of learning and skill development on individual effort, while showing that in the absence of both learning and skill development, the likelihood that employees consider that their jobs make them work hard could decrease by as much as almost 8 pp (in the professional public sector). Where significant, communication and consultation-related HRM practices are positively related to individual effort, but marginal effects are relatively lower, peaking at 4.8 pp in the professional public sector.

Table 4.9 only offers limited support to the hypothesis that, as one advances in the hierarchy of HRM practices shown in Table 4.3, HRM practices offer more effective incentives. Especially with regard to the analysis of individual effects, results may rather constitute a warning to taking the effects of HRM practices for granted in assuming *a priori* that new or more modern HRM practices would improve individual performance.

⁶³ Gray (2002) does not investigate the impact of this practice on employee effort, so a direct comparison is not possible.

A discussion of personal, firm and job characteristics in Table 4.9

With regard to the impact of personal, job and firm characteristics on individual effort, female workers appear to report higher levels of individual effort. This is in line with the literature on gender-discrepancies, which highlights the fact that women may over-report effort (Bielby and Bielby 1988). It could also be the case that women tend to be more likely to be employed in the service than in the production sector, with Green (2004) reporting that effort intensification in Britain has also occurred more in the service than in the production sector.

In comparison to respondents aged between 25-39 (lower prime), the age at which respondents seem to report high effort levels is the 40-49 (upper prime), especially for professionals in the public sector. This finding is in line with the intuitive assumption that accumulated experience in professional occupations is transferred into productivity towards the upper prime age, when family responsibilities may still be high.⁶⁴

Family responsibilities may also explain why married people work harder than their counterparts, and why not having children enters negatively in the model (i.e. respondents without children are less likely to deploy high effort when compared to the base variable which consists of respondents with children). This is also in line with the literature on the effects of marriage on effort (see Neumark and Postlewaite 1995 or Mehay and Bowman 2005). Considerably high marginal effects are noticed for those of ethnic background other than white, a finding which could be speculated as

⁶⁴ On the role of accumulated experience, Bagger (2004) finds that higher returns for the relatively older employees stem more from market experience rather than from seniority.

the consequence of these respondents being under relatively higher perceived pressure to work hard, possibly to fight off discriminatory assessments of their performance (see Elvira and Town 2001 for an account of racial workplace discrimination), or to outperform their white counterparts (especially if say, effort at work were to be related to securing long-term employment for respondents interested in remaining in Britain).

The higher the educational qualification, the more likely it is that the respondent reports working hard. Notably, having a higher degree in the professional public sector is related to 8 pp higher likelihood to work hard. This finding is also in line with the literature (for instance, see Chevalier *et al* 2005).

Firm size effects are shown to be inversely related to effort, in that, in comparison to firms of 100-500 employees, higher firm sizes (over 500 employees) lead to a lower probability of reporting that individual effort is high. There is no observed significant effect of lower sized firms on effort. Thus, at the level of individual effort, this study fails to confer support to results reported by Green (2004) who suggests that technological changes, potentially leading to lower effort, are more prominent in establishments with less than 100 employees.

Controversially, temporary and fixed-term workers appear to be less likely than permanent workers to report high levels of individual effort. The same holds for part-time when compared to full-time workers. These results differ from some of the studies on the impact of the type of contract on effort.

Union membership appears to have a positive and highly significant relationship to effort, with relatively large marginal effects (up to 11 pp in the professional public sector). Industry type also has a large effect on effort, in particular with workers employed in education being 20 pp more likely to strongly agree that their jobs require them to work hard.

Unsurprisingly, the level of skill and occupation are also strongly related to effort: being a professional or a manager may increase the likelihood of reporting high levels of effort by up to 12 pp, respectively 19 pp. Working in the private sector is associated with a marginally higher likelihood to report high levels of effort (2 pp). The variables reported towards the end of Table 4.9 have been used to split the data at the respective level, hence results are only reported in the main model with all respondents.

Table 4.10 continues the analysis of the impact of HRM practices on effort, changing the focus from the employee-reported individual effort measure to a model where only the manager-reported dependent and independent variables are included. In terms of assessing whether more recent HRM practices have a higher impact on increasing workplace effort, again there does not appear to be sufficient evidence to support this hypothesis, since the relatively large marginal effects on effort observed in the Table are distributed rather equally along the hypothesised HRM progress spectrum consisting of the six groups of HRM practices in Table 4.8.

The largest impact on workplace effort comes from workplaces having pay equality. Other practices that also enter in a positive relationship with workplace effort

are briefings, workplace strategic plan, asking employees to help outside their job descriptions (thereby potentially increasing the desire to acquire new skills and the opportunities for personal development); informing employees about the investment plans; profit related pay, profit sharing or Employee Shared Ownership Schemes (ESOP); using recruitment tests to screen job applicants; providing training; non-pecuniary benefits such as car allowance and private health insurance; benchmarking (18 pp); and Just-In-Time (17%) (the latter two being significant only for the non-professionals in the public sector).

The only two practices that are significantly related to workplace effort but impact negatively on employee effort are whether employees have job control (up to -11 pp in for professionals in the public sector) and whether employees have guaranteed job security (up to -11 pp in for non-professionals in the public sector). This is in line with the findings from Green (2004), and even more so with King (2000) who offers an in-depth discussion on the topic and concludes by advising that communication HRM practices need to be deployed in order to minimise the negative consequences of white-collar jobs insecurity or increased flexibility.⁶⁵

⁶⁵ In more detail, Green (2004) notes that 'there is no evidence as to whether job insecurity actually does generate harder work' (Green 2004: 720). An alternative view, identifying significant effects of job security, is presented by Blanchflower and Oswald (1999) who find that job satisfaction is higher for those with secure jobs.

4.5. Conclusions and summary

This chapter aims to determine sets of HRM practices that could lead to higher employee and company work effort, as well as looking at the impact on effort of practices such as supervision and quality monitoring. The cross-section British Workplace Employment Relations Survey 1998 has been chosen for this study as it has the advantage that responses are obtained from both employees and their managers. This advantage is used to assess which practices impact solely on employee or on workplace effort, and which impact on both. Results suggest that certain HRM practices have a significant impact on the employee and workplace effort measures included in this study.

To test the hypothesis that monitoring has a positive impact on effort, this study attempted to uncover those HRM practices related to supervision which have an impact on employee and organisational effort. HRM practices related to supervision have been analysed in two separate sets: methods of making employees aware of their job responsibilities, and ways of monitoring work quality. A general finding for both tables is of some supporting evidence for accepting *Hypothesis 1*, in that supervision has a positive impact on both measures of effort, but practices differ in their impact on individual effort and workplace changes in effort, as well as within sub-samples of the data categorised by sector and type of occupation. The HRM practices with a positive impact on effort are: setting competency standards and using customer surveys. There appear to be strong negative effects on workplace effort if external audits are used, and if the supervisor or the manager is single-handedly monitoring quality. These results appear to contradict the assumptions of the principal-agent theory.

The principal implication for the management of a workplace is that a right balance has to be struck, in that: (1) too much monitoring can be detrimental to effort; (2) some monitoring practices do not have a significant impact on employee and workplace effort; (3) there is considerable variation between practices that have an impact on individual effort and those that have an impact on the workplace effort; (4) there is considerable variation in impact of supervisory HRM practices across subsamples when data is split by sector and occupation; and, finally, (5) monitoring itself may not be enough to ensure high levels of employee effort or workplace effort (since coefficient sizes are overall not very large).

Three systems of HRM complementary practices most likely to have an impact on effort are identified. They include various levels of incidence for job control, consultation, performance related pay and employee-paid training. Training, and communication and consultation appear to have a strong and consistent impact on individual effort. Pay equality, benchmarking and strategic planning play a major role in increasing workplace effort. This evidence validates the practices most widely adopted in organisations.

An analysis separating different categories of HRM practices in order to assess whether the historical development of HRM practices (as presented in Bailey 2000) would also be matched by continuous increases in the efficiency of HRM practices, does not lend support to this hypothesis. Instead, HRM practices most likely to have an impact on individual effort comprise: allowing for employee job control, consultation, performance related pay and employee-paid training. In fact, training and communication and consultation appear to have a strong and consistent impact on

individual effort as well as workplace effort, while benchmarking and strategic planning play a major role in increasing workplace effort. However, some practices which decrease the amount of supervised control, such as job autonomy, lead to decreases in individual effort, but working from home is associated with higher individual effort.

Data limitations imposed by the WERS 98 could be overcome by future datasets incorporating a more explicit measure of employee effort intensity, and a similar one from the perception of the manager (ideally both measures being a level or a change type of measure), whilst copying the most important feature of the WERS 98: the ability of researchers to match the employee and the managerial response to the same workplace.

It is believed and hoped that the wealth of information made available via conducting this present research may be beneficial not only to the practitioners in management (and ultimately to employees), but also to governing bodies and policy makers.

Summary for Chapter IV

- This chapter investigates the determinants of work effort in Britain. Specifically, the study aims to determine whether HRM practices lead to effort being increased by creating workplace settings which encourage employees to deploy more effort.
- Data limitations imposed by the WERS 98 could be overcome by future datasets incorporating a more explicit measure of employee effort intensity, and a

similar one from the perception of the manager (ideally both measures being a level or a change type of measure), whilst copying the most important feature of the WERS 98: the ability of researchers to match the employee and the managerial response to the same workplace.

- The contributions of this chapter are that it:
 - analyses the impact of HRM practices on the separate views of the employee and managerial-reported work effort with regard to the same place of work;
 - analyses intensive effort, as opposed to the majority of extant research which is based on extensive measures of effort;
 - uses subjective constructs of effort - a feature which puts this analysis at the forefront of modern developments in labour economics;
 - attempts to bridge the HRM and economics literature by using a conceptualisation of effort perceived as desirable by employees and employers;
 - advances a conceptual framework for the study of work effort based on a chronological development of HRM practices. It generates a classification of HRM practices;
 - contributes to the study of effort by sourcing and presenting the main theoretical and empirical developments that can generate a framework of research; this input is much needed to research effort which is a complex and unclear area;
 - uses employee data, enabling the presentation and analysis of the employee side of the story. This differentiates this chapter from the extant literature. It also adds to a small basis of studies which have taken into account employees' perspective.
- The dataset used is the cross-section of the WERS 1998, which offers over 19,000 employer-employee matched observations in Britain.
- The hypotheses are:

- (1) concentrating on HRM practices related to supervision: HRM practices related to supervision have a positive impact on effort; and
 - (2) using a framework for classifying all available HRM practices in the dataset, it is hypothesised that a) complementarities exist in HRM practices; b) the development of HRM practices is along progressive lines, with more modern HRM practices having a higher impact on effort.
- Two dependent variables are used: a level measure of effort intensity based on how hard individual employees perceive that their jobs make them work; and a change measure of workplace effort based on the perception of the manager of the workplace where the employee interviewed is working, with regard to how much a change there has been in the respective workplace effort.
 - The main findings are:
 - supervision and control at work have a positive impact on measures of employee effort and workplace effort. Practices with highest impacts are setting competency standards and using customer surveys;
 - the main implications for practitioners, as well as for the research framework that future studies into the impact of supervision on effort could use, are as follows: (1) too much monitoring can be detrimental to effort; (2) some monitoring practices do not have a significant impact on employee and workplace effort; (3) there is considerable variation between practices that have an impact on individual effort and those that have an impact on the workplace effort; (4) there is considerable variation in impact of supervisory HRM practices across sub-samples when data is split by sector and occupation; and, finally, (5) monitoring and supervision practices on their own may not be enough to ensure high levels of employee effort

or positive changes in workplace effort (since coefficient sizes reported in this study are overall not very large).

- implementing a system of practices which comprises training, consultation, performance-related pay and employee job control can increase effort by up to 11 pp, whereas not implementing learning or training in the workplace can decrease the likelihood of employees working hard by 8 pp. It seems that governmental approaches to training and skills for the workforce (e.g. The New Deal), aiming towards making continuous learning a focus in Britain, are heading in the right direction;
- not enough support is found to suggest that more advanced practices have a higher impact on effort. This constitutes a warning for HRM practitioners and HRM researchers that HRM progress cannot be taken for granted i.e. those practices heralded to be the “most modern” or “the newest” are not necessarily having (the highest) impact on employee and workplace effort ;
- the single largest impact on workplace effort comes from the workplace having pay equality. HR managers in charge of devising their pay systems could take this finding into account and analyse the extent to which their workplace has a dispersed pay scheme.

Table 4.6 The impact on effort of methods of making employees aware of job responsibilities (Marginal effects from ordered probit)

Dependent variable	Employee effort			Workplace effort				
	Coeff. (Pvalues)	0	1	2	Coeff. (Pvalues)	0	1	2
Level of data split: All								
Mgr.: Supervision	0.028 (0.319)	0.009	0.002	-0.011	-0.084 (0.340)	-0.008	-0.001	0.009
Mgr.: Job descriptions	-0.012 (0.626)	0.004	0.001	-0.005	0.025 (0.734)	0.004	0.000	-0.004
Mgr.: Standard operational procedures	-0.016 (0.474)	-0.017	-0.004	0.022	0.158 (0.024)**	0.005	0.001	-0.005
Mgr.: Induction	-0.006 (0.845)	0.004	0.001	-0.005	0.034 (0.694)	0.002	0.000	-0.002
Mgr.: Staff manual	0.024 (0.274)	-0.013	-0.003	0.016	0.002 (0.979)	-0.007	-0.001	0.008
Mgr.: Ind. objectives	-0.004 (0.873)	-0.025	-0.006	0.031	0.156 (0.029)**	0.001	0.000	-0.001
Mgr.: Team objectives	0.018 (0.424)	-0.028	-0.007	0.035	0.120 (0.097)*	-0.005	-0.001	0.006
Mgr.: Competency standards	0.027 (0.221)	-0.019	-0.005	0.025	0.138 (0.047)**	-0.008	-0.001	0.009
Obs.	22272				20147			

Note 1: In the column titles:

- for employee effort: "2" denotes "strongly agree", "1" denotes "agree", and "2" denotes neutral or all other levels of disagreement to the employee-rated statement "my job requires that I work very hard";

- for workplace effort: "2" denotes "gone up a lot", "1" denotes "gone up a little", and "2" denotes "stayed the same" or all other levels of gone down, with regard to the manager-rated question: "if there has been any change at this workplace compared to five years ago, how substantial has that change been with regard to how hard people work here?"

Note 2: The significance level of the p-value is signalled using: *** for p<0.01, ** for p<0.05, and * for p<0.1

Note 3: The model also includes controls for age, gender, marital status, educational qualifications, occupation, contract type, firm size and sector. These results are available by request.

Note 4: Independent variables entered are dummy variables. For more information, see Appendix C.3.

Table 4.6 C *Contd.*

Dependent variables	Employee effort			Workplace effort				
	Coeff. (Pvalues)	0	1	2	Coeff. (Pvalues)	0	1	2
Mgr.: Supervision	-0.031 (0.554)	0.025	0.014	-0.039	-0.216 (0.119)	0.008	0.003	-0.011
Mgr.: Job descriptions	0.036 (0.406)	-0.001	0.000	0.001	-0.035 (0.742)	-0.009	-0.003	0.013
Mgr.: Standard operational procedures	0.008 (0.857)	-0.002	-0.001	0.003	0.026 (0.822)	-0.002	-0.001	0.003
Mgr.: Induction	0.057 (0.209)	-0.003	-0.002	0.005	-0.005 (0.968)	-0.015	-0.005	0.020
Mgr.: Staff manual	-0.018 (0.654)	0.007	0.004	-0.011	-0.137 (0.194)	0.005	0.002	-0.006
Mgr.: Ind. objectives	-0.045 (0.265)	-0.038	-0.018	0.055	0.234 (0.031)**	0.011	0.004	-0.016
Mgr.: Team objectives	0.006 (0.889)	-0.019	-0.009	0.029	0.120 (0.284)	-0.001	-0.001	0.002
Mgr.: Competency standards	0.089 (0.029)**	-0.033	-0.017	0.050	0.200 (0.072)*	-0.022	-0.009	0.031
Obs.	4985				4464			

See footnotes to Table 4.6 for level of data split "All".

Table 4.6 Ctnd,

Dependent variables	Employee effort			Workplace effort			
	Coeff. (Pvalues)	0	1	2	0	1	2
Level of data split: Nonprof. Private							
Mgr.: Supervision	0.075 (0.070)*	-0.027	-0.001	0.028	-0.020 (0.864)	0.003	0.022
Mgr.: Job descriptions	-0.027 (0.407)	0.019	0.001	-0.020	-0.022 (0.806)	-0.001	-0.008
Mgr.: Standard operational procedures	-0.027 (0.417)	-0.001	0.000	0.001	0.173 (0.069)*	-0.001	-0.008
Mgr.: Induction	-0.000 (0.995)	0.014	0.001	-0.015	0.039 (0.745)	0.000	0.000
Mgr.: Staff manual	0.007 (0.824)	-0.007	0.000	0.007	-0.048 (0.568)	0.000	0.002
Mgr.: Ind. objectives	0.057 (0.089)*	-0.030	-0.002	0.032	0.085 (0.355)	0.001	0.017
Mgr.: Team objectives	0.014 (0.674)	-0.041	-0.003	0.044	0.149 (0.110)	0.000	0.004
Mgr.: Competency standards	-0.021 (0.502)	-0.002	0.000	0.002	0.109 (0.210)	0.000	-0.006
Obs.	9778				8946		

See footnotes to Table 4.6 for level of data split "All".

Table 4.6 Ctnd,

Dependent variables	Employee effort			Workplace effort			
	Coeff. (Pvalues)	0	1	2	0	1	2
Level of data split: Prof. Public							
Mgr.: Supervision	-0.011 (0.862)	0.041	0.045	-0.087	0.002	0.002	-0.004
Mgr.: Job descriptions	-0.054 (0.623)	-0.018	-0.015	0.033	0.011	0.010	-0.021
Mgr.: Standard operational procedures	-0.054 (0.288)	-0.043	-0.039	0.081	0.011	0.010	-0.021
Mgr.: Induction	-0.022 (0.767)	0.001	0.001	-0.002	0.004	0.004	-0.008
Mgr.: Staff manual	0.073 (0.194)	-0.022	-0.020	0.042	-0.015	-0.013	0.028
Mgr.: Ind. objectives	-0.051 (0.313)	0.008	0.008	-0.016	0.010	0.009	-0.020
Mgr.: Team objectives	0.069 (0.228)	-0.026	-0.024	0.050	-0.014	-0.013	0.027
Mgr.: Competency standards	0.001 (0.990)	-0.004	-0.003	0.007	0.000	0.000	0.000
Obs.	3516						

See footnotes to Table 4.6 for level of data split "All".

Table 4.6 Ctnd,

Dependent variables	Employee effort			Workplace effort			
	Coeff. (Pvalues)	0	1	2	0	1	2
Level of data split: Nonprof. Public							
Mgr.: Supervision	0.024 (0.699)	0.007	0.001	-0.008	-0.047 (0.767)	0.001	0.007
Mgr.: Job descriptions	0.029 (0.647)	-0.037	-0.004	0.041	0.301 (0.075)*	0.001	0.009
Mgr.: Standard operational procedures	-0.004 (0.937)	-0.033	-0.004	0.038	0.165 (0.197)	0.000	-0.001
Mgr.: Induction	-0.082 (0.178)	0.001	0.000	-0.001	0.075 (0.637)	-0.001	-0.025
Mgr.: Staff manual	0.016 (0.720)	-0.029	-0.004	0.033	0.161 (0.258)	0.001	0.005
Mgr.: Ind. objectives	-0.029 (0.539)	-0.033	-0.004	0.038	0.311 (0.033)**	-0.001	-0.009
Mgr.: Team objectives	-0.022 (0.636)	0.008	0.001	-0.009	-0.036 (0.811)	-0.001	-0.007
Mgr.: Competency standards	0.091 (0.038)**	-0.054	-0.009	0.063	0.225 (0.114)	0.002	0.027
Obs.	3993				3642		

See footnotes to Table 4.6 for level of data split "All".

Table 4.7 The impact on effort of quality monitoring methods (Marginal effects from ordered probit)

Dependent variables	Employee effort			Workplace effort				
	Coeff. (Pvalues)	0	1	2	0	1	2	
Level of data split: All								
Mgr.: customer surveys	0.051 (0.022)**	-0.015	-0.002	0.017	0.193 (0.006)***	-0.049	-0.027	0.076
Mgr.: external auditors	0.006 (0.893)	-0.002	0.000	0.002	-0.041 (0.766)	0.010	0.006	-0.016
Mgr.: individual employees	0.025 (0.258)	-0.007	-0.001	0.008	0.049 (0.489)	-0.012	-0.007	0.019
Mgr.: inspectors	0.066 (0.002)***	-0.019	-0.003	0.022	0.112 (0.086)*	-0.028	-0.016	0.044
Mgr.: manager/supervisor	0.058 (0.110)	-0.017	-0.002	0.019	-0.044 (0.695)	0.011	0.007	-0.018
Mgr.: records on faults/complaints	0.006 (0.803)	-0.002	0.000	0.002	0.028 (0.724)	-0.007	-0.004	0.011
Obs.	22308				20183			

See footnotes to Table 4.6 for level of data split "All".

Table 4.7 Ctnnd.

Dependent variables	Employee effort			Workplace effort				
	Coeff. (Pvalues)	0	1	2	0	1	2	
		Level of data split: Prof. Private						
Mgr.: customer surveys	0.137 (0.001)***	-0.035	-0.013	0.047	0.086 (0.438)	-0.022	-0.012	0.034
Mgr.: external auditors	0.211 (0.048)**	-0.048	-0.029	0.076	-0.242 (0.220)	0.068	0.025	-0.093
Mgr.: individual employees	-0.034 (0.422)	0.008	0.003	-0.012	0.046 (0.688)	-0.012	-0.006	0.018
Mgr.: inspectors	0.062 (0.116)	-0.016	-0.006	0.022	0.164 (0.121)	-0.041	-0.024	0.065
Mgr.: manager/supervisor	0.127 (0.047)**	-0.033	-0.009	0.043	0.142 (0.396)	-0.038	-0.018	0.056
Mgr.: records on faults/complaints	-0.032 (0.478)	0.008	0.003	-0.011	-0.071 (0.590)	0.018	0.010	-0.028
Obs.	4997				4476			
		Level of data split: Nonprof. Private						
Mgr.: customer surveys	0.014 (0.663)	-0.005	0.000	0.004	0.180 (0.044)**	-0.051	-0.018	0.068
Mgr.: external auditors	-0.010 (0.891)	0.003	0.000	-0.003	-0.400 (0.014)**	0.127	0.014	-0.140
Mgr.: individual employees	0.072 (0.028)**	-0.023	0.002	0.022	0.044 (0.621)	-0.012	-0.005	0.017
Mgr.: inspectors	0.064 (0.043)**	-0.021	0.001	0.019	0.107 (0.208)	-0.030	-0.011	0.041
Mgr.: manager/supervisor	0.027 (0.576)	-0.009	0.001	0.008	-0.044 (0.734)	0.012	0.005	-0.017
Mgr.: records on faults/complaints	0.016 (0.675)	-0.005	0.000	0.005	0.154 (0.127)	-0.044	-0.014	0.058
Obs.	9774				8957			

See footnotes to Table 4.6 for level of data split "All".

Table 4.7 Ctned.

Dependent variables	Employee effort			Workplace effort				
	Coeff. (Pvalues)	0	1	2	0	1	2	
		Level of data split: Prof. Public						
Mgr.: customer surveys	0.078 (0.125)	-0.016	-0.014	0.030	0.224 (0.108)	-0.040	-0.048	0.089
Mgr.: external auditors	-0.156 (0.061)*	0.035	0.025	-0.060	0.374 (0.149)	-0.054	-0.089	0.143
Mgr.: individual employees	-0.022 (0.654)	0.005	0.004	-0.009	0.166 (0.254)	-0.030	-0.036	0.066
Mgr.: inspectors	0.057 (0.238)	-0.012	-0.011	0.022	0.104 (0.449)	-0.019	-0.023	0.041
Mgr.: manager/supervisor	0.039 (0.676)	-0.008	-0.007	0.015	-0.712 (0.011)**	0.082	0.172	-0.254
Mgr.: records on faults/complaints	0.026 (0.641)	-0.005	-0.005	0.010	-0.013 (0.932)	0.002	0.003	-0.005
Obs.	3529				3101			
		Level of data split: Nonprof. Public						
Mgr.: customer surveys	0.036 (0.411)	-0.012	0.001	0.011	0.342 (0.018)**	-0.080	-0.056	0.136
Mgr.: external auditors	0.053 (0.521)	-0.017	0.001	0.016	0.265 (0.318)	-0.053	-0.052	0.104
Mgr.: individual employees	0.022 (0.599)	-0.007	0.001	0.007	0.059 (0.656)	-0.013	-0.010	0.024
Mgr.: inspectors	0.074 (0.083)*	-0.024	0.002	0.022	-0.000 (0.998)	0.000	0.000	0.000
Mgr.: manager/supervisor	0.002 (0.981)	-0.001	0.000	0.001	-0.562 (0.049)**	0.095	0.119	-0.214
Mgr.: records on faults/complaints	0.022 (0.689)	-0.007	0.001	0.007	-0.027 (0.865)	0.006	0.005	-0.011
Obs.	4008				3649			

See footnotes to Table 4.6 for level of data split "All".

Table 4.8 The impact on effort of three systems of HRM practices (Marginal effects from ordered probit)

Dependent variables	Employee effort			Workplace effort				
	Coeff. (Pvalues)	0	1	2	Coeff. (Pvalues)	0	1	2
		Level of data split: All						
System 1	0.012 (0.586)	-0.004	0.000	0.004	0.184 (0.001)***	-0.036	-0.012	0.048
System 2	0.071 (0.001)***	-0.021	-0.003	0.024	0.112 (0.007)***	-0.037	-0.011	0.048
Obs.	22344	20206						
		Level of data split: Prof. Private						
System 1	0.028 (0.472)	-0.007	-0.003	0.010	0.149 (0.037)**	-0.028	-0.015	0.043
System 2	0.070 (0.098)*	-0.017	-0.007	0.024	0.069 (0.356)	-0.038	-0.021	0.059
Obs.	4999	4478						
		Level of data split: Nonprof. Private						
System 1	0.024 (0.479)	-0.008	0.000	0.007	0.278 (0.000)***	-0.060	-0.009	0.069
System 2	0.084 (0.016)**	-0.027	0.001	0.026	0.118 (0.059)*	-0.038	-0.004	0.042
Obs.	9808	8978						
		Level of data split: Prof. Public						
System 1	0.075 (0.266)	-0.015	-0.014	0.030	-0.021 (0.890)	-0.007	-0.006	0.013
System 2	0.097 (0.037)**	-0.020	-0.018	0.038	0.099 (0.174)	-0.026	-0.025	0.051
Obs.	3529	3101						
		Level of data split: Nonprof. Public						
System 1	-0.037 (0.562)	0.012	-0.001	-0.011	-0.080 (0.610)	0.006	0.001	-0.007
System 2	0.054 (0.273)	-0.018	0.001	0.016	0.072 (0.354)	-0.036	-0.006	0.042
Obs.	4008	3649						

See footnotes 1, 2 and 3 to Table 4.6 for level of data split "All". Base variable here is HRM System 3 (see Table 4.4).

Table 4.9 The impact of HRM practices on employee reported effort - Employee answers only (Marginal effects from ordered probit)

HRM Practice	All			Prof. Private			Nonprof. Private			Prof. Public			Nonprof Public			
	0	1	2	0	1	2	0	1	2	0	1	2	0	1	2	
	Coeff.			Coeff.			Coeff.			Coeff.			Coeff.			
	(Pvalue)			(Pvalue)			(Pvalue)			(Pvalue)			(Pvalue)			
Emp.: Has job autonomy	-0.033 (0.047)*	0.010	0.001	-0.011	0.002	0.001	-0.003	0.015	-0.005	0.000	0.004	-0.044	-0.112 (0.009)**	0.022	0.021	-0.042 (0.301)
Emp.: Mgt. keeps every one up to date with changes	0.062 (0.002)**	-0.018	-0.003	0.020	-0.017	-0.007	0.023	0.044 (0.147)	-0.014	0.001	0.013	0.039	0.100 (0.036)**	-0.020	-0.019	0.092 (0.044)**
Emp.: Mgt. responds to employee suggestions	0.034 (0.090)*	-0.010	-0.002	0.011	-0.014	-0.006	0.020	0.026 (0.405)	-0.008	0.000	0.008	0.048	0.123 (0.013)**	-0.024	-0.024	-0.027 (0.590)
Emp.: Information dissemination: newsletter, email or notebook	-0.068 (0.175)	0.019	0.004	-0.023	0.034	0.019	-0.053	-0.078 (0.230)	0.025	0.000	-0.024	-0.058	-0.147 (0.463)	0.027	0.031	0.073 (0.580)
Emp.: Consulted over at least one job aspect	0.041 (0.026)*	-0.012	-0.002	0.014	-0.014	-0.005	0.020	0.076 (0.007)**	-0.024	0.001	0.023	-0.001	-0.001 (0.973)	0.000	0.000	-0.003 (0.939)
Emp.: Flexible working hours available	-0.115 (0.000)**	0.034	0.004	-0.038	0.041	0.014	-0.055	-0.081 (0.008)**	0.026	-0.002	-0.024	-0.073	-0.189 (0.000)**	0.039	0.034	-0.033 (0.471)
Emp.: Job sharing available	-0.028 (0.261)	0.008	0.001	-0.009	-0.004	-0.002	0.005	-0.079 (0.063)*	0.026	-0.003	-0.023	-0.008	-0.020 (0.670)	0.004	0.004	0.002 (0.961)
Emp.: Parental leave available	-0.063 (0.001)**	0.018	0.002	-0.021	0.009	0.004	-0.013	-0.066 (0.036)**	0.021	-0.002	-0.020	-0.023	-0.060 (0.171)	0.012	0.011	-0.077 (0.070)*
Emp.: Working at home available	-0.006 (0.840)	0.002	0.000	-0.002	-0.017	-0.007	0.024	0.149 (0.030)**	-0.046	-0.002	0.047	0.006	0.015 (0.784)	-0.003	-0.003	-0.076 (0.404)
Emp.: Either training or skill development is encouraged	-0.098 (0.000)**	0.028	0.004	-0.032	0.020	0.007	-0.027	-0.070 (0.024)**	0.023	-0.002	-0.021	-0.072	-0.187 (0.000)**	0.039	0.033	-0.100 (0.035)**
Emp.: Neither training nor skill development is encouraged	-0.111 (0.000)**	0.033	0.003	-0.036	0.047	0.013	-0.060	-0.067 (0.076)*	0.022	-0.002	-0.020	-0.078	-0.204 (0.005)**	0.045	0.033	-0.078 (0.204)

Employee, job and workplace characteristics

	0	1	2	0	1	2	0	1	2	0	1	2	0	1	2	
Emp.: Female	0.194 (0.000)**	-0.056	-0.008	0.064	-0.045	-0.022	0.066	0.171 (0.000)**	-0.055	0.003	0.052	0.075	0.194 (0.000)**	-0.040	-0.036	0.181 (0.002)**
Emp.: Young (16-24)	0.064 (0.039)*	-0.018	-0.003	0.021	-0.013	-0.006	0.019	0.036 (0.392)	-0.011	0.001	0.011	0.013	0.033 (0.788)	-0.007	-0.006	-0.048 (0.582)
Emp.: Upperprime (40-49)	0.019 (0.354)	-0.006	-0.001	0.006	-0.022	-0.010	0.032	-0.030 (0.397)	0.010	-0.001	-0.009	0.037	0.095 (0.057)*	-0.019	-0.018	-0.012 (0.808)

See footnotes 1, 2, and 3 to Table 4.6 for level of data split "All". The only base variables here is both training and learning are encouraged. For employee, job and workplace characteristics, base variables are: male, age up to retirement, not married, with children, high school qualification, size 100-499, jobs done by both male and female, permanent contract, full-time job, Sector: Production, skilled non-manual, and public sector. For more information, see Appendix C.3

Table 4.9 Ctn'd.

HRM Practice	All		Prof. Private		Nonprof. Private		Prof. Public		Nonprof. Public								
	0	1	0	1	0	1	0	1	0	1							
	Coeff. (Pvalue)		Coeff. (Pvalue)		Coeff. (Pvalue)		Coeff. (Pvalue)		Coeff. (Pvalue)								
Emp.: Has an illness or a disability	0.011 (0.752)	0.000	-0.003	0.004	-0.018 (0.830)	0.005	0.002	-0.006	-0.042 (0.425)	0.014	-0.001	-0.012	0.002	0.128 (0.085)*	-0.040	0.001	0.039
Emp.: Married	0.064 (0.001)**	-0.002	-0.019	0.021	0.079 (0.078)*	-0.020	-0.007	0.027	0.066 (0.029)**	-0.021	0.002	0.020	0.045	0.117 (0.026)**	-0.021	0.001	0.011
Emp.: No dependent children	-0.046 (0.018)*	0.002	0.013	-0.015	-0.088 (0.021)*	0.022	0.009	-0.031	-0.004 (0.911)	0.001	0.000	-0.001	-0.027	-0.070 (0.129)	0.014	0.013	-0.002
Emp.: Ethnic background other than white	0.209 (0.000)**	-0.018	-0.055	0.073	0.124 (0.155)	-0.029	-0.015	0.044	0.239 (0.001)**	-0.071	-0.007	0.078	0.042	0.107 (0.318)	-0.021	-0.022	0.361 (0.004)**
Emp.: Degree or higher	0.066 (0.012)*	-0.003	-0.019	0.022	0.077 (0.073)*	-0.019	-0.008	0.027	-0.011 (0.840)	0.004	0.000	-0.003	0.083	0.215 (0.002)**	-0.045	-0.038	-0.057 (0.419)
Emp.: A-level	-0.036 (0.127)	0.001	0.011	-0.012	0.049 (0.328)	-0.012	-0.005	0.017	-0.067 (0.064)*	0.022	-0.002	-0.020	-0.013	-0.032 (0.699)	0.007	0.006	-0.042 (0.409)
Emp.: No qualifications	-0.006 (0.804)	0.000	0.002	-0.002	0.068 (0.354)	-0.016	-0.008	0.024	0.039 (0.255)	-0.013	0.001	0.012	0.005	0.013 (0.899)	-0.003	-0.002	-0.057 (0.296)
Emp.: Has vocational qualifications	-0.028 (0.110)	0.001	0.008	-0.009	-0.084 (0.019)*	0.021	0.008	-0.029	-0.008 (0.752)	0.003	0.000	-0.003	-0.027	-0.070 (0.111)	0.014	0.013	-0.008 (0.843)
Mgr.: Firm size: over 500	-0.115 (0.000)**	0.003	0.034	-0.037	-0.125 (0.013)*	0.032	0.010	-0.042	-0.112 (0.022)**	0.037	-0.004	-0.033	-0.030	-0.077 (0.287)	0.016	0.014	-0.130 (0.042)**
Mgr.: Firm size 50-99	0.014 (0.634)	-0.001	-0.004	0.004	0.001 (0.987)	0.000	0.000	0.000	0.015 (0.704)	-0.005	0.000	0.005	0.037	0.095 (0.124)	-0.019	-0.019	-0.109 (0.080)*
Mgr.: Firm size 20-49	0.017 (0.547)	-0.001	-0.005	0.006	0.029 (0.612)	-0.007	-0.003	0.010	0.002 (0.962)	-0.001	0.000	0.001	0.038	0.097 (0.134)	-0.019	-0.019	-0.004 (0.941)
Mgr.: Firm size 10-19	-0.048 (0.345)	0.002	0.014	-0.016	0.026 (0.773)	-0.006	-0.003	0.009	-0.082 (0.279)	0.027	-0.003	-0.024	0.001	0.003 (0.984)	-0.001	-0.001	-0.028 (0.811)
Mgr.: Jobs mainly/only done by female	0.027 (0.271)	-0.001	-0.008	0.009	0.005 (0.933)	-0.001	-0.001	0.002	0.029 (0.393)	-0.009	0.001	0.009	0.031	0.078 (0.187)	-0.016	-0.015	0.078 (0.147)
Mgr.: Jobs mainly/only done by male	-0.121 (0.000)**	0.004	0.035	-0.039	-0.118 (0.004)*	0.029	0.012	-0.041	-0.104 (0.016)**	0.034	-0.003	-0.031	-0.063	-0.165 (0.018)**	0.035	0.028	-0.040 (0.488)
Emp.: Tenure: over 10 years	0.054 (0.007)*	-0.003	-0.015	0.018	0.075 (0.063)*	-0.018	-0.008	0.026	0.014 (0.649)	-0.004	0.000	0.004	0.022	0.056 (0.256)	-0.011	-0.011	0.066 (0.152)
Emp.: Temporary contract	-0.170 (0.000)**	0.001	0.052	-0.053	-0.162 (0.195)	0.043	0.011	-0.054	-0.162 (0.018)**	0.054	-0.008	-0.046	-0.091	-0.240 (0.029)**	0.055	0.036	-0.080 (0.362)
Emp.: Fixed-term contract	-0.118 (0.021)*	0.002	0.035	-0.038	-0.190 (0.072)*	0.051	0.011	-0.062	-0.216 (0.043)**	0.074	-0.014	-0.060	-0.034	-0.087 (0.381)	0.018	0.015	0.004 (0.971)

Table 4.9 Ctnnd.

HRM Practice	All			Prof. Private			Nonprof. Private			Prof. Public			Nonprof Public							
	Coef. (Pvalue)	0	1	2	Coef. (Pvalue)	0	1	2	Coef. (Pvalue)	0	1	2	Coef. (Pvalue)	0	1	2				
Emp.: Part-time job	-0.254 (0.000)**	0.077	0.002	-0.080	-0.149 (0.044)*	0.039	0.011	-0.050	-0.266 (0.000)**	0.089	-0.013	-0.076	-0.205 (0.001)**	0.045	0.034	-0.079	-0.231 (0.000)**	0.077	-0.012	-0.065
Emp.: I am a union member	0.162 (0.000)**	-0.046	-0.008	0.054	-0.028 (0.525)	0.007	0.003	-0.010	0.098 (0.004)**	-0.031	0.001	0.030	0.284 (0.000)**	-0.062	-0.048	0.109	0.164 (0.000)**	-0.054	0.006	0.048
Mgr.: Sector: Wholesale and retail	0.084 (0.020)*	-0.024	-0.005	0.028	0.105 (0.124)	-0.025	-0.012	0.037	0.098 (0.020)**	-0.031	0.001	0.030	0.238 (0.072)*	-0.042	-0.053	0.095	0.148 (0.332)	-0.046	0.000	0.046
Mgr.: Sector: Hotel Rest/ Trans & Communication	0.091 (0.017)*	-0.025	-0.005	0.031	0.135 (0.038)*	-0.032	-0.016	0.048	0.119 (0.012)**	-0.037	0.000	0.037	0.289 (0.112)	-0.050	-0.065	0.115	-0.051 (0.656)	0.017	-0.002	-0.015
Mgr.: Sector: Financial/Other business services	0.092 (0.007)*	-0.026	-0.005	0.031	0.121 (0.015)*	-0.029	-0.013	0.043	0.130 (0.005)**	-0.041	0.000	0.041	-0.022 (0.878)	0.005	0.004	-0.009	-0.505 (0.003)**	0.185	-0.065	0.120
Mgr.: Sector: Public administration	0.060 (0.236)	-0.017	-0.003	0.020	-0.102 (0.333)	0.027	0.008	-0.034	0.343 (0.000)**	-0.097	-0.019	0.115	0.148 (0.161)	-0.029	-0.030	0.058	-0.185 (0.044)**	0.061	-0.007	0.054
Mgr.: Sector: Education	0.345 (0.000)**	-0.088	-0.034	0.122	0.332 (0.002)*	-0.070	-0.052	0.123	0.008 (0.936)	-0.002	0.000	0.002	0.509 (0.000)**	-0.097	-0.102	0.199	-0.151 (0.149)	0.051	-0.008	0.043
Mgr.: Sector: Health	0.273 (0.000)*	-0.071	-0.024	0.095	0.371 (0.000)*	-0.078	-0.060	0.137	0.305 (0.000)**	-0.088	-0.012	0.101	0.187 (0.107)	-0.036	-0.038	0.074	-0.089 (0.390)	0.030	-0.004	0.026
Mgr.: Sector: Other community services	0.039 (0.535)	-0.011	-0.002	0.013	0.392 (0.000)**	-0.080	-0.066	0.146	0.015 (0.897)	-0.005	0.000	0.005	0.096 (0.529)	-0.018	-0.019	0.038	-0.282 (0.015)**	0.098	-0.023	-0.075
Emp.: Professional	0.342 (0.000)*	-0.089	-0.031	0.120																
Emp.: Managerial	0.523 (0.000)**	-0.125	-0.064	0.189																
Emp.: Associated professional	0.023 (0.510)	-0.007	-0.001	0.008																
Emp.: Skilled manual	0.005 (0.872)	-0.002	0.000	0.002																
Emp.: Partly skilled	0.043 (0.222)	-0.012	-0.002	0.014																
Emp.: Unskilled	0.119 (0.003)*	-0.033	-0.008	0.041																
Mgr.: Private sector	0.062 (0.082)*	-0.018	-0.002	0.020																
Obs.	20401				4727				8748				3331				3595			

Table 4.10 The impact of HRM practices on manager reported workplace effort - Manager answers only (Marginal effects from ordered probit)

HRM Practice	All			Prof. Private			Nonprof. Private			Prof. Public			Nonprof. Public			
	0	1	2	0	1	2	0	1	2	0	1	2	0	1	2	
	Coeff. (Pvalue)			Coeff. (Pvalue)			Coeff. (Pvalue)			Coeff. (Pvalue)			Coeff. (Pvalue)			
Mgr.: Workplace has strategic plan	0.262 (0.007) ***	-0.069	-0.032	0.101	0.292 (0.040) **	-0.078	-0.034	0.112	0.271 (0.013) **	-0.079	-0.021	0.099	0.652 (0.051) *	-0.141	-0.112	0.253 (0.042) **
Mgr.: Workplace uses benchmarking	0.134 (0.061) *	-0.033	-0.020	0.053	0.092 (0.395)	-0.023	-0.014	0.036	0.061 (0.504)	-0.017	-0.006	0.023	0.167 (0.305)	-0.026	-0.040	0.066 (0.001) ***
Mgr.: Workplace uses just-in-time systems	-0.006 (0.935)	0.002	0.001	-0.003	-0.092 (0.399)	0.023	0.013	-0.036	-0.048 (0.602)	0.013	0.005	-0.018	0.138 (0.552)	-0.019	-0.035	0.054 (0.028) **
Mgr.: Teamwork in over 60% of staff	-0.025 (0.745)	0.006	0.004	-0.010	-0.027 (0.812)	0.006	0.004	-0.011	-0.031 (0.742)	0.008	0.003	-0.012	0.187 (0.352)	-0.031	-0.044	0.074 (0.970)
Mgr.: Emps. asked to help outside job descriptions	0.215 (0.002) ***	-0.053	-0.032	0.084	0.124 (0.244)	-0.031	-0.018	0.049	0.231 (0.008) ***	-0.064	-0.023	0.087	0.415 (0.004) ***	-0.064	-0.099	0.163 (0.107)
Mgr.: Communication or consultation via meetings	0.096 (0.177)	-0.023	-0.015	0.038	0.176 (0.103)	-0.043	-0.027	0.069	0.179 (0.053) *	-0.048	-0.021	0.068	0.042 (0.784)	-0.006	-0.010	0.017 (0.665)
Mgr.: Emps. informed about establishment finance	0.012 (0.892)	-0.003	-0.002	0.005	-0.008 (0.951)	0.002	0.001	-0.003	-0.157 (0.142)	0.041	0.019	-0.060	-0.113 (0.586)	0.016	0.028	-0.044 (0.108)
Mgr.: Emps. informed about internal investment plans	0.154 (0.044) **	-0.038	-0.023	0.061	0.095 (0.435)	-0.024	-0.014	0.037	0.165 (0.098) *	-0.046	-0.016	0.062	0.381 (0.021) **	-0.061	-0.089	0.150 (0.330)
Mgr.: Briefings are used	0.187 (0.107)	-0.049	-0.024	0.073	0.114 (0.495)	-0.029	-0.015	0.044	0.172 (0.227)	-0.049	-0.014	0.063	0.682 (0.020) **	-0.150	-0.114	0.264 (0.195)
Mgr.: Quality/Problem-solving/Cont. Improv. Groups are used	-0.063 (0.379)	0.015	0.010	-0.025	0.017 (0.874)	-0.004	-0.003	0.007	-0.095 (0.297)	0.026	0.010	-0.036	-0.119 (0.441)	0.018	0.029	-0.047 (0.161)
Mgr.: Suggestion schemes used	0.110 (0.148)	-0.026	-0.018	0.043	0.129 (0.275)	-0.031	-0.020	0.051	0.089 (0.343)	-0.024	-0.010	0.034	0.080 (0.630)	-0.012	-0.020	0.032 (0.494)
Mgr.: Not making changes without consulting with employees	-0.041 (0.583)	0.010	0.006	-0.016	0.007 (0.953)	-0.002	-0.001	0.003	-0.013 (0.885)	0.004	0.001	-0.005	-0.222 (0.255)	0.030	0.056	-0.086 (0.359)
Mgr.: 4 weeks or more paid annual leave available	0.047 (0.740)	-0.012	-0.007	0.018	0.208 (0.250)	-0.056	-0.024	0.080	0.082 (0.611)	-0.023	-0.008	0.031	0.001 (0.998)	0.000	0.000	0.000 (0.755)

See footnotes to Table 4.9.

Table 4.10 Cntd.

HRM Practice	All						Prof. Private			Nonprof. Private			Prof. Public			Nonprof. Public			
	0	1	2	Coeff. (Pvalu e)	0	1	2	Coeff. (Pvalu e)	0	1	2	Coeff. (Pvalu e)	0	1	2	Coeff. (Pvalu e)	0	1	2
Mgr.: Employer pension scheme available	-0.022 (0.829)	0.005	0.003	-0.009	-0.010 (0.948)	0.002	0.001	-0.004	0.073 (0.541)	-0.020	-0.007	0.027	-0.478 (0.199)	0.052	0.124	-0.176 (0.554)	0.028	0.040	-0.068
Mgr.: Pay varies according to: hours worked	0.071 (0.387)	-0.017	-0.011	0.028	0.054 (0.661)	-0.013	-0.008	0.021	0.013 (0.907)	-0.004	-0.001	0.005	0.135 (0.388)	-0.020	-0.033	0.053 (0.223)	-0.035	-0.039	0.074
Mgr.: Performance related pay	0.064 (0.419)	-0.015	-0.010	0.025	0.211 (0.081)	-0.050	-0.034	0.083	0.012 (0.901)	-0.003	-0.001	0.004	0.069 (0.736)	-0.010	-0.017	0.027 (0.842)	-0.006	-0.008	0.014
Mgr.: Profit-related pay, Profit sharing or ESOP	0.175 (0.041)	-0.042	-0.027	0.069	0.084 (0.478)	-0.021	-0.012	0.033	0.175 (0.079)	-0.049	-0.017	0.066	0.485 (0.172)	-0.053	-0.126	0.179 (0.056)	-0.067	-0.122	0.189
Mgr.: Workforce has pay equality	0.375 (0.147)	-0.074	-0.074	0.149	-0.108 (0.839)	0.028	0.014	-0.042	0.117 (0.699)	-0.030	-0.015	0.045	0.904 (0.052)	-0.072	-0.224	0.296 (0.005)	-0.104	-0.324	0.429
Mgr.: Empls. have job control	-0.113 (0.103)	0.027	0.018	-0.045	-0.060 (0.584)	0.015	0.009	-0.024	-0.110 (0.195)	0.030	0.012	-0.042	-0.288 (0.067)	0.040	0.072	-0.112 (0.351)	0.024	0.031	-0.055
Mgr.: Option of working from home available	0.023 (0.747)	-0.005	-0.003	0.009	-0.098 (0.347)	0.024	0.015	-0.039	0.047 (0.595)	-0.013	-0.005	0.018	-0.076 (0.636)	0.011	0.019	-0.030 (0.608)	-0.013	-0.016	0.029
Mgr.: Empls. have guaranteed job security	-0.018 (0.847)	0.004	0.003	-0.007	-0.004 (0.981)	0.001	0.001	-0.001	0.114 (0.401)	-0.030	-0.014	0.044	-0.145 (0.378)	0.023	0.034	-0.058 (0.089)	0.054	0.058	-0.113
Mgr.: Company car or allowance	0.098 (0.302)	-0.023	-0.016	0.039	0.005 (0.969)	-0.001	-0.001	0.002	-0.014 (0.916)	0.004	0.001	-0.005	0.300 (0.135)	-0.041	-0.076	0.116 (0.082)	-0.054	-0.083	0.138
Mgr.: Private health insurance available	0.202 (0.044)	-0.046	-0.035	0.080	0.312 (0.015)	-0.073	-0.050	0.123	0.161 (0.153)	-0.042	-0.020	0.062	0.250 (0.584)	-0.032	-0.064	0.096 (0.893)	-0.012	-0.016	0.028
Mgr.: Sick pay in excess of statutory available	-0.048 (0.621)	0.011	0.008	-0.019	-0.173 (0.250)	0.040	0.029	-0.069	-0.070 (0.575)	0.019	0.008	-0.026	0.241 (0.249)	-0.040	-0.056	0.096 (0.950)	0.002	0.003	-0.005
Mgr.: Over 60% of supervisors have training in people mgt. skills	0.005 (0.949)	-0.001	-0.001	0.002	-0.027 (0.812)	0.007	0.004	-0.011	0.110 (0.238)	-0.030	-0.012	0.042	0.051 (0.736)	-0.008	-0.013	0.020 (0.425)	0.020	0.024	-0.044
Mgr.: Recruitment tests are used	0.158 (0.035)	-0.037	-0.025	0.063	0.139 (0.237)	-0.034	-0.021	0.055	0.099 (0.288)	-0.027	-0.011	0.038	0.030 (0.868)	-0.004	-0.007	0.012 (0.009)	-0.065	-0.099	0.163
Mgr.: Over 40% of staff had off-the-job training	0.139 (0.064)	-0.034	-0.021	0.055	0.156 (0.161)	-0.039	-0.023	0.061	0.175 (0.065)	-0.047	-0.019	0.066	0.077 (0.640)	-0.012	-0.019	0.031 (0.755)	-0.009	-0.011	0.019
Mgr.: Workplace accredited as an Investor in People	0.095 (0.192)	-0.023	-0.015	0.038	0.090 (0.464)	-0.022	-0.014	0.035	0.030 (0.749)	-0.008	-0.003	0.012	0.202 (0.176)	-0.029	-0.050	0.079 (0.640)	-0.012	-0.015	0.026

CHAPTER V

TRAINING AND PROMOTION IN THE BRITISH LABOUR MARKET: DETERMINANTS, INTERRELATIONSHIPS AND IMPACT ON WAGES

5.1. Introduction

Do current employers offer training to employees whom they intend to promote? Do previous training or promotion, with the current or previous employer, matter for the likelihood of being offered more training or promotion? This chapter uses a panel of individuals from the 13 waves of the British Household Panel Survey (1991-2003) in order to focus on two workplace practices, training and promotion, and assess the way employers offer episodes of training and promotion. Splitting the data by gender, sector and occupation, estimates for probit, bivariate probit, and fixed effects models are obtained in order to analyse the determinants, interrelationships, and wage impact of recent training and promotion with a person's current employer.

The need for this research is threefold. Firstly, there is a gap in the empirical economic literature related to the assessment of the link between training and promotion. With some exceptions, very little empirical research has singled out joint analysis of these two practices. When this is the case, previous studies mostly concentrate on training and promotion practices considered separately.⁶⁶ To this

⁶⁶ For instance, a search on Academic Search Premier and Business Search Premier Databases, which contain peer-reviewed journal content from more than four decades ago, shows that less than five articles in the economic domain contain the words "training" and "promotion" in their title. Further information on these articles shows that none investigates empirically the link between training and promotion in a model controlling for their interaction. To date, the studies that come somewhat closer to the research topic of this chapter are: Prendergast 1993 and 1999 (theoretical), Pergamit and Veum 1999 (empirical), Paulson Gjerde 2002 (empirical), Booth *et al* 2003 (empirical), Eguchi 2004 (theoretical), Melero 2004 and Owan 2004 (theoretical).

extent, models which analyse the incidence of training tend not to refer to prior promotion, while models that examine promotion prospects tend not to focus on prior training. To decide whom to train and promote remains, however, a complex and costly issue for firms. This chapter aims to fill the gap in the empirical literature by estimating probit and bivariate probit models in which training can affect promotion, and promotion is allowed to affect the incidence of training.

Secondly, this chapter expands existing knowledge of training and promotion by adding both a time dimension, and a sense of whether training and promotion have occurred within the same employment relationship. The former is achieved by exploiting the distinctive potential of the data used here, which records multi-spell observations for each time an individual enters and leaves employment. The latter consists of an original approach of generating combined dependent variables on training and promotion episodes. These measure whether an episode of training (respectively of promotion) has occurred, and also take into account whether an individual has changed employer in between the training or promotion episodes.

Thirdly, this chapter brings to light new empirical evidence from the British Household Panel Survey (BHPS). This is a multi-purpose dataset that offers a wide range of employment related information, as well as a long record of data collection, but whose explanatory potential with regard to training and promotion has not yet been fully explored. To date, Booth *et al* (2003) offer the only other study utilising the BHPS, their research concentrating on gender differences in models of promotion and wages.

The importance of training in increasing productivity has been well-documented in the economic literature that analyses its impact on country and company performance (see Appendix D.1 for examples of studies on training according to the country where they apply). A notable overview showing the positive link between training, and individual and company performance is given by Bartel 2000. However, the empirical economic literature on training has consistently signalled that for more than two decades, not all employees have benefited equally from training. Most notable differences have occurred by gender and by previous accumulation of human capital, including both education and previous training. The impact of training on earnings also remains a topic of debate, with some research claiming that too few studies attempt correct estimations (Frazis and Loewenstein 2005). Research challenges arise due to difficulties in differentiating between social and private returns to training, or specific and general human capital, in the assumed context of imperfectly competitive markets.

The issues highlighted above set out this chapter's agenda of research with regard to training, namely attempting to expand the current knowledge of the training incidence and provision in the British labour market.

The second workplace practice researched in this chapter is promotion. Unlike training, promotion does not benefit from the same level of attention with regard to its regulation in the workplace, nor in British government policy initiatives. As noted by Pergamit and Veum (1999), the reason for this relative lack in the empirical attention may be due to the poor quality of the data available on the complex processes which lead to promotion (e.g. in-house politics of power which

could be confidential or hard to isolate for research). Researchers on promotion tend to have preferred the theoretical side of analysis, with the empirical side needing to be more developed. A succinct review of the literature suggests that there appear to be relatively fewer empirical studies on promotion than on training, with the majority dedicated either to signalling mainly gender-based differences in promotion prospects, or to the impact of promotion on earnings (Lewis 1986, Lazear and Rosen 1990, Macpherson and Hirsh 1995, Hersch and Viscusi 1996, McCue 1996, Francesconi 2001, Booth *et al* 2003 – see Appendix D.2 for a selection of promotion studies by country where they apply). A characteristic of empirical research on promotion is that initial empirical studies have predominantly concentrated on the American labour market, with most authors preferring to use case study data.

The research challenge of finding and using relevant data on promotion is only partially resolved by the BHPS dataset. Unlike the post-1997 substantive expansion of the BHPS questionnaire on training, to date there is no question in the dataset specifically designed to ask employees whether they have been promoted.⁶⁷ However, this chapter successfully models a combined dependent variable for promotion, generated from the self-reported reasons of changing job, and from whether a change of employer has occurred. This dependent variable is used to assess the determinants of promotion in models controlling for training. The link between promotion and training, and the impact of promotion on wages are also estimated.

⁶⁷ From wave 8 onwards, the questions on training were considerably expanded to permit investigation into intensity, duration and location of training spells. This chapter focuses on all 13 waves (1991 - 2003), hence these time-truncated variables are not used here due to the need of consistency in measurement.

The chapter is structured as follows. Section 5.2 presents details of the theoretical models underpinning the research, outlines a review of the relevant literature on training and promotion, sets out the theoretical model that serves as the conceptual basis for this chapter, and states the set of hypotheses tested. Section 5.3 describes the data used, the variables generated, and the methodology for the estimation of the econometric models. Section 5.4 discusses the results and places them in the context of the extant literature. Section 5.5 presents the conclusions of this research and opportunities for further research, followed by the chapter summary.

5.2. Theory and literature review

This section continues to assess the role of training and promotion in the workplace, by looking succinctly at more theoretical and empirical contributions from the economic literature. It then builds a theoretical framework for the empirical analysis conducted in this chapter, which is used alongside the literature reviews in generating the hypotheses tested.

5.2.1. A review of the literature on training

An extensive and growing literature has been generated to explore the economic consequences of training. In accordance with the seminal contributions made by Becker (1962 and 1964), an established path in this literature has been to analyse the benefits of training mainly in relation to the theoretical model of human capital accumulation. Training is split between specific and general in order to decide who should pay for it and the optimum amount of investment. As Becker (1964)

concludes, an employer is only likely to pay for training that is specific to the firm, and not for skills that can be used outside it if the incumbent is poached by rival firms.

Problematically for researchers trying to disentangle the effects and types of training, specific training (or experiential learning) can also lead to accumulation of general human capital for employees, who may then choose to put their skills in practice at a different firm than the one who provided for their specific training. Developments of the Beckerian framework of human capital include the hold-up problem (Acemoglu and Pischke 1998) which refers to firms and employers under-investing in training in the context of imperfect competition. Acemoglu and Pischke (1998) offer an analysis of the hold-up problem in a model with asymmetric information and its consequences with regard to training.

This is especially the case when general and specific skills are difficult to separate, hence firms fear that they are paying for employees to acquire transferable skills while rival firms are able to exploit the externalities arising from such general training. Therefore, in the hold-up scenario, both parties under-invest in specific human capital (Felly and Harris 1996).

There is reason to believe that if some certainty were to exist regarding the post-training continuation of employment, for instance via promotion, investment in training would be higher, since the hold-up problem would be minimised.⁶⁸ This could start to explain the discrepancy in training incidence between permanent

⁶⁸ In the American market, Finegold *et al* (2005) finds that training decreases labour turnover.

employees and those in part-time, temporary or in more flexible employment contracts.⁶⁹

Conversely, a policy linking promotion to training in order to minimise turnover, could have the effect of employers cherry-picking their employees by training only those whom they intend to promote, or promoting only those who train. Indeed, Vignoles *et al* (2004) provide evidence that employers may be rational in the way they allocate employees to training programmes, since returns to training are shown to be bigger for those receiving it than for those who do not get chosen.

Apart from the few studies mentioned above - see footnote 70 which lists studies coming close to this chapter only to the extent that they make partial attempts to link training and promotion in a single analysis - no other empirical research looks at the link between training and promotion in detail.

Thus, with regard to training, the purpose of this chapter is to investigate its determinants and incidence in relation to promotion, as well as the impact of training on wages. The hypotheses tested on training are constructed by also taking into consideration three of the most notable trends signalled in the literature so far, which are succinctly described below.

First, in the British labour market of 1980s, studies have documented gender differences in access to training, which can indicate that women are being discriminated against, or that they have different training needs and preferences

⁶⁹ Empirical evidence in support of this relative underinvestment comes from USA and across Europe. For instance, see Arulampalam and Booth 1997, or Loewenstein and Spletzer 1999.

(Green 1991, Arulampalam and Booth 1997). In the 1990s, this gender gap is expected to have faded, with increased female labour participation and the expansion of institutional forces advocating the role of education and training such as the National Vocational Qualifications System, Investors in People, and other Youth Training Schemes. Nevertheless, the jury seems to be out on whether these schemes have proven to work well in the long run (for some critical evaluations and opinions, see Bradley 1995, Grugulis and Bevitt 2002, Grugulis 2003 or Hoque 2003).

A second long-documented source of discrepancy in training incidence comes from a positive association between education/ skill level and amount of training obtained (from mid 1970s with Rosen 1976 to more recent studies such as Frazis *et al* 1998, Vignoles *et al* 2004, Gershuny 2005 or Ariga and Brunello 2006). This discrepancy could lead to the creation of a virtuous cycle for workers with complex skills, for whom higher access to training translates into even higher productivity and human capital. On the contrary, individuals with basic skills would tend to be trapped into a vicious cycle of lower training incidence. Even if one were to use a utilitarian perspective and propose that the latter is acceptable (say, by arguing that the jobs of those unskilled would not require much training), the issue remains of concern, be it at least in view of favouring a fair society and of allowing everyone to benefit from social returns to training. An even more contentious point is that the ‘egg and chicken’ dilemma arises, in that it could be hard to determine whether those with poor skills are rightly doing the jobs appropriate to their potential, or whether they are trapped in those jobs due to not having opportunities to train.⁷⁰

⁷⁰ For a study that takes into account the effects of education on training, see Ariga and Brunello (2006) who find that Thai firms tend to compensate with on-the-job training in the case of those with lower education in order to offset the unwanted consequences of wide human capital differences (i.e.

The effect of training on wages has been a third widely documented area of research. Barel (1995), Booth *et al* (2003) and Vignoles *et al* (2004) are but a few of the studies that offer compelling evidence on employer-provided training leading to higher worker wages, with Dearden *et al* (2006) offering some of the most recent evidence that investment in training translates into increases in hourly wages.

This subsection turns next to reviewing the literature on promotion, the second workplace practice analysed in this chapter.

5.2.2. A review of the literature on promotion

The theoretical study of job assignment to workers has been a long-standing feature of labour economics. Promotion is a significant signalling tool for employees, as well as for current and future employers, which could denote a wide range of positive personal characteristics such as high ability, knowledge, skill, effort, dedication or commitment. In the case of current employees, promotions can be seen as a form of reward, as an assurance that efforts are monitored and recognised, as a better job match, or as a way to secure higher earnings.⁷¹ Within organisations, promotions represent for current employers a significant non-pecuniary means of motivation to increase effort or skill acquisition, also forming a sense of hierarchy and control. Additionally, the event of being promoted with a current company signals to rival firms or future employees that the respective employee has a higher than average actual and potential ability (Waldman 1984). If the employer has the means to hold

widening income gaps in a developing country). It is suggested that on the job training ‘partially offsets the existing differences in education’ (Ariga and Brunello 2006 : 626).

⁷¹ In a US case study, Lazear (1998) reports that ‘stars’, namely employees who get promoted, may earn as much as 4.4 times their initial pay, whereas the increase for ‘losers’ is only 2.3 times their initial earnings.

onto the current employer, then ‘labour raiding’ – whereby a firm intends to actively ‘steal’ an employee of another firm – can only occur if the employee is a better match with the hiring firm. Therefore, promotions are a critical tool in employee retention.⁷²

Some of the most quoted theories of promotion have modelled it as a ‘prize’ won in company ‘tournaments’ for productivity (Lazear and Rosen 1981) or for revealed job ability (Lazear and Rosen 1990), as company ‘internal job ladders’ (Doeringer and Piore 1971), or as job assignment to different ladders (Katz and Gibbons 1992, Sattinger 1993).⁷³ The latter model considers the method by which tasks are assigned to employees, whether by taking into account comparative advantages or not. If coupled with the model of human capital investment – where Becker (1964) demonstrated that specific training makes an employee more valuable to the firm – this theoretical framework suggests that the probability of being promoted should be positively linked to human capital accumulation, thereby clearly indicating that the link between training and promotion merits empirical investigation. Conversely, the workers who have given up leisure and invested effort to acquire higher firm specific skills, should have a greater probability of promotion, otherwise the worker would have an incentive to participate in training investment.⁷⁴ However, a problem signalled by Kahn and Huberman (1988) is the two-sided uncertainty, defined as (1) the firm having an incentive to renege on promoting an employee who has obtained training, so that the firm does not have to pay the higher wage associated with promotion; as well as (2) the employees losing the incentive to train if they think that the firm may renege.

⁷² The literature on ‘raiding’ is well-established. See Owen 2004 and McCannon 2007.

⁷³ For an in-depth review of theoretical models for promotion and of their empirical offspring, see Gibbons and Waldman 1999.

⁷⁴ The most notable model on promotion which incorporates the effect of leisure has been developed by Mincer (1974).

A solution is suggested by Prendergast (1993) who assumes that firms could attach wages to different tasks (and not to different workers). Prendergast's (1993) model shows that a task-based wage scale would generate incentives for employees to acquire skills, because of the firm's commitment that training *would* translate into promotion to a higher wage. Prendergast (1993)'s theoretical model has two assumptions.

Firstly, firms do not have the opportunity to develop reputations such as for not renegeing on initial promises of promotion. Secondly, building trust in the company-employee relationship is essential for the model to create incentives for skill acquisition. In order to study this theoretical model empirically, its assumptions need to be relaxed, mainly by replacing the firm's absolute promise of post-training promotion with a probability of such promotion.

Since increasing skills still would make promotion more probable, and employees know this (that is, firms can develop a reputation), employees compete for training even though there is no certainty of a promotion at the end of a training episode. After training, the company may layoff those employees not promoted, or these employees may voluntarily decide to leave the company, both options being costly to the firm's reputation and resulting in the loss of potential profit from leakage of trained labour.⁷⁵

To decide whom to train and promote, this model extension would thus need to incorporate an additional element of mutual trust as a further determinant of

⁷⁵ The fact that employees not promoted would be laid-off is what Kahn and Huberman (1988) referred to as the up-or-out contract.

promotion over and above firm specific skills, such as ‘loyalty’ and ‘commitment’ to the organisation, attributes which are also revealed in the training process. Hence, promotion and training appear to be two processes intrinsically connected within firms, which brings further support to the need for research conducted in this chapter.

With regard to determinants of promotion, this chapter aims to expand the current understanding of factors leading to different promotion probabilities. Possibly the most entrenched finding in the empirical literature is gender-biased probabilities of promotion (e.g. one of the most recent additions to this literature comes from Pekkarinen and Vartiainen 2006), with women being discriminated in opportunities for promotion. Additionally, as highlighted in Booth *et al* (2003), the gender-disadvantage may not tell the whole story, because women could also be disadvantaged in the salary rewards to promotion relative to their male counterparts.

Finally, the theoretical pursuit of understanding the connection between training and promotion is advanced through the work of Gibbons and Waldman (1999) and Bernhardt (1995). This chapter borrows from their contributions in order to construct its rationale for analysis. Therefore, their contributions are singled out and presented in the next section, as the theoretical framework for this chapter’s empirical analysis.

5.2.3. Theoretical framework for analysing training and promotion

Gibbons and Waldman (1999 : 2382) offer a theoretical model of job assignment which assumes that a worker’s ability is determined by tenure and the

stock of training. In this model, a firm is assumed to have only two jobs, job 1 and job 2. The ability of worker, judged by their productivity, i is denoted by η_i .

In the first instance, worker i is assigned to job j and produces output $a_j + b_j\eta_i$. Let $a_1 > a_2$ and $b_1 < b_2$ and let η^* solve

$$a_1 + b_1\eta^* = a_2 + b_2\eta^*.$$

Then workers with ability $\eta_i < \eta^*$ are more productive in job 1 and workers with ability $\eta_i > \eta^*$ are more productive in job 2.

The employer could learn gradually about the worker's effective ability from noisy observations, without any training. Eventually, a worker's labour market experience rises to a sufficiently high level that expected ability increases beyond η^* and it is optimal to promote a worker from job 1 to job 2.

However, the firm could alternatively select those workers it perceives as potentially benefiting from training. Through the training process the worker augments her human capital and the firm observes the suitability of the worker for job 2. Suppose without training it takes k years for a worker to reach η^* ability level and suppose further that the error term has variance v . If the training process reduces the risk of a poor job match, the variance attached to the effective ability level, as observed by the employer, is reduced to v' .⁷⁶ The employer incurs a cost of training C which is a function of innate ability θ and the stock of on the job training T . The

⁷⁶ See Owan (2004) for a model of promotion where the worker's ability is distinguished from the quality of job match. That is, a worker can have high ability but low quality job match.

employer can equate the marginal benefit of training to the marginal cost ($\partial f/\partial T = \partial C/\partial T$) but there are other benefits to training which should also be accounted for. Essentially, the firm trades off the higher probability of an incorrect match and the length of time that a bad match persists, which combine to cause output to be less than optimal, against expenditure on training. Training lowers the variance of expected output since it enables the employer to promote a worker with lower variance of expected ability and the probability of incorrectly promoting a worker of lower effective ability will be reduced.

Training also has the advantage for the employee of reducing the length of time needed to reach the critical ability level η^* which would trigger promotion. There is the disadvantage for the worker that a firm will choose to train more than one worker to fill one promotion vacancy and will then generate a tournament to select the best worker.

In this setting, promotions offer an incentive to work harder. In the limit, if promotions were *solely* determined by effort incentives then effort (proxied by variables such as amount of overtime worked (as in Landers *et al* 1996) would be a significant determinant of promotion while training would be unimportant. The worker's choice of participation in a training competition will depend both on self-belief about one's own ability and the worker's belief about the credibility of the firm's promotion promise. Essentially, the worker needs to believe that the mechanisms by which the worker reveals the benefits of training to the firm are interpreted identically by the employer, and that subjective elements of discrimination and favouritism do not intrude (Prendergast, 1999).

Another role played by promotion is noted by Bernhardt (1995). The training activity provided by one firm can be observed by other firms. This allows all firms, not just the incumbent, to update the value of an employee's expected productivity – at least under the assumption that some component of the training is actually general or transferable. Bernhardt (1995) points out that the firm investing in training can protect its investment by following it with a promotion. Promotions can ward off employee poaching / raiding and decrease the attractiveness of recently trained employees by signalling to other firms that there is reaffirmed commitment from the incumbent firm to utilise its trained workforce. At the same time, promotion could also prevent the newly trained employees from moving to rival firms, by reducing the probability of a voluntary quit to seek better external opportunities.

The theoretical contributions above are used as the main tools to conceptualise the intricate links between training and promotion. For instance, using the model offered by Gibbons and Waldman (1999), for a worker i who has innate ability θ_i determined *inter alia* by education and is observable to the firm, the effective ability in period t is given by a random effects model:

$$\eta_{it} = \theta_i f(x_{it}, T_{it}) + \xi_{it}$$

where:

x_{it} = labour market experience;

T_{it} = the stock of on the job training; and

ξ_{it} = an i.i.d random error.

Similarly, a fixed effects estimation of wage in this chapter attempts to measure the impact of the stock of training and of tenure on earnings – the latter being, conceivably, related to worker’s ability.

To conclude, the studies discussed in this section serve as the conceptual basis for this chapter. Additionally, they support and highlight the need for more empirical investigation into training and promotion. This chapter attempts to do just that.

5.3. Data, hypotheses and econometric estimation

This section implements the suggestions from the literature and theoretical framework. It presents the data and variables used in this chapter, followed by the methodology used, namely the econometric estimation of training, promotion and wages.

5.3.1. Data and hypotheses

The British Household Panel Survey has been conducted annually in Britain since 1991 as a multi-purpose panel study.⁷⁷ It is a household based survey, interviewing each adult member of the sampled households, which then generates a

⁷⁷ Studies that have used the BHPS for the analysis of training are Booth and Bryan (2002), Booth *et al* (2003), Melero (2004), Almeida-Santos and Mumford (2005 and 2006). Studies that have used the BHPS for the analysis of promotion are Francesconi (2001), Booth *et al* (2003) and Melero (2004). For further studies using the BHPS: http://www.iser.essex.ac.uk/ulsc/bhps/doc/vola/app5_2.php

representative sample of around 5,000 individuals followed yearly.⁷⁸ The sample obtained is a stratified clustered design based on the Postcode Address File. All individuals present at those addresses in 1991, at the first wave, were considered panel members.

This chapter uses the first 13 waves covering the period from 1991 to 2003. Statistical software (*Stata 7*) is used to obtain a panel of individuals that incorporates spells of employment. Only individuals in paid employment and with age between 16 and 65 are kept in the panel. The final sample consists of 60,253 observations (spells of employment) containing information mainly based on the BHPS employment sections which record multiple spells for each of the 10,763 individuals observed over the period of 13 years (waves A to M). These 13 datasets have been merged based on the personal identifier, and the employment history records have also been merged to generate a single dataset. The resulting panel is an unbalanced panel, because individuals are being observed coming in and out of employment for a different number of times during the 13 year observation period. More than three quarters (78%) of the observations in this sample come from individuals with 6 or more spells of employment. The data may also be described as rather dense, in that there is a frequent succession of spells per individual. As such, of any two consecutive spell of employment, less than 100 spells have a gap of more than 6 years, and most (over 90%) gaps are of less than 2 years. Appendices D.3 and D.4 offer a brief first insight into this panel, by presenting numbers and percentages

⁷⁸ At three points in time (1999, 2000 and 2001), the sample has been increased by the addition of households from Scotland, Wales and Northern Ireland. However, the necessary condition of consistency with previous waves meant that these additions were dropped from the panel generated for the purpose of this chapter.

associated with the split of the sample according to gender, sector and whether the employment is in professional or non-professional occupations.

Based on the literature on training and promotion reviewed above, and on the theoretical model exposed in the previous subsection, this chapter tests four hypotheses, as follows:

- *Hypothesis 1:* Employers offer training to those whom they intend to promote, therefore the probability of recent training (and the number of training episodes) is a reflection of the incidence of promotion. There is expected to be a positive and significant relationship between the probability of being trained at present, , and the history of training and promotion episodes.
- *Hypothesis 2:* Employers use training as a filter for searching for promotable employees, therefore the probability of being promoted is higher after training. Recent training has a positive and statistically significant impact on the likelihood of being promoted.
- *Hypothesis 3:* The occurrence of training has a positive and statistically significant effect on the level of wages.
- *Hypothesis 4:* The occurrence of promotion has a positive and statistically significant effect on the level of wages.

Three dependent variables are generated for recent training with current employer, recent promotion with current employer, and for weekly wages. With respect to training, respondents are asked whether they had received work-related

training in the previous year.⁷⁹ Initially, the dichotomous variable *Training dummy* is coded 1 if a respondent received any form of work-related training in the period elapsed from last interview. Based on the same question, the stock of training up to present spell is also measured in this chapter by the variable *Total Trained t-1*. It is to be noted that the letter *t* denominates spells of employment, that is an episode of employment, and not years. Then, using the information on whether the respondent has changed employer, the dependent variable for training *Training with same employer spell t* is created, encoded to take the value 1 if such training has occurred. Table 5.1 shows the distribution of observations according to the incidence of training. The distribution is rather equal by gender, however, those in professional occupations tend to have almost twice as much training than those in non-professional occupations.

Table 5.1. Incidence of recent training with current employer, by absolute number and percentage in the respective category

	In Dataset		Trained with current employer	
	N	%	N	%
Male	29,638	49.19	9,045	30.52
Female	30,615	50.81	9,584	31.30
Private sector	41,882	69.51	10,654	25.44
Professional occupations	21,227	35.23	9,105	42.89
Nonprofessional occupations	39,026	64.77	9,524	24.40

⁷⁹ The exact question asked is: "Since September 1st last year, have you taken part in any training as part of your present employment?". More than one variable is used to encode training, with particular attention paid to the fact that for years 1991-1997 (waves A-G) training is encoded differently than for years 1998 -2003 (waves H-M).

Two additional training variables are generated in order to distinguish between training provided by the current employer and by previous employers: *Training with same employer in spell t* and *Training with previous employer in spell t*. In turn, for each of the latter two variables, the following training variables lagged by one or two employment spells are generated: *Training with same employer in spell t-1*, *Training with same employer in spell t-2*, respectively *Training with previous employer in spell t-1*, *Training with previous employer in spell t-2*.

With respect to promotion, each year individuals are asked if they changed their job in the period elapsed from the last interview and, if so, the reasons for this.⁸⁰ ‘Promotion with current employer’ is one reason given for a job change, so the binary variable, *Promotion dummy*, takes the value of 1 where this is observed. The same approach - described for training variables in the paragraph above, whereby the information of whether the person changed employer or not was used for training variables - applies to the generation of promotion variables. Hence, the dependent variable for promotion is *Promotion with same employer (in) spell t*, encoded to take the value 1 if such promotion has occurred. Table 5.2 shows that the distribution of employees according to promotion as the dependent variable, with females receiving slightly less promotions than males, and with professional occupations receiving almost three times as much promotion than non-professional occupations.

⁸⁰ The exact question asked is: “Would you look at this card and please tell me which of the statements on the card best describes why you stopped doing that job?”, and the variable for promotion is obtained from the answer “was promoted”. This question was asked consistently from 1991 – 2003 (waves A-M). On the interview card, the other reasons for stopping the previous job were: “left for better job”, “made redundant”, “dismissed or sacked”, “temporary job ended”, “took retirement”, “stopped for health reasons”, “left to have a baby”, “children/ home care”, “care of other person”, or “other reasons”.

Table 5.2. Incidence of recent promotion with current employer, by absolute number and percentage in the respective category

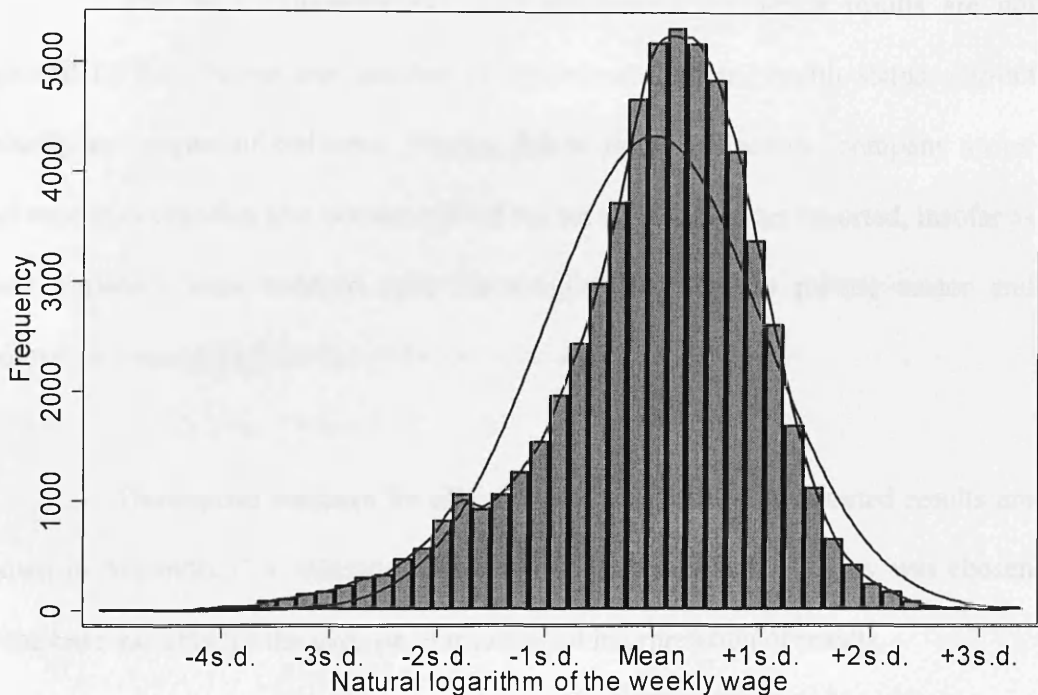
	In Dataset		Promoted with current employer	
	N	%	N	%
Male	29,638	49.19	2,005	6.67
Female	30,615	50.81	1,668	5.45
Private sector	41,882	69.51	2,633	6.29
Professional occupations	21,227	35.23	2,203	10.38
Nonprofessional occupations	39,026	64.77	1,407	3.77

It should be stressed that previous employment spells could be with the same employer if the worker takes a break from current job in order to return later. For instance, women who take maternity leave and return to employment are treated as having a new employment spell by the BHPS. Therefore, for the purpose of this study, there would be cases where the “previous employer” is in fact the same employer to whom the respondent returns after a break in employment. To minimise the bias that occurs, the solution adopted in this study was to encode the variable ‘change of employer’ (used at subsequent stages to encode the dependent variables) by also taking into account the change in occupation. This way, the bias only persists in the very unlikely case that employees return to work with the same employer, and immediately change occupation. In this situation (for less than 1% of respondents), the current employer is misleadingly encoded as being a ‘previous’ employer.

The third dependent variable is the natural logarithm of real weekly earnings. The BHPS records the wage as a continuous variable as usual gross pay per month. Using the consumer price indices available from the Office of National Statistics for years 1991 - 2003, a variable for the real weekly wage has been

generated so that wage is measured at constant prices overtime, and its natural logarithm is used in this study. Figure 5.1 presents the frequency distribution for the natural logarithm of wages, which is slightly skewed to the left.

Figure 5.1: Frequency distribution for the natural logarithm of real weekly wages⁸¹



The BHPS also contains information on person, job and firm characteristics, and measures of these indicators are used as control variables in all econometric analysis. For reasons to do with space limitations and relevance, out of the range of characteristics available, only the following controls have been reported in this chapter's tables (see Tables 5.3 to 5.7): age, gender, marital status, highest educational qualification, company size by number of employees, employee union

⁸¹ In this figure, for comparison, the normal and the kernel-density distributions are overlaid using the two continuous bell-shaped curves. This figure shows how the distribution of the natural logarithm of weekly wages compares to the normal and the kernel-density distributions, which is informative in determining the choice of econometric methodology. In this study, the wage distribution is only slightly skewed to the left, so no special precautions need to be taken in the use of the econometric methodology chosen.

membership status, type of job contract (whether full-time or part-time; as well as whether permanent, temporary or fixed-term), number of hours normally worked per week, number of overtime hours worked per week, and tenure with the firm (in weeks).

The set of characteristics used as controls for which results are not reported in this chapter are: number of dependent children, health status, current industry and region of residence. Finally, due to multi-collinearity, company sector and current occupation also became part of the set of variables not reported, insofar as these variables were used to split the sample according to private sector and professional occupation.

Descriptive statistics for all variables in the tables of reported results are shown in Appendix D.5, indicating for control variables which category was chosen as the base variable for the purpose of meaningful interpretation of results.

5.3.2. Econometric methodology

To test the set of hypotheses highlighted above, this chapter builds probit, bivariate probit and fixed effects models with training, promotion and real wage as dependent variables.⁸²

5.3.2.1 Recent training and promotion with current employer – two separate models

Firstly, the starting assumption is that training and promotion are independent variables, exogenously determined. To test *Hypotheses 1* and *2* for training and promotion, marginal effects from a probit model are estimated.

Following Maddala (1983) and Wooldridge (2001), a probit model is an econometric model based on the generalised linear model (GLM), where the dependent variable y_{it} (i is the individual subscript and t is the time subscript) can be only one or zero, and the continuous independent variables forming a vector of regressors b' are estimated using the probit function:

$$\Pr (y_{it} = 1) = F (b' x_{it}) \quad (\text{Probit Model Equation})$$

where:

b' = parameters to be estimated; and

F = the normal cumulative distribution function.

⁸² The choice of a random as opposed to a fixed effects model is made after performing a standard Hausman test. The result of this test favoured a fixed effects model over a random effects model.

The probit model assumes that there is an underlying, latent response variable, y_{it}^* , which in this chapter represents the probability of being trained with the current employer (in the probit model for training), and the probability of being promoted with the current employer (in the probit model for promotion). The latent variable y_{it}^* can be expressed as:

$$y_{it}^* = b'x_{it} + u_{it}$$

where:

x_{it} = a set of exogenous variables affecting the probability of being trained / promoted with the current employer;

b' = parameters to be estimated; and

u_{it} = a stochastic error term.

In practice, y_{it}^* is unobserved. Instead, a dummy variable y is observed,

where:

$y = 1$ if $y_{it}^* > 0$, that is, for observation i training / promotion occurs; and

$y = 0$ otherwise, that is, for observation i there is no training / promotion with the current employer.

It follows that:

$$\text{prob}(y_{it} = 1) = \text{prob}(u_{it} > -b'x_{it})$$

Therefore:

$$\text{prob}(y_{it} = 1) = 1 - F(-b'x_{it}) \quad (\text{Probabilities Equation})$$

where F is the standard normal cumulative distribution function, and the observed values of y are the outcomes of a binomial process estimated via the *Probit Model*

Equation. The probabilities of these outcomes are generated by the *Probability Equation* and are dependent on the vector of exogenous regressors x_i .

The following two independent probit models are estimated in this chapter in order to investigate the determinants of training and promotion. Firstly, in order to investigate the probability of being trained:

$$\text{Training with current employer}_{it} = \alpha_1 + \alpha_2 \text{Individual}_{it} + \alpha_3 \text{Education}_{it} + \alpha_4 \text{Job}_{it} + \alpha_5 Z_{\text{training } it} + \alpha_6 \text{Year} + \varepsilon_{\text{training } it} \quad (1)$$

Secondly, in order to analyse the probability of being promoted:

$$\text{Promotion with current employer}_{it} = \beta_1 + \beta_2 \text{Individual}_{it} + \beta_3 \text{Education}_{it} + \beta_4 \text{Job}_{it} + \beta_5 Z_{\text{promotion } it} + \beta_6 \text{Year} + \varepsilon_{\text{promotion } it} \quad (2)$$

In both equations (1) and (2) above, the following notations are used:

i = individual employee subscript

t = time subscript

F = the standard normal cumulative distribution function;

Individual = a vector of personal characteristics including age and its square; whether divorced, widowed or not married; whether in reasonable health; a dummy for smoking; and number of dependent children;

Education = a dummy variable for level of education, with highest education level as O-level qualifications as baseline category, as well as including a dummy for national vocational qualifications;

Job = a vector of work history variables including tenure with current employer, union membership, standard industry category, standard occupation category, whether in temporary or fixed-term contract, and whether in part-time work;

Z_{training} ($Z_{\text{promotion}}$) = a vector of variables, which includes for the training equation (respectively for the promotion equation) the following variables: incidence of recent promotion (training); lagged training with same employer; lagged training in previous employment spells; lagged promotion with same employer; and lagged promotion in earlier employment spells. Equations (1) and (2) are also each estimated with their associated interaction variable, to check for interaction effects between tenure and the dependent variable. These interaction variables are generated as the product of variables *Training dummy* * *Tenure*, and *Training dummy* * *Promotion* respectively.

Year = a set of dummy variables controlling for the year when the spell of employment occurred; and

$\epsilon_{\text{training}}$ ($\epsilon_{\text{promotion}}$) = the error terms.

To ease the interpretation of results, the estimated report marginal effects from the probit models are reported i.e. the change in the probability for an infinitesimal change in each independent, continuous variable and, by default, the discrete change in the probability for dummy variables.

5.3.2.2. The interdependence between recent training and promotion with current employer

So far, the analysis has ignored model specification problems related to the interdependence of the probabilities of training and promotion. The two univariate equations (1) and (2) have been estimated by individual single equation probit methods. In order to check whether recent training and promotion are simultaneously determined, or whether training may be endogenous to our other covariates, the assumption of exogeneity is changed to allow for the possibility that training is endogenous. In this way, this chapter assesses whether the probability of training is related to the incidence of promotion (*Hypothesis 1*). Moreover, it tests whether employers cherry pick their employees by training those whom they intend to promote (*Hypothesis 2*).

A bivariate probit model (see Greene 2000) fits maximum-likelihood two-equation probit models for two dependent variables y_{1j} and y_{2j} , where y^*_{1j} and y^*_{2j} are the unobserved latent variables. We observe instead $y_{ij} = 1$ if $y^*_{ij} > 0$, and $y_{ij} = 0$ otherwise (for $i = 1, 2$). The derivation equations for the latent variables assume that:

$$\begin{cases} y^*_{1j} = a x_j + e_{1j} + \text{offset}^a_j \\ y^*_{2j} = b z_j + e_{2j} + \text{offset}^b_j \end{cases}$$

where:

$$E(e_{1j}) = E(e_{2j}) = 0$$

$$\text{Var}(e_{1j}) = \text{Var}(e_{2j}) = 1$$

$$\text{Cov}(e_{1j}, e_{2j}) = \rho$$

If the correlation term $\rho = 0$, then the training and promotion are independent and there would be no reason to run a bivariate probit. However, if the correlation term ρ is different than zero, a bivariate probit model is characterised by greater efficiency than univariate probit models, since the bivariate probit implies that training and promotion are jointly determined. The correlation term ρ gives a measure of the way in which the unobservable factors not captured in the regression influence training and promotion.

The correlation terms ρ for the bivariate probit models estimated in this study are shown in Tables 5.5 and 5.6 at the end of this chapter. Since all ρ terms are significantly not equal to zero, this suggests that training and promotion are interdependent, rather than the results of independent processes. Since all ρ terms are positive, this suggests that training and promotion are influenced by the unobservable factors in the same direction.

Thus, equations (1) and (2) are estimated together via a bivariate probit model of training and promotion, as follows:

$$\left\{ \begin{array}{l} \textit{Training with current employer}_{it} = \alpha_1 + \alpha_2 \textit{Individual}_{it} + \alpha_3 \textit{Education}_{it} + \alpha_4 \textit{Job}_{it} \\ + \alpha_5 \textit{Z}_{\textit{training } it} + \alpha_6 \textit{Year} + \varepsilon_{\textit{training } it} \end{array} \right. \quad (1)$$

and:

$$\left\{ \begin{array}{l} \textit{Promotion with current employer}_{it} = \beta_1 + \beta_2 \textit{Individual}_{it} + \beta_3 \textit{Education}_{it} + \beta_4 \\ \textit{Job}_{it} + \beta_5 \textit{Z}_{\textit{promotion } it} + \beta_6 \textit{Year} + \varepsilon_{\textit{promotion } it} \end{array} \right. \quad (2)$$

It is assumed that the error terms $\varepsilon_{\textit{training } it}$ and $\varepsilon_{\textit{promotion } it}$ are the stochastic disturbance terms in each equation with $\varepsilon_{\textit{training } it}$, $\varepsilon_{\textit{promotion } it}$

$\sim N(0,0,\sigma_{1it}^2,\sigma_{2it}^2,\rho)$ where the covariance is given by $\sigma_{1it,2it} = \rho\sigma_{1it}\sigma_{2it}$. In the bivariate model, the disturbance terms, $\varepsilon_{\text{training } it}$ and $\varepsilon_{\text{promotion } it}$ are jointly normally distributed with variances σ_{1it} and σ_{2it} .

The bivariate model specification replicates the separate probit models outlined above at Section 5.3.2.1. The *Stata* command used is *biprobit*. The bivariate model has been estimated both with and without interaction variables for *Training dummy * Tenure*, and respectively for *Promotion dummy * Tenure*. Since they were found to be statistically insignificant, the results reported in this chapter are from models that do not include interaction variables, and it can be concluded that there is no reason to assume tenure could be a discriminating basis for determining opportunities for training and promotion.

5.3.2.3. The effect of recent training and promotion with current employer on wages

The fixed effects estimator is obtained by ordinary least square (OLS) estimations based on the deviations from the means of each unit over time in a panel dataset. This approach is particularly relevant for panel datasets consisting of multiple “waves” (points in time when information is collected; a “wave” can be thought of as being a cross-section dataset), and in particular when there are expectations that the averages of the dependent variable will be different for each cross-sectional unit (in this study, the employee), or each time period (in this study, the spell of employment), but the variance of the errors will not be different.

The model formulation is based on the assumption that differences across real wage observations can be captured by differences in the coefficients of the independent and control variables (Gujarati 2003). Therefore, while the intercept may differ across individuals, each individual's intercept is time invariant. The equation for this model is:

$$y_{it} = (a + v_i) + b' x_{it} + u_{it} \quad (\text{Fixed Effects Equation})$$

where:

i = the i^{th} cross-sectional unit, that is, the personal identifier (pid);

t = the t^{th} time period;

y_{it} = dependent variable, that is, natural logarithm of real weekly wage at current prices

$a + v_i$ = the fixed effects to be estimated;

b' = parameters to be estimated;

x_{it} = vector of regressor (independent and control variables), that is training / promotion with current employer; and

u_{it} = a stochastic error term. The assumptions made about the error terms are that they are fixed parameters following $E(u_{it}) \sim N(0, \sigma^2)$.

The remaining two hypotheses, *Hypotheses 3* and *4* relate to the effect of recent training and promotion on individual earnings. Therefore, bivariate probabilities of promotion and training are imbedded in wage equations. This captures both the interdependence and endogeneity of training and promotions within a model of wage determination.

Two standard Mincerian wage equations (Mincer 1974) are estimated with probability of promotion and training as covariates, as follows:

$$\begin{aligned} \text{LnWage}_{it} = & b_1 + b_2 \textit{Training with current employer}_{it} + b_3 \textit{Individual}_{it} + \\ & b_4 \textit{Education}_{it} + b_5 \textit{Job}_{it} + b_6 \textit{Z}_{it} + u_{it} + v_i \end{aligned} \quad (3)$$

and

$$\begin{aligned} \text{LnWage}_{it} = & b_1' + b_2' \textit{Promotion with current employer}_{it} + b_3' \textit{Individual}_{it} + \\ & b_4' \textit{Education}_{it} + b_5' \textit{Job}_{it} + b_6' \textit{Z}_{it} + u_{it} + v_i \end{aligned} \quad (4)$$

where:

i = employee subscript

t = period of time

LnWage_{it} = natural logarithm of real weekly earnings;

b and b' = parameters to be estimated;

Variables (Training with current employer, Promotion with current employer

Individual, Education, Job, Z) = the independent and control variables replicating

those described in Section 5.3.2.1 as well as variables measuring the accumulation of training and promotion;

u_{it} = a stochastic error term; and

v_i = the fixed effects to be estimated.

Besides introducing training and promotion as dummy variables in the equations (3) and (4), the two wage equation estimations above also attempt to take into account the stock of training and promotion by including in the models the variables *Total Trained t-1* and *Total Promoted t-1*. These two variables offer a simple

additive measure of the total number of years in the sample for which training and promotions have occurred.⁸³

All models are estimated at three levels:

- (a) data is split by gender, in order to assess whether there is discrimination in training and promotion; then
- (b) within each gender, data is split by sector, into private or public, due to the very different forces at play in the private as opposed to the public sector; and then
- (c) within each gender, data is split by occupation, into professional and non-professional, due to different labour market characteristics of professional vs. non-professional jobs.

Moreover, all models are also estimated with the option of clustering by the variable containing the cross-wave *personal identifier (pid)* in order to obtain robust standard errors. This method ensures that observations are treated as independent across waves only if they do not represent repeated observations on the same individual.

⁸³ A proxy for the total stock of training is needed since any prior training should augment human capital and be reflected in the wage (Pischke 2001, Almeida-Santos and Mumford 2006, Ariga and Brunello 2006). A proxy for the total stock of promotion is also needed since any prior promotions may signal increased worker ability, and lead to higher wages.

5.4. Discussion of results

This section presents the results estimated in Tables 5.3-5.7 in this order, with results highlighted in bold where they represent values discussed within the text. It starts with two probit models analysing the determinants of training (Table 5.3) and promotion (Table 5.4). It continues with the discussion of the bivariate probit model assessing the link between training and promotion (Table 5.5). It ends with the results from the fixed effects wage models for training (Table 5.6) and for promotion (Table 5.7). Full tables can be found at the end of the chapter and the most relevant parts of the Tables are provided in the main text alongside the respective discussion of results.

A common structure is shared by all table columns, stemming from the way the data is split by gender, sector and occupation. Models are estimated in the first instance for all workers, but throughout, the data is split by gender. Secondly, the data is split by sector, and results are shown for the private sector. In the end, the estimations are separated by occupational sector, with results reported for both professional and non-professional occupations. The term ‘professional occupation’ is used in this chapter to refer to those categories of jobs classified in the Standard Occupational Classification used by BHPS as being amongst the following three: (1) managers and administrators; (2) professional occupations; or (3) associate professional and technical occupations.⁸⁴ The assumption behind this occupational split is that professional jobs require the acquisition of a relatively higher level of skills, and that training and promotion issues within these jobs are of a relatively different nature compared to non-professional occupations.

⁸⁴ The BHPS uses the Standard Occupational Classification 1992, available at: http://www.iser.essex.ac.uk/ulsc/bhps/doc/vola/app3_2.php

5.4.1. The determinants of training and promotion – two separate models

Tables 5.3 and 5.4 report marginal effects, P-values and robust standard errors from the separate probit equations (1) and (2) above, with dependent variables *Training with same employer t* and *Promotion with same employer t* respectively.

By looking at the first row in Tables 5.3a and 5.3b, it is clear that training and promotion with the same employer are positively associated (*Hypothesis 1*). Promotion with the same employer is related to training with the same employer with marginal effects between 18 percentage points (pp) for male non-professionals and almost 30 for female professionals, meaning employers tend to offer the two to the same employees. This result is also enhanced by the fact that for all categories of employees the interaction variables *Training dummy*tenure* and *Promotion dummy*tenure* enter as highly significant in relation to promotion, and respectively for training, thus re-confirming the link between training and promotion.⁸⁵

Table 5.3a. Probit marginal effects:

Determinants of recent training with current employer for male employees (table partially presented here –full table is shown at the end of the chapter)¹

	All		Private sector		Professional		Non-professional	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Promotion with same employer in spell t	0.208 (0.020)	0.000	0.205 (0.022)	0.000	0.224 (0.026)	0.000	0.179 (0.030)	0.000

¹ Columns (1) contain marginal effects, with standard errors in brackets. Columns (2) contain p-values. Estimations are adjusted for clustering by individual.

⁸⁵ With the exception of the estimate for *Promotion dummy*Tenure* for non-professional males, which is has a value just above borderline significance.

Table 5.3b.

Probit marginal effects:

Determinants of recent training with current employer for female employees
(table partially presented here –full table is shown at the end of the chapter)

	All		Private sector		Professional		Non-professional	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Promotion with same employer in spell t	0.286 (0.021)	0.000	0.229 (0.026)	0.000	0.292 (0.026)	0.000	0.246 (0.031)	0.000

See footnotes to Table 5.3a.

Similar to Tables 5.3a and 5.3b, the first row in Tables 5.4a and 5.4b also shows that training and promotion with the same employer are interlinked, except that marginal effects are smaller here, between 5 pp (for male non-professionals) and almost 10 pp (for male professionals).

Table 5.4a. Probit marginal effects:Determinants of recent promotion with current employer for male employees
(table partially presented here –full table is shown at the end of the chapter)

	All		Private sector		Professional		Non-professional	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Training with same employer in spell t	0.064 (0.005)	0.000	0.069 (0.006)	0.000	0.101 (0.010)	0.000	0.045 (0.006)	0.000

See footnotes to Table 5.3a.

Table 5.4b. Probit marginal effects:Determinants of recent promotion with current employer for female employees
(table partially presented here –full table is shown at the end of the chapter)

	All		Private sector		Professional		Non-professional	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Training with same employer in spell t	0.056 (0.005)	0.000	0.060 (0.006)	0.000	0.093 (0.009)	0.000	0.041 (0.005)	0.000

See footnotes to Table 5.3a.

Although timing and causation remain unresolved, in that the BHPS dataset does not allow for a distinction between the timing of the training and promotion episodes with current employer, this is a preliminary indicator of cherry-picking behaviour by employers (*Hypothesis 2*). Even if employers train workers *after* promotion, it remains the case that workers who have been selected for training are those who have demonstrated suitability for promotion, whether considered in terms

of absolute ability or quality of job match. For both men and women, the extent of correlation between promotion and training is greater for professional employees than for non-professionals.

The models estimated in Tables 5.3 (and 5.4) also include a selection of lagged variables for training (and promotion). These distinguish between current and previous employer-provided training (promotion). As such, one lagged variable refers to a period between the 1st and the 2nd previous spells of employment (lag t-1), and the second lagged variable refers to a period between the 2nd and the 3rd previous spell of employment. For a visual explanation of how the spells relate to time, see Appendix D.4.

Continuing the analysis of results in Table 5.3, the set of lagged variables related to training shows that prior training, irrespective of whether it is with the previous or current employer, is a precursor of current training. This result suggests that a first training episode could start a virtuous cycle of learning. An interpretation would be that as the benefits of training are experienced, and as they reward the incumbent for the effort deployed during training via increased productivity, this positive experience would give the incumbent not only the reinforcement of higher wages (assumed in case productivity were to translate into higher wages), but also an incentive for further knowledge accumulation. Thus, training generates further training.

Table 5.3a. Probit marginal effects:
Determinants of recent training with current employer for male employees
(table partially presented here –full table is shown at the end of the chapter)

	All		Private sector		Professional		Non-professional	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Training with same employer in spell t-1	0.246 (0.008)	0.000	0.238 (0.009)	0.000	0.270 (0.011)	0.000	0.227 (0.010)	0.000
Training with same employer in spell t-2	0.087 (0.008)	0.000	0.079 (0.009)	0.000	0.111 (0.013)	0.000	0.069 (0.010)	0.000
Training with previous employer in spell t-1	0.222 (0.018)	0.000	0.195 (0.019)	0.000	0.285 (0.026)	0.000	0.171 (0.022)	0.000
Training with previous employer in spell t-2	0.052 (0.017)	0.002	0.053 (0.019)	0.003	0.045 (0.030)	0.120	0.060 (0.021)	0.003

Notes: Columns (1) contain marginal effects, with standard errors in brackets. Columns (2) contain p-values. Estimations are adjusted for clustering by individual.

Table 5.3b. Probit marginal effects:
Determinants of recent training with current employer for female employees
(table partially presented here –full table is shown at the end of the chapter)

	All		Private sector		Professional		Non-professional	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Training with same employer in spell t-1	0.221 (0.007)	0.000	0.191 (0.010)	0.000	0.235 (0.012)	0.000	0.208 (0.009)	0.000
Training with same employer in spell t-2	0.093 (0.008)	0.000	0.079 (0.010)	0.000	0.120 (0.014)	0.000	0.081 (0.010)	0.000
Training with previous employer in spell t-1	0.215 (0.017)	0.000	0.210 (0.020)	0.000	0.182 (0.025)	0.000	0.234 (0.021)	0.000
Training with previous employer in spell t-2	0.071 (0.017)	0.000	0.035 (0.019)	0.054	0.063 (0.028)	0.025	0.080 (0.021)	0.000

See footnotes to table 5.3a.

Most notably, the probability of training increases if the previous training episode was with the current employer, a variable which is a strong predictor of recent training. Marginal effects for men are between 22 pp and 27 pp, and between 19 pp and 23 pp for women.

Despite not being able to ascertain from the data whether training is general or specific, if training were assumed to be general, the impact on training incidence of the past training episodes would not be expected to depend on whether these episodes were provided by the current or by the previous employer. This assumption is not supported by the evidence shown in Table 5.3 for men and women: training with previous employer has a significant impact on recent training. Out of the six split levels investigated, at three levels (male in the private sector, non-professional male, and women working in professional occupations), some marginal effects related to the the impact on recent training of training with the previous employer (in either spell $t-1$ or $t-2$) are slightly smaller than the impact of training with the current employer. However, at the other three levels of data split (professional male, women in the private sector and women working in non-professional occupations) the reverse is true, though the differences are sometimes small. For these latter categories, training incidence is rather more correlated to a training episode with the previous employer ($t-1$) than with the current employer, hence, to a certain small extent, a sequence of training episodes is rather more likely than a single training episode. An alternative explanation for the results obtained with respect to employees in the latter three categories, could be that their training contains a relatively slightly larger proportion of general training than for the rest of the employees – in particular, this could be the case of non-professional women.

Marginal effects reported for men with regard to their training episodes (Table 5.3a) are not consistently different than those reported for women (Table 5.3b). This can be interpreted as suggesting that a gender discrimination expectation (constructed merely based on the extant literature) with regard to the probability of

being trained is not supported by BHPS data. Unlike previous studies which found evidence that British women were disadvantaged with regard to training access (Booth 1991, Green 1991, Arulampalam and Booth 1997), Table 5.3 confirms the more recent results reported by Green and Zanchi (1997) who maintain that there has been convergence between genders with regard to training access in Britain.

Looking at the impact of promotion on recent training, prior promotions do not have a significant impact on recent training for men. Similarly, for women this impact is largely insignificant, and, if significant, the marginal effects are small.⁸⁶ Therefore, having been already promoted, employees are seen as less likely to need enhancement of skills. This is a result consistent across gender, sector and occupation, in support of the hypothesis that training is a precedent to promotion (*Hypothesis 1* and *Hypothesis 2*).

⁸⁶ The cases where the impact is significant are if women's prior promotion was with their previous employer, but this is highly significant to recent training for the private sector, and marginally significant in the non-professional occupations. On the contrary, for professional women, promotion with previous employer is only marginally significant.

Table 5.3a.⁸⁷ Probit marginal effects:
Determinants of recent training with current employer for male employees
(table partially presented here –full table is shown at the end of the chapter)

	All		Private sector		Professional		Non-professional	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Promotion with same employer in spell t	0.208 (0.020)	0.000	0.205 (0.022)	0.000	0.224 (0.026)	0.000	0.179 (0.030)	0.000
Promotion with same employer in spell t-1	0.009 (0.012)	0.458	0.002 (0.013)	0.888	-0.003 (0.017)	0.877	0.022 (0.019)	0.216
Promotion with same employer in spell t-2	-0.005 (0.013)	0.679	-0.001 (0.014)	0.963	-0.015 (0.018)	0.399	0.004 (0.019)	0.822
Promotion with previous employer in spell t-1	-0.003 (0.055)	0.949	-0.016 (0.061)	0.795	-0.020 (0.077)	0.797	-0.000 ⁸⁸ (0.086)	0.998
Promotion with previous employer in spell t-2	-0.053 (0.057)	0.382	-0.049 (0.061)	0.458	-0.113 (0.077)	0.172	0.028 (0.090)	0.750
Interaction promotion*tenure	0.00027 (0.000)	0.000	0.00026 (0.000)	0.001	0.00034 (0.000)	0.001	0.00016 (0.000)	0.115

See footnotes to table 5.3a.

Table 5.3b. Probit marginal effects:
Determinants of recent training with current employer for female employees
(table partially presented here –full table is shown at the end of the chapter)

	All		Private sector		Professional		Non-professional	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Promotion with same employer in spell t	0.286 (0.021)	0.000	0.229 (0.026)	0.000	0.292 (0.026)	0.000	0.246 (0.031)	0.000
Promotion with same employer in spell t-1	0.015 (0.013)	0.246	0.043 (0.015)	0.003	0.002 (0.021)	0.908	0.029 (0.017)	0.082
Promotion with same employer in spell t-2	-0.019 (0.014)	0.181	-0.014 (0.015)	0.361	-0.015 (0.022)	0.497	-0.021 (0.017)	0.235
Promotion with previous employer in spell t-1	0.083 (0.051)	0.089	0.031 (0.057)	0.578	0.137 (0.076)	0.078	0.048 (0.063)	0.425
Promotion with previous employer in spell t-2	-0.003 (0.049)	0.953	-0.019 (0.059)	0.752	-0.079 (0.068)	0.252	0.077 (0.074)	0.259
Interaction promotion*tenure	0.00157 (0.000)	0.000	0.00039 (0.000)	0.000	0.00174 (0.000)	0.000	0.00036 (0.000)	0.001

See footnotes to table 5.3a.

⁸⁷ Columns (1) contain marginal effects, with standard errors in brackets. Columns (2) contain p-values. Estimations are adjusted for clustering by individual.

⁸⁸ Results are estimated to 3 digits, with further digits only added if P-value < 0.100. For instance, this is the case with the interaction variable *promotion*tenure*.

The reported results for control variables show that age (modelled in a quadratic form) only appears to be significant for men's training if they are not split by occupation or sector. Overall, men have a higher probability of being trained as they advance in their careers but marginal effects are less than 1 pp. Marital status also only impacts on men's probability of training, with non married, single or widowed men being less likely to receive training than their married counterparts. This finding is consistent with the literature observing differences in labour market attachment with regard to marital status: married workers tend to have increased responsibilities and higher attachment to their work, hence they would have a higher probability of promotion. As signalled in the extant literature, education enters strongly significantly in both models for women and men. A possible anecdotal finding is that the category of employees most likely to receive training are those with higher education degrees who find themselves working in non-professional occupations (marginal effect 18 pp).⁸⁹

Of notable importance is the finding that lower education levels are negatively related to the probability of training, i.e. those with low educational attainment have a negative probability of training.⁹⁰ This reinforces the hypothesis that the lower skilled may find themselves trapped in a vicious cycle of learning (marginal effects for those with less than O level are bigger for men, at around 8 pp as opposed to around 6 pp for women). Tenure does not appear to have an impact on probability of being trained with current employer. However, this result could be

⁸⁹ This raises the issue of returns to education versus returns to training, an issue which has been considered beyond the scope of this study.

⁹⁰ In the American market, Finegold *et al* 2005 finds that educated and experienced individuals are more likely to be offered training, but lower-skilled individuals are more likely to take training when it is offered and spend more hours on it.

explained by the fact that the current spell of employment would by default imply that tenure had not yet been accumulated with the current employer. Overtime hours appear to be used as a signal by employers with regard to allocation of training to women. This is only the case for men in professional occupations. As a positive by-product of union membership, there is a strong positive correlation between being a union member and an increase in probability of being trained (marginal effects are around 5 pp across genders). This is consistent with some previous results in the literature (e.g. Acemoglu and Pischke 1998, Heyes and Stuart 1998). Similarly, the larger the company size, the higher the probability of being trained, probably since larger organisations can allocate more resources for this purpose. Working part-time is negatively associated with male training, but this result is smaller for females. Finally, working on temporary contracts appears to have a strong negative impact on training, with the largest impact out of all control variables (up to 18 pp for professional women) and irrespective of gender, sector or occupation. These findings are very much in line with the UK-based study by Sutherland (2004) who used the WERS 98 and finds, in contrast to Green (1999), that there are statistically significant differences between training incidence with respect to types of employment contract: those on a temporary or fixed term contract are 12 pp less likely to receive training than those on permanent contracts.

Turning to the determinants of promotion (Table 5.4), training offered in any two previous employment spells of the sample, either by current or previous employers, is either not significantly associated with male and female promotions or is correlated with a marginal effect of less than 3 pp. This suggests that it is the most recent training that is relevant for promotion, and reinforces the link between training

and promotion observed contemporaneously in both Tables 5.3 and 5.4. Firstly, an interpretation is that any prior training would already have been incorporated in earlier promotions. Hence, previous promotions (with current or previous employer) could be associated with recent promotion, but earlier training has a smaller effect. Secondly, it can be observed that, in spite of the small marginal effects, these results on training offer further support for the cherry picking hypothesis. This support is in the fact that there is consistency across gender, sector and occupation with regard to the significant positive association between training with the same employer 2 to 3 spells ago ($t-2$) and recent promotion, so employers seem to “cherry pick” by promoting those who have been trained (and, if employers can be assumed to carefully pre-plan the long-term training and promotion candidates, it could also seem that employers give preferential training treatment only to those employees whom they intend to promote).

Table 5.4a. Probit marginal effects:
Determinants of recent promotion with current employer for male employees
(table partially presented here –full table is shown at the end of the chapter)

	All		Private sector		Professional		Non-professional	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Training with same employer in spell t	0.064 (0.005)	0.000	0.069 (0.006)	0.000	0.101 (0.010)	0.000	0.045 (0.006)	0.000
Training with same employer in spell t-1	0.005 (0.003)	0.074	0.005 (0.003)	0.100	0.003 (0.006)	0.589	0.005 (0.003)	0.059
Training with same employer in spell t-2	0.014 (0.003)	0.000	0.017 (0.004)	0.000	0.022 (0.007)	0.001	0.010 (0.004)	0.002
Training with previous employer in spell t-1	0.000 (0.006)	0.958	0.005 (0.007)	0.428	-0.004 (0.014)	0.786	0.000 (0.006)	0.990
Training with previous employer in spell t-2	0.004 (0.007)	0.509	0.004 (0.007)	0.526	0.028 (0.017)	0.065	-0.008 (0.006)	0.247
Promotion with same employer in spell t-1	0.066 (0.007)	0.000	0.060 (0.008)	0.000	0.089 (0.012)	0.000	0.068 (0.011)	0.000
Promotion with same employer in spell t-2	0.013 (0.006)	0.008	0.013 (0.006)	0.017	0.021 (0.011)	0.043	0.017 (0.008)	0.009
Promotion with previous employer in spell t-1	0.041 (0.030)	0.088	0.031 (0.034)	0.259	0.020 (0.046)	0.643	0.088 (0.057)	0.014
Promotion with previous employer in spell t-2	-0.001 (0.020)	0.959	-0.010 (0.024)	0.711	-0.016 (0.033)	0.660	0.003 (0.037)	0.926
Interaction training*tenure	0.00011 (0.000)	0.000	0.00012 (0.000)	0.000	0.00019 (0.000)	0.000	0.00007 (0.000)	0.000

See footnotes to table 5.3a. Lag variables (t-1) and (t-2) have been checked for multi-collinearity and found not to be multi-collinear, which validates the current estimation format of the models including both lags.

An important result from Table 5.4a is that men are more likely to be promoted if they have been promoted up to two employment spells earlier (*Promotion with same employer t-1* has marginal effects between 6 and 9 pp), provided this promotion occurred with the current employer. A previous promotion with another employer, between one and two years ago, tends to be an inferior signal of worker ability and quality of job match compared to previous promotion with the current

employer. This signal being inferior shows that promotion with previous employer is not even significantly associated with current promotion, apart for males taken in general where it has a lower value of 4.1 pp compared with 6.6 pp for promotion with same employer in $t-1$. The main exception from previous promotion being an inferior signal are males in non-professional occupation: they are more likely to be promoted with the current employer if they have been promoted with the previous employer (8.8 pp) than if they have been promoted with the current employer (6.8 pp)

For men only, a promotion with the same employer even two to three spells of employment ago ($t-2$) remains positively associated with promotion. Hence, the signal offered by internal promotion is persistent. This is because promotion with the current employer two to three spells of employment ago, backed up by further tenure and experience with the firm, is regarded positively by the employer. Judging by a worker's tenure and experience, if the worker has shown loyalty and commitment to the firm, then promotions raise the quality of the job match or demonstrate the quality of the match. These results supply empirical support to the internal labour market theory which postulates that employers rely on internal job ladders to promote workers (Doeringer and Piore 1971).⁹¹

For female employees, there is somewhat weaker evidence of internal job ladders, with the exception of female professionals (marginal effect 5.8 pp, Table 5.4.b). These effects on promotion probabilities are overall smaller than those obtained for men. In terms of career advancement in the external labour market, this finding has implications for promotion for all employees, especially in the non-

⁹¹ This result goes against the findings from Grimshaw *et al* (2001) who analyse 4 large UK organisations and suggest that 'many of the "traditional" pillars of the internal labour market have been dismantled' (Grimshaw *et al* 2001 : 25).

professional occupations (maximum 8.8 pp for men in Table 5.4a, 7.5 pp for women in Table 5.4b). It could be argued that skills in these occupations are less firm-specific, more homogeneous and more general and transferable compared to professional occupations. Hence, promotion with a previous employer appears to give a similar signal of worker ability to promotion with the present employer. Promotion with a previous employer more than 2 spells of employment ago is not significantly correlated with promotion for both men and women, suggesting that employees should capitalise quickly on the higher status achieved after a promotion, as the value of their promotion depreciates fast and loses the potential to signal higher ability to their employers.

The interaction variable *training*tenure* is shown to be highly significant across genders, sectors and occupation. This provides further evidence in support of the hypothesis that employers cherry pick their workers.

A consistent difference between men and women is that Table 5.4b reports smaller marginal effects for women compared to Table 5.4a for men. This may be the result of other differences between genders affecting the way promotion is determined. For instance, less frequent employment spells for women may lead to effects of previous or current promotion and training episodes depreciating faster than for men.⁹² The difference between the marginal effects for men and women are smaller than 5 pp, a non-zero result which *can* be interpreted as evidence that women are discriminated against with regard to their promotion probability in current

⁹² Simple data tabulations in the panel provide some support to this suggestion.

employment. This estimate is in accordance with previous results reported by Francesconi (2001) and Booth *et al* (2003).

Table 5.4b. Probit marginal effects:
Determinants of recent promotion with current employer for female employees
(table partially presented here –full table is shown at the end of the chapter)

	All		Private sector		Professional		Non-professional	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Training with same employer in spell t	0.056 (0.005)	0.000	0.060 (0.006)	0.000	0.093 (0.009)	0.000	0.041 (0.005)	0.000
Training with same employer in spell t-1	0.007 (0.002)	0.003	0.010 (0.003)	0.002	0.006 (0.006)	0.311	0.008 (0.003)	0.001
Training with same employer in spell t-2	0.013 (0.003)	0.000	0.013 (0.004)	0.000	0.028 (0.007)	0.000	0.007 (0.003)	0.005
Training with previous employer in spell t-1	0.009 (0.005)	0.068	0.010 (0.006)	0.092	0.028 (0.015)	0.036	0.002 (0.004)	0.714
Training with previous employer in spell t-2	0.003 (0.005)	0.587	0.006 (0.007)	0.354	-0.006 (0.013)	0.653	0.006 (0.006)	0.238
Promotion with same employer in spell t-1	0.038 (0.006)	0.000	0.023 (0.006)	0.000	0.058 (0.012)	0.000	0.040 (0.008)	0.000
Promotion with same employer in spell t-2	0.002 (0.004)	0.617	-0.003 (0.004)	0.451	0.000 (0.010)	0.965	0.004 (0.005)	0.402
Promotion with previous employer in spell t-1	0.043 (0.021)	0.005	0.052 (0.031)	0.016	0.015 (0.030)	0.608	0.075 (0.035)	0.000
Promotion with previous employer in spell t-2	-0.003 (0.012)	0.795	0.003 (0.020)	0.858	-0.018 (0.028)	0.558	0.003 (0.016)	0.815
Interaction training*tenure	0.00010 (0.000)	0.000	0.00011 (0.000)	0.000	0.00022 (0.000)	0.000	0.00001 (0.000)	0.000

See footnotes to table 5.3a.

It can also be noticed that for men, training *and* promotions variables with the same employer accumulate to a higher impact on promotion, whereas for women the variables with the relatively higher impact on promotion are training variables. This finding is in accordance with Melero (2004), who notes that females' career

paths tend to be determined by their human capital, while males rely more on promotion mechanisms for determining their career paths.

In terms of the impact of control variables on promotion probabilities with the current employer, there is strong evidence to support the fact that age enters negatively in an inverted U-shape relationship with promotion (except for professionals), suggesting diminishing chances of promotion with career advancements with current employer. This may be a consequence of out-or-up contracts, an empirical evidence for tournament theory, and could be interpreted as a result of having been promoted to the extent that there are not higher positions to fill. Marital status has a similar effect on promotion as on training probabilities: for men only, being married leads to a higher chance of promotion.

Respondents' highest educational qualification does not appear to be extensively used by employers to signal promotion potential. There are two exceptions: (1) employers of female professionals, for whom levels of education below higher education are significant in lowering the probability of promotions; and (2) employers of non-professional men who seem to use education levels to signal increased promotion potential.

There is evidence of highly significant company size effects, larger for men than for women, with workers in larger companies being more likely to be promoted, possibly due to wider internal job ladders and more complex hierarchical organisation. This discrepancy between genders reinforces the assumption (also encountered in other estimations in this chapter) that men may have a relatively higher

knowledge of, or preference for using internal company politics in order to advance their careers.

Tenure, union membership and number of overtime hours worked are all highly significant for promotion prospects, but the marginal effects are very small (under 0.1). Variables that control for the effects of the type of labour contract show, broadly, that workers employed in these labour arrangements suffer negative consequences with regard to their promotion prospects.

5.4.2. The interdependence between training and promotion

Tables 5.3 and 5.4 have assumed training and promotion to be exogenous and have ignored model specification problems related to the interdependence of training and promotion, such as the endogeneity of training. To address this, a bivariate probit model of training and promotion is estimated using maximum likelihood estimation, and results are reported for men in Table 5.5a (Part 1 for trained and Part 2 for promoted), and for women in Table 5.5b (Part 1 for trained and Part 2 for promoted).

Training.

Tables 5.5a (Part 1) and 5.5b (Part 1) further show that training depends largely on previous training for all categories in the dataset. This reinforces the conclusion reached above, in that an initial training episode generates further training.

Table 5.5a. Bivariate probit estimates of probability of promotion and training coefficients: Male employees. **Part 1:** Male employees, trained (table partially presented here –full table is shown at the end of the chapter)

	All trained		Private sector trained		Professional trained		Non-professional trained	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Training with same employer in spell t-1	0.690 (0.021)	0.000	0.696 (0.024)	0.000	0.703 (0.030)	0.000	0.685 (0.028)	0.000
Training with same employer in spell t-2	0.257 (0.022)	0.000	0.249 (0.026)	0.000	0.296 (0.032)	0.000	0.228 (0.032)	0.000
Training with previous employer in spell t-1	0.594 (0.044)	0.000	0.549 (0.049)	0.000	0.727 (0.069)	0.000	0.502 (0.059)	0.000
Training with previous employer in spell t-2	0.154 (0.048)	0.001	0.166 (0.054)	0.002	0.132 (0.075)	0.079	0.185 (0.064)	0.004

See footnotes to table 5.3a.

Table 5.5a. Ctn. Bivariate probit estimates of probability of promotion and training coefficients: Male employees. **Part 1:** Male employees, trained (table partially presented here –full table is shown at the end of the chapter)

	All trained		Private sector trained		Professional trained		Non-professional trained	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Promotion with same employer in spell t-1	0.077 (0.035)	0.030	0.055 (0.040)	0.172	0.041 (0.044)	0.350	0.126 (0.058)	0.031
Promotion with same employer in spell t-2	-0.006 (0.039)	0.888	0.011 (0.045)	0.811	-0.030 (0.048)	0.527	0.028 (0.065)	0.662
Promotion with previous employer in spell t-1	0.030 (0.162)	0.854	-0.020 (0.199)	0.920	-0.030 (0.202)	0.883	0.069 (0.289)	0.810
Promotion with previous employer in spell t-2	-0.168 (0.186)	0.369	-0.179 (0.221)	0.419	-0.324 (0.226)	0.152	0.088 (0.285)	0.757

See footnotes to table 5.3a.

Table 5.5b. Bivariate probit estimates of probability of promotion and training coefficients : Female employees. **Part 1:** Female employees, trained (table partially presented here –full table is shown at the end of the chapter)

	All trained		Private sector trained		Professional trained		Non-professional trained	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Training with same employer in spell t-1	0.621 (0.020)	0.000	0.606 (0.029)	0.000	0.602 (0.032)	0.000	0.641 (0.026)	0.000
Training with same employer in spell t-2	0.271 (0.022)	0.000	0.268 (0.031)	0.000	0.311 (0.035)	0.000	0.265 (0.029)	0.000
Training with previous employer in spell t-1	0.584 (0.042)	0.000	0.633 (0.052)	0.000	0.478 (0.066)	0.000	0.675 (0.053)	0.000
Training with previous employer in spell t-2	0.199 (0.047)	0.000	0.122 (0.062)	0.049	0.152 (0.071)	0.032	0.259 (0.062)	0.000
Promotion with same employer in spell t-1	0.085 (0.037)	0.023	0.179 (0.048)	0.000	0.042 (0.052)	0.413	0.145 (0.055)	0.008
Promotion with same employer in spell t-2	-0.053 (0.041)	0.200	-0.050 (0.053)	0.347	-0.039 (0.056)	0.479	-0.068 (0.063)	0.281
Promotion with previous employer in spell t-1	0.279 (0.138)	0.044	0.160 (0.188)	0.394	0.350 (0.198)	0.078	0.242 (0.194)	0.212
Promotion with previous employer in spell t-2	-0.012 (0.144)	0.932	-0.059 (0.226)	0.793	-0.214 (0.177)	0.226	0.256 (0.214)	0.233

See footnotes to table 5.3a.

Previous promotions are mainly not related to current training, with the exception of promotion with current employer in the previous 1 to 2 spells. An interpretation could be that the need for training was addressed prior to promotion, hence employees who are promoted are much less likely to be those who benefit from contemporaneous training⁹³ - yet another proof of the ‘cherry picking’ hypothesis.

⁹³ It is important to emphasise that contemporaneous training relates to the current promotion spell, which could last an undetermined length of time.

Looking at control variables, age men's probability to be trained decreases as they approach retirement age. Age is not significant for women with regard to their probability of being trained. Marital status is also only relevant for men, suggesting increased promotion probabilities for married employees. Higher education levels are associated with higher training incidence across all categories. This may suggest that the development of a desire to accumulate knowledge prior to the start of working life is a good indicator of the occurrence of further training episodes. Tenure appears to be significantly related to training probabilities for male and female professionals, but the marginal effects are small. Union membership is positive and highly significant across categories, with quite large coefficients, the largest impact being in the private sector (0.20 for women in the private sector). The effects of company size, number of hours worked and types of contract largely mirror those from Tables 5.3 and 5.4. Men working part-time seem to fare the worst with regard to their training probability, which is not surprising considering their lower attachment to the firm.

Promotion

Turning to **promotion**, Tables 5.5a (Part 2) and 5.5b (Part 2) show that regardless of gender, sector or occupation, the probability of promotion depends mostly on the occurrence of previous promotions with current employer (coefficients are highly significant for lag $t-1$). The finding that promotions tend to depend so significantly on previous promotions is evidence that employers tend to use internal job ladders.⁹⁴

⁹⁴ In so far as the BHPS is constructed, external hiring is picked up in the dataset via controlling for the type of contract, and variables related to the usage by the company of agency, freelance and temporary workers.

For male employees only, promotion in previous 2 to 3 spells (lag t-2) is also significantly associated to current promotion, whereas for women this is not so. Instead, current promotions here take into account promotions with previous employers in spells 1 to 2.

Table 5.5a. Part 2: Male employees, promoted
(table partially presented here –full table is shown at the end of the chapter)

	All promoted		Private sector promoted		Professional promoted		Non-professional promoted	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Training with same employer in spell t-1	0.127 (0.029)	0.000	0.132 (0.033)	0.000	0.098 (0.039)	0.011	0.157 (0.043)	0.000
Training with same employer in spell t-2	0.150 (0.031)	0.000	0.174 (0.035)	0.000	0.150 (0.041)	0.000	0.156 (0.047)	0.001
Training with previous employer in spell t-1	0.073 (0.062)	0.241	0.118 (0.068)	0.082	0.067 (0.086)	0.434	0.056 (0.090)	0.536
Training with previous employer in spell t-2	0.051 (0.066)	0.437	0.052 (0.073)	0.472	0.158 (0.086)	0.067	-0.116 (0.114)	0.310
Promotion with same employer in spell t-1	0.504 (0.040)	0.000	0.477 (0.045)	0.000	0.453 (0.049)	0.000	0.635 (0.065)	0.000
Promotion with same employer in spell t-2	0.130 (0.049)	0.008	0.133 (0.054)	0.014	0.123 (0.060)	0.043	0.214 (0.084)	0.010
Promotion with previous employer in spell t-1	0.346 (0.191)	0.070	0.270 (0.233)	0.248	0.127 (0.246)	0.605	0.727 (0.289)	0.012
Promotion with previous employer in spell t-2	-0.033 (0.219)	0.880	-0.131 (0.321)	0.682	-0.150 (0.238)	0.529	0.061 (0.532)	0.909

See footnotes to table 5.3a.

Table 5.5b. Part 2: Female employees, promoted
(table partially presented here –full table is shown at the end of the chapter)

	All promoted		Private sector promoted		Professional promoted		Non-professional promoted	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Training with same employer in spell t-1	0.167 (0.031)	0.000	0.200 (0.041)	0.000	0.104 (0.043)	0.015	0.231 (0.044)	0.000
Training with same employer in spell t-2	0.181 (0.034)	0.000	0.180 (0.047)	0.000	0.204 (0.047)	0.000	0.156 (0.049)	0.002
Training with previous employer in spell t-1	0.187 (0.061)	0.002	0.207 (0.074)	0.005	0.228 (0.086)	0.008	0.128 (0.089)	0.150
Training with previous employer in spell t-2	0.053 (0.071)	0.454	0.084 (0.086)	0.328	-0.044 (0.097)	0.653	0.145 (0.100)	0.146
Promotion with same employer in spell t-1	0.412 (0.046)	0.000	0.305 (0.058)	0.000	0.364 (0.059)	0.000	0.538 (0.070)	0.000
Promotion with same employer in spell t-2	0.018 (0.056)	0.745	-0.070 (0.071)	0.325	-0.002 (0.072)	0.973	0.060 (0.086)	0.489
Promotion with previous employer in spell t-1	0.452 (0.151)	0.003	0.499 (0.205)	0.015	0.139 (0.198)	0.483	0.787 (0.210)	0.000
Promotion with previous employer in spell t-2	-0.056 (0.191)	0.770	0.053 (0.262)	0.839	-0.164 (0.251)	0.514	0.096 (0.286)	0.737

See footnotes to table 5.3a.

The impact of female previous training on female promotions is bigger than the impact of male previous training on male promotions. When training is done with the current employer, it is highly significant across all categories in this study and has a positive impact on promotion probabilities. This is further evidence for the cherry picking hypothesis. However, for men, training episodes with previous employers in periods $t-1$ and $t-2$ do not have an impact on current promotion.

Control variables entered in these estimations show that age is only significant for female promotions (with the exception of professionals), and appears to

follow an inverted U-shape profile with a maximum around 30 for female professionals. This is consistent with women returning to full-time work and resumption of career after childbirth. Marital status is significant only for men where it impacts positively on their promotion prospects. Education variables broadly show that when deciding who gets the promotion, employers would not use education as a signal of potential. However, the variables available are not precise enough to cover educational achievement in more detail. Tenure is highly significant across categories, but the estimated coefficients are small. Thus, promotions are a reward for long-service. It is also possible that using tenure (i.e. experience) as a predictor for promotion is less costly than using more rigorous and detailed evaluations of worker performance. The number of overtime hours worked is an important determinant of promotion. This result is consistent with the 'rat race' theory of Landers *et al.* (1996 : 329) whereby extra 'billable' overtime hours worked are perceived by employers as a signal of a high level of commitment and increased effort by workers, even if greater hours are associated with a diminishing marginal product. Union membership is only significant for the promotion prospects of females working in the private sector. The impacts of company size and type of employment contract largely mirror those obtained in Tables 5.3 and 5.4.

The marginal effects in the bivariate probit are higher for most of the independent variables and the control variables (sometimes higher by a factor of 3) than the marginal effects obtained in the separate probit models for training estimated separately from promotion. This original approach taken in this chapter by analysing training and promotion in a bivariate probit, expands the extant knowledge on the

inter-relationship between training and promotion where estimates seem to have been very much biased downwards.⁹⁵

5.4.3. The impact of training and promotion on wages

Tables 5.6 and 5.7 report results from two independent fixed effects wage equations where the dependent variable is the natural logarithm of real weekly wages at current prices. In these equations promotion and training are treated as exogenous dummy variables.

⁹⁵ It is not unusual for bivariate probit results to vary in size from univariate probit results. In essence, this variation is evidence to the need of estimations that also take into account the inter-relations between variables. For an example of a study within the literature of employee-related organisational outcomes, in which bivariate probit model results differ from univariate probit model results, see Rayton (2006).

Table 5.6a. OLS fixed effects wage equations: The impact of training on male wages
(table partially presented here –full table is shown at the end of the chapter)

	All		Private sector		Professional		Non-professional	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Training with same employer in spell t	0.000 (0.004)	0.973	-0.006 (0.005)	0.181	0.004 (0.006)	0.534	-0.003 (0.006)	0.600
Training with same employer in spell t-1	0.011 (0.004)	0.009	0.005 (0.005)	0.335	0.009 (0.006)	0.149	0.013 (0.006)	0.025
Training with same employer in spell t-2	0.013 (0.004)	0.003	0.012 (0.005)	0.017	0.012 (0.006)	0.052	0.015 (0.006)	0.016
Training with previous employer in spell t-1	0.007 (0.009)	0.417	0.002 (0.010)	0.837	0.017 (0.014)	0.208	0.005 (0.012)	0.709
Training with previous employer in spell t-2	0.013 (0.010)	0.201	0.012 (0.011)	0.293	0.017 (0.014)	0.231	0.008 (0.013)	0.545
Total Promoted t-1	0.030 (0.004)	0.000	0.023 (0.004)	0.000	0.029 (0.005)	0.000	0.017 (0.006)	0.010

See footnotes to table 5.3a.

Table 5.6b. OLS fixed effects wage equations: The impact of training on female wages (table partially presented here –full table is shown at the end of the chapter)

	All		Private sector		Professional		Non-professional	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Training with same employer in spell t	0.018 (0.005)	0.000	0.010 (0.007)	0.144	0.016 (0.007)	0.016	0.017 (0.006)	0.004
Training with same employer in spell t-1	0.023 (0.005)	0.000	0.019 (0.007)	0.006	0.019 (0.007)	0.005	0.023 (0.006)	0.000
Training with same employer in spell t-2	0.019 (0.005)	0.000	0.015 (0.007)	0.038	0.014 (0.007)	0.045	0.023 (0.007)	0.001
Training with previous employer in spell t-1	0.044 (0.010)	0.000	0.034 (0.013)	0.012	0.030 (0.015)	0.044	0.039 (0.014)	0.005
Training with previous employer in spell t-2	0.014 (0.011)	0.214	-0.001 (0.015)	0.947	0.022 (0.016)	0.163	0.007 (0.015)	0.663
Total Promoted t-1	0.043 (0.005)	0.000	0.040 (0.007)	0.000	0.047 (0.007)	0.000	0.040 (0.008)	0.000

See footnotes to table 5.3a.

In Table 5.6, returns to recent training are only significant for women and at just over 1.5 %, are somewhat lower than those previously reported in the extant studies which do not control for promotion (e.g. Pischke 2001 or Ariga and Brunello 2006). The inclusion of promotion in the econometric model, which is the main

original contribution made by this chapter to the literature on training, may have reduced returns to training. It may be that the employee needs time to assimilate this training, or that it takes time to prove the increased post-training work ability that should then be rewarded by higher wages. Thus, employees may have to wait until the productivity effects of their training are visible to the employer who then increases their wages. Alternatively, it may be that the employers choose to postpone by as much as possible the rewarding of such training. To this extent, there could thus be evidence of the dual-moral hazard problem exposed in the theoretical section of this chapter. It is to be noted that if training raises the productivity levels of workers, then workers expect a share of the increased economic rents - otherwise they quit.

For both men and women, there is however more significant evidence that previous training spells are reflected in wage level increases over time. For women, this is so almost irrespective of whether training episodes were with the previous or the current employer, suggesting that female training may be more general. However, for men it is only the training with the current employer that accounts for higher wages, especially if the time elapsed from a training episode is larger (lag of training with same employer $t-2$). The lack of significant wage effects is especially striking for professional male training episodes. It may be that for the highly skilled, further access to training does not bring significant wage level increases to a wage that is already higher. Additionally, the highly skilled may also have increased access to training that is also more costly to the employer, hence the employer could be reluctant to pay the double bill of both the training cost and the wage increase.

From employees' point of view, these results may also reflect a difference in the character / form of training between genders: there is a female preference for or collection of more frequent or more relevant training, which then *does* translate into wage increases. This assumption reinforces a similar finding (in Section 5.4.1) above, which exposed a possible tendency of women to advance their careers, by pecuniary or non-pecuniary advancement, via human capital accumulation.⁹⁶ On the contrary, to advance in their careers, males resort to the use of promotion mechanisms and achieve differentiation via the accumulation of the promotions stock.

The returns to accumulation of promotions in Table 5.6 are all highly significant, ranging from 1.7 % for non-professional males to 4.7 % for professional females. The relevance of promotions is discussed in more detail below.

Finally, in Table 5.7, returns to recent promotion are in line with findings in the literature, ranging across all observations between a minimum of 4.4% for men non-professionals (while women's minimum is of 5.2% for professionals) and a maximum of 7.3% for women non-professionals (while men's maximum is 6% for professionals). Booth *et al.* (2003) found that wage growth for promoted women was significantly lower than for promoted men. This disparity, highly relevant for the 'glass ceiling' debate, is observed here for the women professional category. Booth *et al.* (2003) derive differential returns to promotion for men and women by estimating coefficients on female interaction terms in a pooled wage equation rather than by estimating separate male and female equations as in Tables 5.6 and 5.7. The method

⁹⁶ It may also be that this result reflects the stylised effects of female labour market participation, whereby females tend to have longer or more often career breaks, hence specialise less and consume more frequent training episodes.

employed in this chapter is less restrictive as it does not impose equality of male and female coefficients on the control variables.

Table 5.7a. OLS fixed effects wage equations: The impact of promotion on male wages (table partially presented here –full table is shown at the end of the chapter)

	All		Private sector		Professional		Non-professional	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Promotion with same employer in spell t	0.050 (0.007)	0.000	0.050 (0.008)	0.000	0.060 (0.008)	0.000	0.044 (0.011)	0.000
Promotion with same employer in spell t-1	0.041 (0.007)	0.000	0.045 (0.008)	0.000	0.036 (0.009)	0.000	0.051 (0.011)	0.000
Promotion with same employer in spell t-2	0.040 (0.008)	0.000	0.037 (0.009)	0.000	0.052 (0.009)	0.000	0.023 (0.012)	0.060
Promotion with previous employer in spell t-1	0.036 (0.033)	0.277	0.015 (0.041)	0.725	0.048 (0.041)	0.234	0.025 (0.056)	0.649
Promotion with previous employer in spell t-2	-0.007 (0.034)	0.834	-0.027 (0.042)	0.517	0.039 (0.042)	0.345	-0.031 (0.056)	0.586
Total Trained t-1	0.009 (0.002)	0.000	0.012 (0.002)	0.000	0.006 (0.003)	0.013	0.004 (0.002)	0.073

See footnotes to table 5.3a.

Table 5.7b. OLS fixed effects wage equations: The impact of promotion on female wages (table partially presented here –full table is shown at the end of the chapter)

	All		Private sector		Professional		Non-professional	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Promotion with same employer in spell t	0.061 (0.009)	0.000	0.067 (0.011)	0.000	0.052 (0.011)	0.000	0.073 (0.013)	0.000
Promotion with same employer in spell t-1	0.057 (0.009)	0.000	0.050 (0.011)	0.000	0.052 (0.011)	0.000	0.066 (0.013)	0.000
Promotion with same employer in spell t-2	0.041 (0.010)	0.000	0.034 (0.012)	0.006	0.026 (0.012)	0.028	0.054 (0.015)	0.000
Promotion with previous employer in spell t-1	0.014 (0.032)	0.668	0.018 (0.043)	0.676	0.016 (0.039)	0.690	0.033 (0.046)	0.475
Promotion with previous employer in spell t-2	0.026 (0.033)	0.440	-0.015 (0.048)	0.750	0.036 (0.041)	0.378	0.014 (0.050)	0.772
Total Trained t-1	0.006 (0.002)	0.004	0.011 (0.003)	0.000	0.008 (0.003)	0.010	0.001 (0.003)	0.783

See footnotes to table 5.3a.

The finding that, with the exception of professional women, women's returns to promotion (and especially, *non-professional* women's returns being higher by 3 pp than their male counterparts) are slightly higher than men's (even though the differences are not significant at 5%), could hide some level of unobserved discrepancies in the quality of starting jobs and/or in the level of the labour market entrance wage. This could be the result of women catching-up with men as gender discrimination in the workplace and in society is reduced and as women gain higher qualifications or higher skills through training.

Firstly, with this regard to the quality of starting jobs, it may be that women get what appear to be higher post-promotion wage increases when one starts from a relatively lower wage – the wage could be lower due to the so called “joint job” searches, whereby the female side of a couple accepts a lower wage in the area where her partner finds a job. This is the case in a US study performed by Hersch and Viscusi (1996), which observes that women could find themselves constrained to start at lower job levels, therefore taking up in jobs with more promotion prospects. Additionally, higher jobs to be promoted into are relatively more numerous when one starts low.

Secondly, with regard to the entrance on the market, Manning and Robinson (2004) use the BHPS and find evidence that the wage gaps between women and men *are* partly related to fact that women working part-time are more likely to be amongst the entrants on the labour market. Having started on a relatively lower wage,

absolute increases in earnings after promotions are thus translated into relatively higher percentage point increases for this category of employees.⁹⁷

Both men and women enjoy positive wage returns to previous promotions awarded by the current employer. For instance, the compounded real returns to a male professional worker promoted annually over the last three years are 14.8 % and equivalent female real returns are rather similar at 13.0 %. It is only these estimated female returns that corroborate the findings of Booth *et al.* 2003 on the inferiority of female returns to promotion.

However, neither men nor women who were promoted with a previous employer one to two years ago continue to experience a post-promotion wage effect contemporaneously. Therefore, workers who were rising up a job ladder in another organization may have to start on a new wage ladder again at the present firm when they switch jobs. This in turn suggests that they may have been unlikely to make further career progress with their former employer.

Returns to total training are significantly greater than zero (except for female non-professionals where the estimate is not significant), ranging from 0.4 % for non-professional males to 1.2 % for male in private employment and with female returns in between. These are somewhat lower than returns estimated in models that do not control for promotion (Pischke 2001, Ariga and Brunello 2006), and this result would have been expected. Therefore this chapter, through its original approach to analysing training and promotion, contributes to unearthing evidence that previous

⁹⁷ Part-time job for non-professional women is significant and positively correlated to wage increases in Table 5b.

estimates of returns to training had conflated training with promotion, therefore their estimates were biased upwards.

Control variables for Tables 5.6 and 5.7 show that age is highly significant across categories only for females, and enters in an inverted U-shape relationship with earnings, with implied maximum wage for males at age 37 and for females at age 60. Being married decreases women's wages, but it increases men's (coefficients are not large), a result previously known in the empirical literature on wages. Education variables are very much in accordance with the abundant literature demonstrating positive returns to schooling, and results here show that this is more so for women. Returns to schooling also appear to be higher than returns to training. Across all categories, tenure, working in larger organisations and number of overtime hours worked enter highly significant with regard to wages. Workers on other types of employment than full-time and permanent are significantly disadvantaged with regard to the wages earned by their counterparts.

5.5. Conclusions and summary

A multi-spell panel of more than 60,000 observations is constructed using information on employment spells for over 10,000 individuals followed in the BHPS waves from 1991 to 2003. The chapter builds on a theoretical framework that supports and encourages more research into understanding the links between training and promotion. The original contribution of this chapter stems mainly from aiming to fill this gap in the empirical economic literature, and from adding a unique sense of time to the analysis: training and promotion are investigated with regard to whether they are contemporaneous or in previous employment, as well as to whether they are with the previous or the current employer. Inspired by previous research, the chapter outlines, tests and finds support for a set of four hypotheses related to training and promotion determinants, as well as the wage returns to training and promotion. Three types of econometric models are estimated: probit, bivariate probit and OLS with fixed effects. The data are split by gender, sector and occupation. Furthermore, the richness of these results allows for the discovery of new findings beyond the scope of the initial hypotheses.

Training and promotion with the same employer are positively associated. Although timing and causation remain unresolved due to the nature of the data available, there is a strong indication of cherry-picking behaviour by employers: for both men and women, the extent of correlation between promotion and training is greater for professional employees than for non-professionals.

Training generates further training, especially if previous training was with the current employer. The two categories of employees likely to receive most frequent training episodes are male in professional occupations, and females in the private sector.

Prior promotions do not have a significant impact on recent training. Having been already promoted, employees are seen as less likely to need enhancement of skills. This is further evidence of training as a precedent to promotion, showing that the two workplace practices are interlinked, and that cherry-picking occurs.

A noteworthy result, which differs from previous research, is that the gender discrimination with regard to training access is not observed in the panel based on BHPS data. This confirms the more recent results reported by Green and Zanchi (1997) who maintain that there has been convergence between genders with regard to training access in Britain.

With regard to the determinants of current promotion, it is estimated that for both men and women training is significantly associated with the likelihood of promotion and that previous training, one to three years ago, is rather irrelevant for recent promotion. Also, previous promotions (but mostly promotions with current employer for male) generate further promotion. This finding is true for both genders, with the sole exception being non-professional workers.

This chapter finds only very little evidence that women are discriminated against with regard to promotion prospects with current employer. The difference between genders is modest, at less than 5 pp difference in women's promotion probability within current employment. Results from a bivariate model which allows for the endogeneity of training and promotion reinforce the findings from the two independent probit models.

Estimations of the wage levels as they change over time show that recent training does not translate into substantial wage increases in the same period of time. It could be that the signal of increased post-training ability takes time to manifest itself. Alternatively, employers may intentionally postpone the due increase in wage, as suggested by the dual-moral hazard problem. For both men and women, there is however significant evidence that previous training spells are reflected in wages increases. Some of the results may be interpreted as proof for a possible tendency of women to advance their careers (by pecuniary or non-pecuniary advancement) via human capital accumulation.

Finally, with regard to returns to recent promotion, wage growth for promoted women is shown to only be lower than for promoted men in the case of women in professional occupations. This finding could hide unobserved discrepancies in the quality of the starting jobs and/or in the level of the labour market entrance wage for women. Both men and women enjoy positive returns to previous promotions awarded by the current employer. However, neither men nor women who were promoted with a previous employer one to two years ago continue to experience a post-promotion wage effect contemporaneously.

A welcome improvement to the BHPS dataset would be the addition of questions that allow for the timing of employment and training spells, as well as the content of training to be better ascertained. Moreover, a question that specifically addresses the incidence of promotion by asking the incumbent whether he/she has been promoted, would be crucial for further research advancements on this topic. Further advancements to this study could be obtained by using a union – non-union data split, or an industry split based on whether the firm is or is not in the production sector.

This chapter is only the beginning of research into the time-effects of training and promotion. It is evident that there is a wealth of unexplored factors and links still waiting to be discovered. The set of results obtained above may prove to have wide-ranging applications for policy makers, firms and employees, as well as advancing the currently limited understanding of the relationship between training and promotion in the labour market.

Summary for Chapter V

- Studying the previously under-researched relationship between training and promotion allows an insight into, and an analysis of, the decisions made by firms with respect to training and promotion.
- The contributions of this chapter are:
 - contributing to closing the gap in the literature on the link between training and promotion. There are many original findings such as the fact that returns to training in the extant literature are biased upwards due to other studies conflating training with promotion;
 - analysing the time dimensionality of when training and promotion occur, and the way they precede or succeed each other within the employment relationship with the same or the previous employer – an original feature of this study;
 - exploiting the potential of the British Household Panel Survey to offer information on the chosen topic of research. A multi-spell panel of more than 60,000 observations is constructed, spanning 13 years (1991 – 2003) of employment records in Britain for over 10,000 individuals.
- The hypotheses tested are:
 - (1) employers offer training to those whom they intend to promote: there is a positive and significant relationship between the probability of being trained at present, on one side, and the history of training and promotion episodes on the other side;
 - (2) employers use training as a filter for searching for promotable employees: the probability of being promoted is higher after training. Recent training has a positive and statistically significant impact on the likelihood of being promoted;
 - (3) the occurrence of training has a positive and statistically significant effect on the level of wages;

(4) the occurrence of promotion has a positive and statistically significant effect on the level of wages as they change over time.

- The models use two dependent variables: training with current employer, and promotion with current employer. Models for recent training and promotion with current employer are generated as two independent regressions, then as interdependent regressions. In the end, a fixed effects model estimates the effect of recent training and promotion with current employer on earnings (real wages).

- Main findings, supporting all four hypotheses, show that:

- promotion with the same employer is related to training with the same employer with marginal effects between 18 pp (for male non-professionals) and almost 30 pp (for female professionals);

- the probability of training increases if the previous training episode was with the current employer, a variable which is a strong predictor of recent training. Marginal effects for men are between 22 pp and 27 pp, and between 19 pp and 23 pp for women;

- a gender discrimination expectation (constructed merely based on the extant literature) with regard to the probability of being trained is not supported by BHPS data. In fact, there has been convergence between genders with regard to training access in Britain;

- it is the most recent training, as opposed to past training with the current or previous employer, that is relevant for promotion;

- for men, training *and* promotions variables with the same employer accumulate to a higher impact on promotion, whereas for women the variables with the relatively higher impact on promotion are training variables. This could suggest that females'

career paths tend to be determined by their human capital, while males rely more on promotion mechanisms;

- the probability of promotion depends mostly on the occurrence of previous promotions with current employer. This is regardless of gender, sector or occupation;

- the wage returns to recent training are only significant for women and score at just over 1.5 %. For both men and women, there is however more significant evidence that previous training spells are reflected in wages increases;

- returns to total training are significantly greater than zero, ranging from 0.4 % for non-professional males to 1.2 % for male in private employment and with female returns in between. These are somewhat lower than returns estimated in models that do not control for promotion. Therefore this chapter, through its original approach to analysing training and promotion, contributes to unearthing evidence that previous estimates of returns to training had conflated training with promotion, therefore their estimates were biased upwards;

- the wage returns to accumulation of promotions are all highly significant, ranging from 1.7 % for non-professional males to 4.7 % for professional females;

- both men and women enjoy positive real wage returns to previous promotions awarded by the current employer. For instance, the compounded returns to a male professional worker promoted annually over the last three years are 14.8% and equivalent female returns are rather similar at 13.0%. However, neither men nor women who were promoted with a previous employer one to two years ago continue to experience a post-promotion wage effect contemporaneously.

TABLES

Table 5.3a.⁹⁸
 Probit marginal effects:

Determinants of recent training with current employer for male employees

	All		Private sector		Professional		Non-professional	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Promotion with same employer in spell t	0.208 (0.020)	0.000	0.205 (0.022)	0.000	0.224 (0.026)	0.000	0.179 (0.030)	0.000
Training with same employer in spell t-1	0.246 (0.008)	0.000	0.238 (0.009)	0.000	0.270 (0.011)	0.000	0.227 (0.010)	0.000
Training with same employer in spell t-2	0.087 (0.008)	0.000	0.079 (0.009)	0.000	0.111 (0.013)	0.000	0.069 (0.010)	0.000
Training with previous employer in spell t-1	0.222 (0.018)	0.000	0.195 (0.019)	0.000	0.285 (0.026)	0.000	0.171 (0.022)	0.000
Training with previous employer in spell t-2	0.052 (0.017)	0.002	0.053 (0.019)	0.003	0.045 (0.030)	0.120	0.060 (0.021)	0.003
Promotion with same employer in spell t-1	0.009 (0.012)	0.458	0.002 (0.013)	0.888	-0.003 (0.017)	0.877	0.022 (0.019)	0.216
Promotion with same employer in spell t-2	-0.005 (0.013)	0.679	-0.001 (0.014)	0.963	-0.015 (0.018)	0.399	0.004 (0.019)	0.822
Promotion with previous employer in spell t-1	-0.003 (0.055)	0.949	-0.016 (0.061)	0.795	-0.020 (0.077)	0.797	-0.000 ⁹⁹ (0.086)	0.998
Promotion with previous employer in spell t-2	-0.053 (0.057)	0.382	-0.049 (0.061)	0.458	-0.113 (0.077)	0.172	0.028 (0.090)	0.750
Interaction promotion*tenure	0.00027 (0.000)	0.000	0.00026 (0.000)	0.001	0.00034 (0.000)	0.001	0.00016 (0.000)	0.115
Personal, job and workplace characteristics ¹⁰⁰								
Age	-0.007 (0.002)	0.001	-0.007 (0.002)	0.002	-0.006 (0.004)	0.174	-0.007 (0.002)	0.003
Age squared	0.005 (0.003)	0.041	0.005 (0.003)	0.066	0.005 (0.005)	0.378	0.005 (0.003)	0.090
Not married	-0.020 (0.008)	0.015	-0.019 (0.009)	0.029	-0.018 (0.014)	0.196	-0.021 (0.010)	0.027

⁹⁸ Columns (1) contain marginal effects, with standard errors in brackets. Columns (2) contain p-values. Estimations are adjusted for clustering by individual.

⁹⁹ Results are estimated to 3 digits, with further digits only added if P-value < 0.100. For instance, this is the case with the interaction variable *promotion*tenure*.

¹⁰⁰ Controls are also introduced for: number of dependent children, health status (disabled), smoker, standard industry category, standard occupation category, region of residence, company sector and year dummies.

Table 5.3a. Continued

	All		Private sector		Professional		Non-professional	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Education: Higher degree	0.013 (0.021)	0.541	0.069 (0.027)	0.008	0.000 (0.028)	0.991	0.043 (0.050)	0.364
Education: First degree	0.060 (0.013)	0.000	0.052 (0.014)	0.000	0.056 (0.020)	0.004	0.055 (0.020)	0.003
Education: Other higher qualification	0.067 (0.010)	0.000	0.073 (0.010)	0.000	0.043 (0.018)	0.020	0.078 (0.011)	0.000
Education: GCE A level	0.024 (0.011)	0.025	0.027 (0.011)	0.014	0.025 (0.022)	0.256	0.022 (0.011)	0.046
Education: Less than O level or other	-0.086 (0.010)	0.000	-0.076 (0.010)	0.000	-0.087 (0.025)	0.001	-0.078 (0.010)	0.000
Company size: 25-99	0.036 (0.008)	0.000	0.039 (0.009)	0.000	0.061 (0.015)	0.000	0.020 (0.009)	0.025
Company size: 100-499	0.056 (0.009)	0.000	0.068 (0.010)	0.000	0.073 (0.015)	0.000	0.042 (0.010)	0.000
Company size: over 500	0.082 (0.010)	0.000	0.109 (0.012)	0.000	0.095 (0.016)	0.000	0.066 (0.012)	0.000
Tenure	0.000 (0.000)	0.510	0.000 (0.000)	0.471	0.000 (0.000)	0.196	0.000 (0.000)	0.635
Part-time job	-0.074 (0.017)	0.000	-0.058 (0.019)	0.004	-0.075 (0.032)	0.026	-0.068 (0.018)	0.001
Temporary contract	-0.120 (0.017)	0.000	-0.104 (0.017)	0.000	-0.145 (0.052)	0.014	-0.111 (0.015)	0.000
Fixed-term contract	-0.094 (0.015)	0.000	-0.078 (0.018)	0.000	-0.130 (0.027)	0.000	-0.068 (0.018)	0.001
No. of hours normally worked per week	-0.001 (0.000)	0.035	-0.001 (0.000)	0.210	-0.001 (0.001)	0.279	-0.001 (0.000)	0.082
No. of overtime hours in normal week	0.001 (0.000)	0.051	0.001 (0.000)	0.207	0.002 (0.001)	0.009	0.000 (0.000)	0.813
Union member	0.053 (0.008)	0.000	0.062 (0.009)	0.000	0.057 (0.013)	0.000	0.046 (0.009)	0.000
Observations	29638		23406		11387		18251	
Pseudo R-squared	0.15		0.15		0.14		0.14	

Table 5.3b.
 Probit marginal effects:
 Determinants of recent training with current employer for female employees

	All		Private sector		Professional		Non-professional	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Promotion with same employer in spell t	0.286 (0.021)	0.000	0.229 (0.026)	0.000	0.292 (0.026)	0.000	0.246 (0.031)	0.000
Training with same employer in spell t-1	0.221 (0.007)	0.000	0.191 (0.010)	0.000	0.235 (0.012)	0.000	0.208 (0.009)	0.000
Training with same employer in spell t-2	0.093 (0.008)	0.000	0.079 (0.010)	0.000	0.120 (0.014)	0.000	0.081 (0.010)	0.000
Training with previous employer in spell t-1	0.215 (0.017)	0.000	0.210 (0.020)	0.000	0.182 (0.025)	0.000	0.234 (0.021)	0.000
Training with previous employer in spell t-2	0.071 (0.017)	0.000	0.035 (0.019)	0.054	0.063 (0.028)	0.025	0.080 (0.021)	0.000
Promotion with same employer in spell t-1	0.015 (0.013)	0.246	0.043 (0.015)	0.003	0.002 (0.021)	0.908	0.029 (0.017)	0.082
Promotion with same employer in spell t-2	-0.019 (0.014)	0.181	-0.014 (0.015)	0.361	-0.015 (0.022)	0.497	-0.021 (0.017)	0.235
Promotion with previous employer in spell t-1	0.083 (0.051)	0.089	0.031 (0.057)	0.578	0.137 (0.076)	0.078	0.048 (0.063)	0.425
Promotion with previous employer in spell t-2	-0.003 (0.049)	0.953	-0.019 (0.059)	0.752	-0.079 (0.068)	0.252	0.077 (0.074)	0.259
Interaction promotion*tenure	0.00157 (0.000)	0.000	0.00039 (0.000)	0.000	0.00174 (0.000)	0.000	0.00036 (0.000)	0.001
Personal, job and workplace characteristics								
Age	0.002 (0.002)	0.344	-0.003 (0.002)	0.224	0.006 (0.005)	0.182	0.001 (0.002)	0.712
Age squared	-0.003 (0.003)	0.262	0.002 (0.003)	0.404	-0.007 (0.006)	0.231	-0.002 (0.003)	0.402
Not married	-0.007 (0.007)	0.364	-0.004 (0.008)	0.601	-0.005 (0.014)	0.712	-0.010 (0.008)	0.203

Table 5.3b. Continued

	All		Private sector		Professional		Non-professional	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Education: Higher degree	0.001 (0.022)	0.947	0.050 (0.039)	0.176	-0.027 (0.029)	0.356	0.182 (0.063)	0.001
Education: First degree	0.033 (0.013)	0.008	0.007 (0.015)	0.632	0.032 (0.021)	0.129	0.033 (0.017)	0.049
Education: Other higher qualification	0.083 (0.009)	0.000	0.070 (0.011)	0.000	0.069 (0.019)	0.000	0.080 (0.010)	0.000
Education: GCE A level	0.031 (0.011)	0.004	0.030 (0.011)	0.005	0.031 (0.026)	0.237	0.027 (0.011)	0.010
Education: Less than O level or other	-0.061 (0.010)	0.000	-0.044 (0.010)	0.000	-0.052 (0.031)	0.093	-0.056 (0.009)	0.000
Company size: 25-99	0.026 (0.008)	0.001	0.034 (0.009)	0.000	0.049 (0.015)	0.001	0.015 (0.008)	0.057
Company size: 100-499	0.042 (0.009)	0.000	0.066 (0.010)	0.000	0.025 (0.017)	0.127	0.044 (0.009)	0.000
Company size: over 500	0.044 (0.010)	0.000	0.095 (0.013)	0.000	0.032 (0.018)	0.063	0.054 (0.011)	0.000
Tenure	0.000 (0.000)	0.342	0.000 (0.000)	0.810	0.000 (0.000)	0.477	0.000 (0.000)	0.553
Part-time job	-0.026 (0.010)	0.015	-0.010 (0.012)	0.414	-0.028 (0.020)	0.163	-0.020 (0.012)	0.092
Temporary contract	-0.129 (0.012)	0.000	-0.113 (0.012)	0.000	-0.180 (0.033)	0.000	-0.107 (0.011)	0.000
Fixed-term contract	-0.040 (0.016)	0.017	-0.003 (0.026)	0.912	-0.071 (0.027)	0.010	-0.009 (0.021)	0.668
No. of hours normally worked per week	0.001 (0.000)	0.008	0.001 (0.001)	0.061	0.001 (0.001)	0.200	0.001 (0.001)	0.022
No. of overtime hours in normal week	0.004 (0.001)	0.000	0.003 (0.001)	0.000	0.004 (0.001)	0.000	0.003 (0.001)	0.000
Union member	0.053 (0.008)	0.000	0.058 (0.011)	0.000	0.055 (0.013)	0.000	0.046 (0.009)	0.000
Observations	30615		18476		9840		20775	
Pseudo R-squared	0.17		0.14		0.13		0.14	

See footnotes to Table 5.3a.

Table 5.4a.
 Probit marginal effects:
 Determinants of recent promotion with current employer for male employees

	All		Private sector		Professional		Non-professional	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Training with same employer in spell t	0.064 (0.005)	0.000	0.069 (0.006)	0.000	0.101 (0.010)	0.000	0.045 (0.006)	0.000
Training with same employer in spell t-1	0.005 (0.003)	0.074	0.005 (0.003)	0.100	0.003 (0.006)	0.589	0.005 (0.003)	0.059
Training with same employer in spell t-2	0.014 (0.003)	0.000	0.017 (0.004)	0.000	0.022 (0.007)	0.001	0.010 (0.004)	0.002
Training with previous employer in spell t-1	0.000 (0.006)	0.958	0.005 (0.007)	0.428	-0.004 (0.014)	0.786	0.000 (0.006)	0.990
Training with previous employer in spell t-2	0.004 (0.007)	0.509	0.004 (0.007)	0.526	0.028 (0.017)	0.065	-0.008 (0.006)	0.247
Promotion with same employer in spell t-1	0.066 (0.007)	0.000	0.060 (0.008)	0.000	0.089 (0.012)	0.000	0.068 (0.011)	0.000
Promotion with same employer in spell t-2	0.013 (0.006)	0.008	0.013 (0.006)	0.017	0.021 (0.011)	0.043	0.017 (0.008)	0.009
Promotion with previous employer in spell t-1	0.041 (0.030)	0.088	0.031 (0.034)	0.259	0.020 (0.046)	0.643	0.088 (0.057)	0.014
Promotion with previous employer in spell t-2	-0.001 (0.020)	0.959	-0.010 (0.024)	0.711	-0.016 (0.033)	0.660	0.003 (0.037)	0.926
Interaction training*tenure	0.00011 (0.000)	0.000	0.00012 (0.000)	0.000	0.00019 (0.000)	0.000	0.00007 (0.000)	0.000
Personal, job and workplace characteristics								
Age	0.001 (0.001)	0.333	0.000 (0.001)	0.608	-0.001 (0.002)	0.775	0.001 (0.001)	0.121
Age squared	-0.003 (0.001)	0.009	-0.003 (0.001)	0.038	-0.003 (0.003)	0.379	-0.003 (0.001)	0.014
Not married	-0.010 (0.003)	0.001	-0.011 (0.003)	0.001	-0.023 (0.007)	0.001	-0.005 (0.003)	0.151

Table 5.4a. Continued

	All		Private sector		Professional		Non-professional	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Education: Higher degree	0.002 (0.007)	0.705	-0.001 (0.007)	0.846	-0.016 (0.012)	0.186	-0.004 (0.012)	0.766
Education: First degree	0.008 (0.005)	0.079	0.005 (0.005)	0.324	-0.016 (0.009)	0.084	0.019 (0.008)	0.003
Education: Other higher qualification	0.004 (0.004)	0.351	0.001 (0.004)	0.869	-0.014 (0.010)	0.160	0.008 (0.003)	0.012
Education: GCE A level	0.001 (0.004)	0.898	-0.002 (0.004)	0.710	-0.016 (0.010)	0.146	0.005 (0.004)	0.220
Education: Less than O level or other	-0.001 (0.004)	0.749	-0.005 (0.005)	0.314	0.007 (0.014)	0.587	-0.004 (0.003)	0.223
Company size: 25-99	0.018 (0.004)	0.000	0.015 (0.004)	0.000	0.025 (0.008)	0.002	0.015 (0.004)	0.000
Company size: 100-499	0.027 (0.004)	0.000	0.026 (0.005)	0.000	0.038 (0.009)	0.000	0.025 (0.005)	0.000
Company size: over 500	0.030 (0.005)	0.000	0.029 (0.006)	0.000	0.044 (0.010)	0.000	0.026 (0.006)	0.000
Tenure	0.00006 (0.000)	0.000	0.00005 (0.000)	0.000	0.00013 (0.000)	0.000	0.00003 (0.000)	0.004
Part-time job	-0.011 (0.007)	0.195	-0.017 (0.008)	0.076	0.006 (0.023)	0.789	-0.015 (0.005)	0.047
Temporary contract	-0.043 (0.002)	0.000	-0.043 (0.002)	0.000	-0.075 (0.014)	0.031	-0.028 (0.002)	0.000
Fixed-term contract	-0.029 (0.004)	0.000	-0.026 (0.006)	0.002	-0.066 (0.009)	0.000	-0.016 (0.005)	0.018
No. of hours normally worked per week	0.000 (0.000)	0.915	-0.000 (0.000)	0.577	0.000 (0.000)	0.186	-0.000 (0.000)	0.225
No. of overtime hours in normal week	0.001 (0.000)	0.000	0.001 (0.000)	0.000	0.002 (0.000)	0.000	0.001 (0.000)	0.000
Union member	0.001 (0.003)	0.762	0.002 (0.004)	0.665	0.004 (0.007)	0.586	-0.004 (0.003)	0.184
Observations	29638		23406		11387		18251	

See footnotes to Table 5.3a.

Table 5.4b.
 Probit marginal effects:
 Determinants of recent promotion with current employer for female employees

	All		Private sector		Professional		Non-professional	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Training with same employer in spell t	0.056 (0.005)	0.000	0.060 (0.006)	0.000	0.093 (0.009)	0.000	0.041 (0.005)	0.000
Training with same employer in spell t-1	0.007 (0.002)	0.003	0.010 (0.003)	0.002	0.006 (0.006)	0.311	0.008 (0.003)	0.001
Training with same employer in spell t-2	0.013 (0.003)	0.000	0.013 (0.004)	0.000	0.028 (0.007)	0.000	0.007 (0.003)	0.005
Training with previous employer in spell t-1	0.009 (0.005)	0.068	0.010 (0.006)	0.092	0.028 (0.015)	0.036	0.002 (0.004)	0.714
Training with previous employer in spell t-2	0.003 (0.005)	0.587	0.006 (0.007)	0.354	-0.006 (0.013)	0.653	0.006 (0.006)	0.238
Promotion with same employer in spell t-1	0.038 (0.006)	0.000	0.023 (0.006)	0.000	0.058 (0.012)	0.000	0.040 (0.008)	0.000
Promotion with same employer in spell t-2	0.002 (0.004)	0.617	-0.003 (0.004)	0.451	0.000 (0.010)	0.965	0.004 (0.005)	0.402
Promotion with previous employer in spell t-1	0.043 (0.021)	0.005	0.052 (0.031)	0.016	0.015 (0.030)	0.608	0.075 (0.035)	0.000
Promotion with previous employer in spell t-2	-0.003 (0.012)	0.795	0.003 (0.020)	0.858	-0.018 (0.028)	0.558	0.003 (0.016)	0.815
Interaction training*tenure	0.00010 (0.000)	0.000	0.00011 (0.000)	0.000	0.00022 (0.000)	0.000	0.00001 (0.000)	0.000
Personal, job and workplace characteristics								
Age	0.001 (0.001)	0.037	0.002 (0.001)	0.013	0.004 (0.002)	0.100	0.001 (0.001)	0.037
Age squared	-0.003 (0.001)	0.003	-0.004 (0.001)	0.001	-0.007 (0.003)	0.021	-0.002 (0.001)	0.010
Not married	-0.003 (0.002)	0.140	-0.002 (0.003)	0.450	-0.002 (0.006)	0.764	-0.004 (0.002)	0.070

Table 5.4b. Continued

	All		Private sector		Professional		Non-professional	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Education: Higher degree	-0.001 (0.006)	0.840	0.003 (0.010)	0.784	-0.021 (0.012)	0.117	-0.000 (0.012)	0.977
Education: First degree	-0.002 (0.003)	0.601	-0.004 (0.004)	0.406	-0.028 (0.008)	0.001	0.005 (0.005)	0.269
Education: Other higher qualification	0.000 (0.003)	0.969	0.001 (0.003)	0.864	-0.021 (0.008)	0.012	0.001 (0.003)	0.580
Education: GCE A level	0.005 (0.004)	0.148	0.003 (0.004)	0.524	-0.012 (0.010)	0.265	0.007 (0.003)	0.016
Education: Less than O level or other	-0.003 (0.003)	0.364	-0.005 (0.004)	0.199	-0.004 (0.012)	0.774	-0.003 (0.002)	0.202
Company size: 25-99	0.004 (0.003)	0.101	0.009 (0.003)	0.004	0.012 (0.008)	0.114	0.001 (0.002)	0.571
Company size: 100-499	0.009 (0.003)	0.002	0.013 (0.004)	0.000	0.021 (0.009)	0.009	0.004 (0.003)	0.092
Company size: over 500	0.012 (0.003)	0.000	0.013 (0.005)	0.002	0.025 (0.009)	0.004	0.006 (0.003)	0.039
Tenure	0.00004 (0.000)	0.000	0.00004 (0.000)	0.000	0.00005 (0.000)	0.042	0.00003 (0.000)	0.000
Part-time job	-0.023 (0.003)	0.000	-0.026 (0.004)	0.000	-0.056 (0.007)	0.000	-0.009 (0.003)	0.005
Temporary contract	-0.024 (0.003)	0.000	-0.029 (0.003)	0.000	-0.043 (0.014)	0.031	-0.017 (0.002)	0.000
Fixed-term contract	-0.016 (0.004)	0.001	-0.015 (0.006)	0.066	-0.039 (0.010)	0.003	-0.011 (0.004)	0.033
No. of hours normally worked per week	0.00028 (0.000)	0.042	0.00016 (0.000)	0.415	0.00011 (0.000)	0.754	0.0058 (0.000)	0.000
No. of overtime hours in normal week	0.001 (0.000)	0.000	0.001 (0.000)	0.000	0.002 (0.000)	0.000	0.001 (0.000)	0.000
Union member	0.003 (0.002)	0.296	0.006 (0.004)	0.125	0.003 (0.006)	0.672	0.001 (0.002)	0.773
Observations	30456		18326		9828		20628	
Pseudo R-squared	0.16		0.18		0.12		0.14	

See footnotes to Table 5.3a.

Table 5.5a.
 Bivariate probit estimates of probability of promotion and training coefficients :
 Male employees
Part 1: Male employees, trained

	All trained		Private sector trained		Professional trained		Non-professional trained	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Training with same employer in spell t-1	0.690 (0.021)	0.000	0.696 (0.024)	0.000	0.703 (0.030)	0.000	0.685 (0.028)	0.000
Training with same employer in spell t-2	0.257 (0.022)	0.000	0.249 (0.026)	0.000	0.296 (0.032)	0.000	0.228 (0.032)	0.000
Training with previous employer in spell t-1	0.594 (0.044)	0.000	0.549 (0.049)	0.000	0.727 (0.069)	0.000	0.502 (0.059)	0.000
Training with previous employer in spell t-2	0.154 (0.048)	0.001	0.166 (0.054)	0.002	0.132 (0.075)	0.079	0.185 (0.064)	0.004
Promotion with same employer in spell t-1	0.077 (0.035)	0.030	0.055 (0.040)	0.172	0.041 (0.044)	0.350	0.126 (0.058)	0.031
Promotion with same employer in spell t-2	-0.006 (0.039)	0.888	0.011 (0.045)	0.811	-0.030 (0.048)	0.527	0.028 (0.065)	0.662
Promotion with previous employer in spell t-1	0.030 (0.162)	0.854	-0.020 (0.199)	0.920	-0.030 (0.202)	0.883	0.069 (0.289)	0.810
Promotion with previous employer in spell t-2	-0.168 (0.186)	0.369	-0.179 (0.221)	0.419	-0.324 (0.226)	0.152	0.088 (0.285)	0.757
Personal, job and workplace characteristics								
Age	-0.021 (0.006)	0.001	-0.023 (0.007)	0.001	-0.018 (0.011)	0.094	-0.023 (0.008)	0.003
Age squared	0.015 (0.008)	0.044	0.016 (0.009)	0.070	0.015 (0.013)	0.273	0.016 (0.010)	0.100
Not married	-0.065 (0.025)	0.008	-0.067 (0.028)	0.017	-0.055 (0.036)	0.130	-0.076 (0.033)	0.021
Education: Higher degree	0.040 (0.061)	0.510	0.206 (0.078)	0.008	-0.003 (0.073)	0.969	0.137 (0.152)	0.369
Education: First degree	0.177 (0.036)	0.000	0.163 (0.041)	0.000	0.137 (0.050)	0.006	0.187 (0.059)	0.002
Education: Other higher qualification	0.198 (0.027)	0.000	0.229 (0.031)	0.000	0.107 (0.048)	0.025	0.258 (0.033)	0.000

Table 5.5a. Continued
Part I. Continued .

	All trained		Private sector trained		Professional trained		Non-professional trained	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Education: GCE A level	0.072 (0.032)	0.023	0.087 (0.035)	0.013	0.061 (0.058)	0.291	0.077 (0.037)	0.039
Education: Less than O level or other	-0.269 (0.033)	0.000	-0.259 (0.036)	0.000	-0.231 (0.070)	0.001	-0.282 (0.037)	0.000
Company size: 25-99	0.116 (0.024)	0.000	0.130 (0.027)	0.000	0.168 (0.039)	0.000	0.076 (0.031)	0.013
Company size: 100-499	0.180 (0.026)	0.000	0.228 (0.029)	0.000	0.207 (0.039)	0.000	0.154 (0.033)	0.000
Company size: over 500	0.248 (0.028)	0.000	0.343 (0.033)	0.000	0.260 (0.041)	0.000	0.228 (0.037)	0.000
Tenure	0.00017 (0.000)	0.041	0.000 (0.000)	0.639	0.00023 (0.000)	0.007	0.000 (0.000)	0.949
Part-time job	-0.243 (0.059)	0.000	-0.210 (0.070)	0.003	-0.203 (0.092)	0.027	-0.264 (0.076)	0.000
Temporary contract	-0.449 (0.068)	0.000	-0.425 (0.076)	0.000	-0.458 (0.170)	0.007	-0.481 (0.075)	0.000
Fixed-term contract	-0.335 (0.057)	0.000	-0.301 (0.073)	0.000	-0.407 (0.083)	0.000	-0.273 (0.077)	0.000
No. of hours normally worked per week	-0.003 (0.001)	0.034	-0.002 (0.001)	0.200	-0.002 (0.002)	0.330	-0.003 (0.002)	0.065
No. of overtime hours in normal week	0.003 (0.001)	0.016	0.002 (0.001)	0.085	0.006 (0.002)	0.002	0.001 (0.002)	0.642
Union member	0.157 (0.022)	0.000	0.197 (0.028)	0.000	0.154 (0.035)	0.000	0.150 (0.028)	0.000
Constant	-0.475 (0.133)	0.000	-0.545 (0.150)	0.000	-0.428 (0.233)	0.066	-0.305 (0.168)	0.070
Observations	29638		23406		11387		18251	
Rho	0.31		0.31		0.31		0.30	

See footnotes to Table 5.3a.

Table 5.5a. Continued
Part 2: Male employees, promoted

	All promoted		Private sector promoted		Professional promoted		Non-professional promoted	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Training with same employer in spell t-1	0.127 (0.029)	0.000	0.132 (0.033)	0.000	0.098 (0.039)	0.011	0.157 (0.043)	0.000
Training with same employer in spell t-2	0.150 (0.031)	0.000	0.174 (0.035)	0.000	0.150 (0.041)	0.000	0.156 (0.047)	0.001
Training with previous employer in spell t-1	0.073 (0.062)	0.241	0.118 (0.068)	0.082	0.067 (0.086)	0.434	0.056 (0.090)	0.536
Training with previous employer in spell t-2	0.051 (0.066)	0.437	0.052 (0.073)	0.472	0.158 (0.086)	0.067	-0.116 (0.114)	0.310
Promotion with same employer in spell t-1	0.504 (0.040)	0.000	0.477 (0.045)	0.000	0.453 (0.049)	0.000	0.635 (0.065)	0.000
Promotion with same employer in spell t-2	0.130 (0.049)	0.008	0.133 (0.054)	0.014	0.123 (0.060)	0.043	0.214 (0.084)	0.010
Promotion with previous employer in spell t-1	0.346 (0.191)	0.070	0.270 (0.233)	0.248	0.127 (0.246)	0.605	0.727 (0.289)	0.012
Promotion with previous employer in spell t-2	-0.033 (0.219)	0.880	-0.131 (0.321)	0.682	-0.150 (0.238)	0.529	0.061 (0.532)	0.909
Personal, job and workplace characteristics								
Age	0.005 (0.009)	0.622	0.000 (0.011)	0.985	-0.009 (0.015)	0.531	0.014 (0.013)	0.263
Age squared	-0.028 (0.012)	0.023	-0.024 (0.014)	0.088	-0.011 (0.018)	0.546	-0.036 (0.017)	0.032
Not married	-0.122 (0.033)	0.000	-0.133 (0.038)	0.000	-0.152 (0.044)	0.000	-0.084 (0.050)	0.091
Education: Higher degree	0.031 (0.068)	0.653	0.009 (0.083)	0.916	-0.108 (0.082)	0.189	-0.021 (0.208)	0.921
Education: First degree	0.101 (0.047)	0.030	0.070 (0.052)	0.174	-0.092 (0.062)	0.138	0.265 (0.080)	0.001
Education: Other higher qualification	0.055 (0.040)	0.164	0.028 (0.044)	0.517	-0.078 (0.062)	0.211	0.139 (0.048)	0.004

Table 5.5a. Continued
Part 2. Continued

	All promoted		Private sector promoted		Professional promoted		Non-professional promoted	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Education: GCE A level	0.019 (0.046)	0.674	-0.001 (0.049)	0.983	-0.091 (0.072)	0.207	0.080 (0.056)	0.152
Education: Less than O level or other	-0.044 (0.048)	0.352	-0.080 (0.052)	0.126	0.015 (0.081)	0.854	-0.099 (0.057)	0.084
Company size: 25-99	0.190 (0.036)	0.000	0.172 (0.039)	0.000	0.171 (0.048)	0.000	0.220 (0.054)	0.000
Company size: 100-499	0.282 (0.036)	0.000	0.280 (0.040)	0.000	0.251 (0.050)	0.000	0.350 (0.053)	0.000
Company size: over 500	0.306 (0.040)	0.000	0.317 (0.046)	0.000	0.287 (0.052)	0.000	0.355 (0.061)	0.000
Tenure	0.001 (0.000)	0.000	0.001 (0.000)	0.000	0.001 (0.000)	0.000	0.001 (0.000)	0.000
Part-time job	-0.168 (0.098)	0.086	-0.245 (0.122)	0.044	-0.006 (0.135)	0.965	-0.342 (0.153)	0.026
Temporary contract	-0.924 (0.204)	0.000	-0.935 (0.238)	0.000	-0.922 (0.401)	0.014	-0.928 (0.243)	0.000
Fixed-term contract	-0.495 (0.103)	0.000	-0.446 (0.128)	0.000	-0.689 (0.149)	0.000	-0.384 (0.146)	0.009
No. of hours normally worked per week	-0.000 (0.002)	0.864	-0.001 (0.002)	0.489	0.002 (0.002)	0.274	-0.004 (0.003)	0.179
No. of overtime hours in normal week	0.011 (0.002)	0.000	0.011 (0.002)	0.000	0.014 (0.002)	0.000	0.009 (0.002)	0.000
Union member	0.028 (0.032)	0.379	0.045 (0.039)	0.245	0.041 (0.044)	0.349	-0.041 (0.045)	0.357
Constant	-1.349 (0.195)	0.000	-1.173 (0.226)	0.000	-0.895 (0.299)	0.003	-1.679 (0.263)	0.000
Observations	29638		23406		11387		18251	
Rho	0.31		0.31		0.31		0.30	

See footnotes to Table 5.3a.

Table 5.5b.

Bivariate probit estimates of probability of promotion and training coefficients:
 Female employees

Part 1: Female employees, trained

	All trained		Private sector trained		Professional trained		Non-professional trained	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Training with same employer in spell t-1	0.621 (0.020)	0.000	0.606 (0.029)	0.000	0.602 (0.032)	0.000	0.641 (0.026)	0.000
Training with same employer in spell t-2	0.271 (0.022)	0.000	0.268 (0.031)	0.000	0.311 (0.035)	0.000	0.265 (0.029)	0.000
Training with previous employer in spell t-1	0.584 (0.042)	0.000	0.633 (0.052)	0.000	0.478 (0.066)	0.000	0.675 (0.053)	0.000
Training with previous employer in spell t-2	0.199 (0.047)	0.000	0.122 (0.062)	0.049	0.152 (0.071)	0.032	0.259 (0.062)	0.000
Promotion with same employer in spell t-1	0.085 (0.037)	0.023	0.179 (0.048)	0.000	0.042 (0.052)	0.413	0.145 (0.055)	0.008
Promotion with same employer in spell t-2	-0.053 (0.041)	0.200	-0.050 (0.053)	0.347	-0.039 (0.056)	0.479	-0.068 (0.063)	0.281
Promotion with previous employer in spell t-1	0.279 (0.138)	0.044	0.160 (0.188)	0.394	0.350 (0.198)	0.078	0.242 (0.194)	0.212
Promotion with previous employer in spell t-2	-0.012 (0.144)	0.932	-0.059 (0.226)	0.793	-0.214 (0.177)	0.226	0.256 (0.214)	0.233
Personal, job and workplace characteristics								
Age	0.004 (0.006)	0.481	-0.010 (0.008)	0.183	0.011 (0.011)	0.339	0.002 (0.007)	0.793
Age squared	-0.007 (0.008)	0.348	0.009 (0.010)	0.363	-0.012 (0.014)	0.390	-0.007 (0.009)	0.443
Not married	-0.021 (0.021)	0.321	-0.015 (0.029)	0.597	-0.011 (0.034)	0.754	-0.037 (0.027)	0.168
Education: Higher degree	0.005 (0.065)	0.938	0.183 (0.120)	0.127	-0.076 (0.072)	0.294	0.536 (0.166)	0.001
Education: First degree	0.100 (0.036)	0.006	0.028 (0.052)	0.585	0.069 (0.053)	0.190	0.117 (0.055)	0.034
Education: Other higher qualification	0.241 (0.026)	0.000	0.236 (0.034)	0.000	0.164 (0.047)	0.001	0.263 (0.030)	0.000

Table 5.5b. Continued
Part 1. Continued

	All trained		Private sector trained		Professional trained		Non-professional trained	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Education: GCE A level	0.095 (0.031)	0.003	0.109 (0.037)	0.003	0.070 (0.065)	0.280	0.097 (0.035)	0.005
Education: Less than O level or other	-0.185 (0.030)	0.000	-0.162 (0.036)	0.000	-0.134 (0.079)	0.090	-0.199 (0.032)	0.000
Company size: 25-99	0.080 (0.023)	0.000	0.126 (0.031)	0.000	0.130 (0.038)	0.001	0.053 (0.028)	0.054
Company size: 100-499	0.128 (0.025)	0.000	0.233 (0.032)	0.000	0.072 (0.041)	0.080	0.153 (0.031)	0.000
Company size: over 500	0.137 (0.028)	0.000	0.315 (0.039)	0.000	0.094 (0.044)	0.031	0.182 (0.035)	0.000
Tenure	0.00027 (0.000)	0.012	0.000 (0.000)	0.177	0.00030 (0.000)	0.025	0.000 (0.000)	0.190
Part-time job	-0.084 (0.031)	0.008	-0.045 (0.045)	0.312	-0.085 (0.051)	0.096	-0.073 (0.040)	0.070
Temporary contract	-0.461 (0.050)	0.000	-0.527 (0.071)	0.000	-0.502 (0.096)	0.000	-0.461 (0.058)	0.000
Fixed-term contract	-0.140 (0.051)	0.006	-0.029 (0.095)	0.760	-0.208 (0.070)	0.003	-0.044 (0.073)	0.542
No. of hours normally worked per week	0.004 (0.001)	0.006	0.004 (0.002)	0.053	0.002 (0.002)	0.210	0.005 (0.002)	0.013
No. of overtime hours in normal week	0.012 (0.002)	0.000	0.011 (0.002)	0.000	0.012 (0.002)	0.000	0.011 (0.003)	0.000
Union member	0.157 (0.022)	0.000	0.201 (0.034)	0.000	0.138 (0.034)	0.000	0.156 (0.029)	0.000
Constant	-1.184 (0.130)	0.000	-0.943 (0.165)	0.000	-1.245 (0.233)	0.000	-1.116 (0.154)	0.000
Observations	30615		18476		9840		20775	
Rho	0.33		0.33		0.31		0.34	

See footnotes to Table 5.3a.

Table 5.5b. Continued
Part 2: Female employees, promoted

	All promoted		Private sector promoted		Professional promoted		Non-professional promoted	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Training with same employer in spell t-1	0.167 (0.031)	0.000	0.200 (0.041)	0.000	0.104 (0.043)	0.015	0.231 (0.044)	0.000
Training with same employer in spell t-2	0.181 (0.034)	0.000	0.180 (0.047)	0.000	0.204 (0.047)	0.000	0.156 (0.049)	0.002
Training with previous employer in spell t-1	0.187 (0.061)	0.002	0.207 (0.074)	0.005	0.228 (0.086)	0.008	0.128 (0.089)	0.150
Training with previous employer in spell t-2	0.053 (0.071)	0.454	0.084 (0.086)	0.328	-0.044 (0.097)	0.653	0.145 (0.100)	0.146
Promotion with same employer in spell t-1	0.412 (0.046)	0.000	0.305 (0.058)	0.000	0.364 (0.059)	0.000	0.538 (0.070)	0.000
Promotion with same employer in spell t-2	0.018 (0.056)	0.745	-0.070 (0.071)	0.325	-0.002 (0.072)	0.973	0.060 (0.086)	0.489
Promotion with previous employer in spell t-1	0.452 (0.151)	0.003	0.499 (0.205)	0.015	0.139 (0.198)	0.483	0.787 (0.210)	0.000
Promotion with previous employer in spell t-2	-0.056 (0.191)	0.770	0.053 (0.262)	0.839	-0.164 (0.251)	0.514	0.096 (0.286)	0.737
Personal, job and workplace characteristics								
Age	0.022 (0.010)	0.026	0.028 (0.012)	0.022	0.029 (0.016)	0.071	0.027 (0.013)	0.038
Age squared	-0.042 (0.013)	0.002	-0.051 (0.016)	0.002	-0.051 (0.021)	0.014	-0.045 (0.017)	0.010
Not married	-0.045 (0.032)	0.154	-0.029 (0.042)	0.491	-0.011 (0.045)	0.811	-0.080 (0.044)	0.070
Education: Higher degree	-0.032 (0.091)	0.729	0.057 (0.130)	0.664	-0.196 (0.106)	0.066	0.076 (0.260)	0.770
Education: First degree	-0.015 (0.051)	0.771	-0.052 (0.071)	0.466	-0.219 (0.069)	0.001	0.114 (0.090)	0.203
Education: Other higher qualification	0.028 (0.039)	0.482	0.028 (0.049)	0.574	-0.148 (0.062)	0.017	0.058 (0.051)	0.257

Table 5.5b. Continued
Part 2. Continued

	All promoted		Private sector promoted		Professional promoted		Non-professional promoted	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Education: GCE A level	0.081 (0.046)	0.077	0.052 (0.056)	0.354	-0.081 (0.080)	0.308	0.149 (0.054)	0.006
Education: Less than O level or other	-0.063 (0.047)	0.173	-0.084 (0.055)	0.124	-0.044 (0.092)	0.634	-0.092 (0.054)	0.092
Company size: 25-99	0.068 (0.036)	0.056	0.141 (0.045)	0.002	0.102 (0.053)	0.056	0.030 (0.048)	0.527
Company size: 100-499	0.136 (0.037)	0.000	0.200 (0.047)	0.000	0.160 (0.056)	0.004	0.109 (0.050)	0.028
Company size: over 500	0.171 (0.041)	0.000	0.207 (0.055)	0.000	0.183 (0.058)	0.001	0.144 (0.058)	0.012
Tenure	0.001 (0.000)	0.000	0.001 (0.000)	0.000	0.001 (0.000)	0.000	0.001 (0.000)	0.000
Part-time job	-0.377 (0.053)	0.000	-0.425 (0.071)	0.000	-0.520 (0.082)	0.000	-0.215 (0.071)	0.002
Temporary contract	-0.615 (0.121)	0.000	-0.916 (0.187)	0.000	-0.517 (0.198)	0.009	-0.699 (0.155)	0.000
Fixed-term contract	-0.328 (0.093)	0.000	-0.269 (0.148)	0.070	-0.383 (0.121)	0.002	-0.328 (0.146)	0.025
No. of hours normally worked per week	0.004 (0.002)	0.030	0.003 (0.003)	0.371	0.001 (0.002)	0.743	0.013 (0.003)	0.000
No. of overtime hours in normal week	0.014 (0.002)	0.000	0.017 (0.003)	0.000	0.012 (0.003)	0.000	0.020 (0.003)	0.000
Union member	0.059 (0.034)	0.081	0.102 (0.050)	0.043	0.037 (0.047)	0.424	0.040 (0.049)	0.409
Constant	-1.906 (0.201)	0.000	-1.909 (0.243)	0.000	-1.676 (0.314)	0.000	-2.345 (0.269)	0.000
Observations	30615		18476		9840		20775	
Rho	0.33		0.33		0.31		0.34	

See footnotes to Table 5.3a.

Table 5.6a.
 OLS fixed effects wage equations:
 The impact of training on male wages

	All		Private sector		Professional		Non-professional	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Training with same employer in spell t	0.000 (0.004)	0.973	-0.006 (0.005)	0.181	0.004 (0.006)	0.534	-0.003 (0.006)	0.600
Training with same employer in spell t-1	0.011 (0.004)	0.009	0.005 (0.005)	0.335	0.009 (0.006)	0.149	0.013 (0.006)	0.025
Training with same employer in spell t-2	0.013 (0.004)	0.003	0.012 (0.005)	0.017	0.012 (0.006)	0.052	0.015 (0.006)	0.016
Training with previous employer in spell t-1	0.007 (0.009)	0.417	0.002 (0.010)	0.837	0.017 (0.014)	0.208	0.005 (0.012)	0.709
Training with previous employer in spell t-2	0.013 (0.010)	0.201	0.012 (0.011)	0.293	0.017 (0.014)	0.231	0.008 (0.013)	0.545
Total Promoted t-1	0.030 (0.004)	0.000	0.023 (0.004)	0.000	0.029 (0.005)	0.000	0.017 (0.006)	0.010
Personal, job and workplace characteristics								
Age	0.079 (0.062)	0.198	0.054 (0.093)	0.562	0.028 (0.073)	0.696	0.027 (0.111)	0.806
Age squared	-0.114 (0.003)	0.000	-0.116 (0.003)	0.000	-0.120 (0.005)	0.000	-0.107 (0.004)	0.000
Not married	0.002 (0.008)	0.816	0.004 (0.009)	0.662	-0.026 (0.011)	0.023	0.030 (0.010)	0.003
Education: Higher degree	0.162 (0.034)	0.000	0.222 (0.049)	0.000	0.055 (0.042)	0.192	-0.038 (0.084)	0.648
Education: First degree	0.146 (0.025)	0.000	0.136 (0.032)	0.000	0.044 (0.036)	0.216	0.158 (0.046)	0.001
Education: Other higher qualification	0.032 (0.012)	0.008	0.018 (0.014)	0.198	-0.020 (0.027)	0.445	0.061 (0.014)	0.000

Table 5.6a. Continued

	All		Private sector		Professional		Non-professional	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Education: GCE A level	0.033 (0.015)	0.024	0.020 (0.017)	0.216	-0.034 (0.032)	0.290	0.065 (0.017)	0.000
Education: Less than O level or other	-0.021 (0.017)	0.214	-0.039 (0.019)	0.041	0.010 (0.049)	0.847	-0.009 (0.019)	0.624
Company size: 25-99	0.048 (0.006)	0.000	0.056 (0.006)	0.000	0.066 (0.009)	0.000	0.038 (0.007)	0.000
Company size: 100-499	0.074 (0.006)	0.000	0.076 (0.007)	0.000	0.055 (0.010)	0.000	0.079 (0.008)	0.000
Company size: over 500	0.088 (0.007)	0.000	0.102 (0.009)	0.000	0.053 (0.011)	0.000	0.098 (0.010)	0.000
Tenure	0.001 (0.000)	0.000	0.001 (0.000)	0.000	0.001 (0.000)	0.000	0.001 (0.000)	0.000
Part-time job	-0.310 (0.013)	0.000	-0.276 (0.016)	0.000	-0.213 (0.021)	0.000	-0.343 (0.017)	0.000
Temporary contract	-0.138 (0.013)	0.000	-0.123 (0.014)	0.000	-0.202 (0.034)	0.000	-0.105 (0.014)	0.000
Fixed-term contract	-0.059 (0.012)	0.000	-0.060 (0.015)	0.000	-0.045 (0.019)	0.015	-0.063 (0.016)	0.000
No. of hours normally worked per week	0.005 (0.000)	0.000	0.005 (0.000)	0.000	0.002 (0.000)	0.000	0.007 (0.000)	0.000
No. of overtime hours in normal week	0.007 (0.000)	0.000	0.007 (0.000)	0.000	0.002 (0.000)	0.000	0.009 (0.000)	0.000
Union member	0.057 (0.006)	0.000	0.063 (0.008)	0.000	0.061 (0.011)	0.000	0.051 (0.008)	0.000
Constant	4.124 (2.377)	0.083	5.081 (3.518)	0.149	6.896 (2.916)	0.018	5.701 (4.156)	0.170
Observations	29638		23406		11387		18251	
Number of cross-wave person identifier	5306		4581		2454		4123	
R-squared Within	0.37		0.38		0.35		0.37	

See footnotes to Table 5.3a.

Table 5.6b.
 OLS fixed effects wage equations:
 The impact of training on female wages

	All		Private sector		Professional		Non-professional	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Training with same employer in spell t	0.018 (0.005)	0.000	0.010 (0.007)	0.144	0.016 (0.007)	0.016	0.017 (0.006)	0.004
Training with same employer in spell t-1	0.023 (0.005)	0.000	0.019 (0.007)	0.006	0.019 (0.007)	0.005	0.023 (0.006)	0.000
Training with same employer in spell t-2	0.019 (0.005)	0.000	0.015 (0.007)	0.038	0.014 (0.007)	0.045	0.023 (0.007)	0.001
Training with previous employer in spell t-1	0.044 (0.010)	0.000	0.034 (0.013)	0.012	0.030 (0.015)	0.044	0.039 (0.014)	0.005
Training with previous employer in spell t-2	0.014 (0.011)	0.214	-0.001 (0.015)	0.947	0.022 (0.016)	0.163	0.007 (0.015)	0.663
Total Promoted t-1	0.043 (0.005)	0.000	0.040 (0.007)	0.000	0.047 (0.007)	0.000	0.040 (0.008)	0.000
Personal, job and workplace characteristics								
Age	0.097 (0.028)	0.000	0.097 (0.028)	0.000	0.203 (0.069)	0.003	0.061 (0.030)	0.040
Age squared	-0.079 (0.003)	0.000	-0.087 (0.005)	0.000	-0.096 (0.006)	0.000	-0.069 (0.004)	0.000
Not married	0.021 (0.008)	0.010	0.030 (0.010)	0.005	0.002 (0.013)	0.847	0.017 (0.010)	0.090
Education: Higher degree	0.275 (0.042)	0.000	0.340 (0.091)	0.000	0.144 (0.051)	0.004	0.393 (0.134)	0.003
Education: First degree	0.177 (0.026)	0.000	0.215 (0.052)	0.000	0.065 (0.039)	0.094	0.331 (0.046)	0.000
Education: Other higher qualification	0.037 (0.013)	0.006	0.028 (0.018)	0.123	0.055 (0.029)	0.056	0.016 (0.016)	0.321

Table 5.6b. Continued

	All		Private sector		Professional		Non-professional	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Education: GCE A level	0.028 (0.017)	0.092	0.042 (0.023)	0.066	0.015 (0.039)	0.690	0.038 (0.019)	0.053
Education: Less than O level or other	-0.005 (0.018)	0.798	0.017 (0.024)	0.462	-0.096 (0.052)	0.066	0.015 (0.020)	0.464
Company size: 25-99	0.070 (0.006)	0.000	0.077 (0.008)	0.000	0.023 (0.010)	0.024	0.078 (0.008)	0.000
Company size: 100-499	0.103 (0.007)	0.000	0.109 (0.010)	0.000	0.058 (0.012)	0.000	0.109 (0.009)	0.000
Company size: over 500	0.110 (0.009)	0.000	0.121 (0.012)	0.000	0.055 (0.013)	0.000	0.125 (0.011)	0.000
Tenure	0.001 (0.000)	0.000	0.001 (0.000)	0.000	0.00035 (0.000)	0.034	0.001 (0.000)	0.000
Part-time job	-0.213 (0.008)	0.000	-0.163 (0.011)	0.000	-0.312 (0.014)	0.000	-0.079 (0.010)	0.000
Temporary contract	-0.083 (0.011)	0.000	-0.108 (0.015)	0.000	-0.182 (0.022)	0.000	-0.062 (0.013)	0.000
Fixed-term contract	-0.051 (0.013)	0.000	-0.103 (0.023)	0.000	-0.090 (0.016)	0.000	-0.072 (0.018)	0.000
No. of hours normally worked per week	0.021 (0.000)	0.000	0.023 (0.000)	0.000	0.007 (0.000)	0.000	0.033 (0.000)	0.000
No. of overtime hours in normal week	0.005 (0.000)	0.000	0.007 (0.001)	0.000	0.003 (0.001)	0.000	0.009 (0.001)	0.000
Union member	0.057 (0.007)	0.000	0.043 (0.011)	0.000	0.034 (0.010)	0.000	0.053 (0.009)	0.000
Constant	1.909 (1.081)	0.077	2.008 (1.034)	0.052	-1.033 (2.689)	0.701	2.502 (1.166)	0.032
Observations	30615		18476		9840		20775	
Number of cross-wave person identifier	5457		4041		2329		4425	
R-squared Within	0.50		0.50		0.39		0.54	

See footnotes to Table 5.3a.

Table 5.7a.
 OLS fixed effects wage equations:
 The impact of promotion on male wages

	All		Private sector		Professional		Non-professional	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Promotion with same employer in spell t	0.050 (0.007)	0.000	0.050 (0.008)	0.000	0.060 (0.008)	0.000	0.044 (0.011)	0.000
Promotion with same employer in spell t-1	0.041 (0.007)	0.000	0.045 (0.008)	0.000	0.036 (0.009)	0.000	0.051 (0.011)	0.000
Promotion with same employer in spell t-2	0.040 (0.008)	0.000	0.037 (0.009)	0.000	0.052 (0.009)	0.000	0.023 (0.012)	0.060
Promotion with previous employer in spell t-1	0.036 (0.033)	0.277	0.015 (0.041)	0.725	0.048 (0.041)	0.234	0.025 (0.056)	0.649
Promotion with previous employer in spell t-2	-0.007 (0.034)	0.834	-0.027 (0.042)	0.517	0.039 (0.042)	0.345	-0.031 (0.056)	0.586
Total Trained t-1	0.009 (0.002)	0.000	0.012 (0.002)	0.000	0.006 (0.003)	0.013	0.004 (0.002)	0.073
Personal, job and workplace characteristics								
Age	0.075 (0.062)	0.221	0.046 (0.093)	0.621	0.025 (0.072)	0.734	0.030 (0.111)	0.783
Age squared	-0.115 (0.003)	0.000	-0.116 (0.003)	0.000	-0.121 (0.005)	0.000	-0.107 (0.004)	0.000
Not married	0.003 (0.008)	0.718	0.006 (0.009)	0.512	-0.024 (0.011)	0.036	0.031 (0.010)	0.002
Education: Higher degree	0.162 (0.034)	0.000	0.207 (0.049)	0.000	0.063 (0.043)	0.141	-0.010 (0.084)	0.905
Education: First degree	0.142 (0.025)	0.000	0.126 (0.032)	0.000	0.047 (0.036)	0.193	0.157 (0.046)	0.001
Education: Other higher qualification	0.031 (0.012)	0.011	0.011 (0.014)	0.420	-0.014 (0.027)	0.586	0.063 (0.014)	0.000

Table 5.7a. Continued

	All		Private sector		Professional		Non-professional	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Education: GCE A level	0.032 (0.015)	0.028	0.019 (0.017)	0.253	-0.029 (0.032)	0.369	0.065 (0.017)	0.000
Education: Less than O level or other	-0.023 (0.017)	0.187	-0.040 (0.019)	0.034	-0.004 (0.049)	0.942	-0.009 (0.019)	0.635
Company size: 25-99	0.047 (0.006)	0.000	0.055 (0.006)	0.000	0.063 (0.009)	0.000	0.038 (0.007)	0.000
Company size: 100-499	0.073 (0.006)	0.000	0.074 (0.007)	0.000	0.052 (0.010)	0.000	0.079 (0.008)	0.000
Company size: over 500	0.086 (0.007)	0.000	0.100 (0.009)	0.000	0.051 (0.011)	0.000	0.097 (0.010)	0.000
Tenure	0.001 (0.000)	0.000	0.001 (0.000)	0.000	0.001 (0.000)	0.000	0.001 (0.000)	0.000
Part-time job	-0.311 (0.013)	0.000	-0.274 (0.016)	0.000	-0.217 (0.020)	0.000	-0.341 (0.017)	0.000
Temporary contract	-0.135 (0.013)	0.000	-0.120 (0.014)	0.000	-0.195 (0.034)	0.000	-0.103 (0.014)	0.000
Fixed-term contract	-0.056 (0.012)	0.000	-0.057 (0.015)	0.000	-0.038 (0.019)	0.042	-0.061 (0.016)	0.000
No. of hours normally worked per week	0.005 (0.000)	0.000	0.005 (0.000)	0.000	0.002 (0.000)	0.000	0.007 (0.000)	0.000
No. of overtime hours in normal week	0.007 (0.000)	0.000	0.007 (0.000)	0.000	0.002 (0.000)	0.000	0.009 (0.000)	0.000
Union member	0.057 (0.006)	0.000	0.063 (0.008)	0.000	0.061 (0.011)	0.000	0.050 (0.008)	0.000
Constant	4.282 (2.374)	0.071	5.375 (3.510)	0.126	7.045 (2.907)	0.015	5.575 (4.153)	0.180
Observations	29638		23406		11387		18251	
Number of cross-wave person identifier	5306		4581		2454		4123	
R-squared Within	0.37		0.38		0.35		0.37	

See footnotes to Table 5.3a.

Table 5.7b.
 OLS fixed effects wage equations:
 The impact of promotion on female wages

	All		Private sector		Professional		Non-professional	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Promotion with same employer in spell t	0.061 (0.009)	0.000	0.067 (0.011)	0.000	0.052 (0.011)	0.000	0.073 (0.013)	0.000
Promotion with same employer in spell t-1	0.057 (0.009)	0.000	0.050 (0.011)	0.000	0.052 (0.011)	0.000	0.066 (0.013)	0.000
Promotion with same employer in spell t-2	0.041 (0.010)	0.000	0.034 (0.012)	0.006	0.026 (0.012)	0.028	0.054 (0.015)	0.000
Promotion with previous employer in spell t-1	0.014 (0.032)	0.668	0.018 (0.043)	0.676	0.016 (0.039)	0.690	0.033 (0.046)	0.475
Promotion with previous employer in spell t-2	0.026 (0.033)	0.440	-0.015 (0.048)	0.750	0.036 (0.041)	0.378	0.014 (0.050)	0.772
Total Trained t-1	0.006 (0.002)	0.004	0.011 (0.003)	0.000	0.008 (0.003)	0.010	0.001 (0.003)	0.783
Personal, job and workplace characteristics								
Age	0.098 (0.028)	0.000	0.098 (0.028)	0.000	0.213 (0.069)	0.002	0.060 (0.030)	0.045
Age squared	-0.080 (0.003)	0.000	-0.088 (0.005)	0.000	-0.101 (0.006)	0.000	-0.070 (0.004)	0.000
Not married	0.020 (0.008)	0.015	0.028 (0.010)	0.007	0.001 (0.013)	0.944	0.017 (0.010)	0.092
Education: Higher degree	0.290 (0.042)	0.000	0.349 (0.091)	0.000	0.150 (0.051)	0.003	0.434 (0.134)	0.001
Education: First degree	0.184 (0.026)	0.000	0.207 (0.052)	0.000	0.068 (0.039)	0.078	0.350 (0.046)	0.000
Education: Other higher qualification	0.045 (0.013)	0.001	0.030 (0.018)	0.100	0.066 (0.029)	0.021	0.028 (0.016)	0.073

Table 5.7b. Continued

	All		Private sector		Professional		Non-professional	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Education: GCE A level	0.028 (0.017)	0.094	0.042 (0.023)	0.065	0.013 (0.039)	0.733	0.042 (0.019)	0.030
Education: Less than O level or other	-0.008 (0.018)	0.665	0.018 (0.024)	0.452	-0.093 (0.052)	0.074	0.011 (0.020)	0.602
Company size: 25-99	0.071 (0.006)	0.000	0.078 (0.008)	0.000	0.024 (0.010)	0.020	0.079 (0.008)	0.000
Company size: 100-499	0.105 (0.008)	0.000	0.112 (0.010)	0.000	0.062 (0.013)	0.000	0.109 (0.009)	0.000
Company size: over 500	0.111 (0.009)	0.000	0.123 (0.012)	0.000	0.056 (0.013)	0.000	0.126 (0.011)	0.000
Tenure	0.001 (0.000)	0.000	0.001 (0.000)	0.000	0.00023 (0.000)	0.002	0.001 (0.000)	0.000
Part-time job	-0.214 (0.008)	0.000	-0.163 (0.011)	0.000	-0.314 (0.014)	0.000	-0.080 (0.010)	0.000
Temporary contract	-0.081 (0.011)	0.000	-0.106 (0.015)	0.000	-0.180 (0.022)	0.000	-0.060 (0.013)	0.000
Fixed-term contract	-0.050 (0.013)	0.000	-0.099 (0.023)	0.000	-0.088 (0.016)	0.000	-0.071 (0.018)	0.000
No. of hours normally worked per week	0.021 (0.000)	0.000	0.023 (0.000)	0.000	0.007 (0.000)	0.000	0.033 (0.000)	0.000
No. of overtime hours in normal week	0.005 (0.000)	0.000	0.007 (0.001)	0.000	0.002 (0.001)	0.000	0.009 (0.001)	0.000
Union member	0.058 (0.007)	0.000	0.042 (0.011)	0.000	0.032 (0.010)	0.001	0.055 (0.009)	0.000
Constant	1.875 (1.082)	0.083	1.950 (1.033)	0.059	-1.380 (2.692)	0.608	2.576 (1.166)	0.027
Observations	30615		18476		9840		20775	
Number of cross-wave person identifier	5457		4041		2329		4425	
R-squared Within	0.50		0.50		0.39		0.54	

See footnotes to Table 5.3a.

CHAPTER VI

CONCLUSIONS

This last chapter of the thesis presents highlights of some research challenges along with future potential research avenues, and concludes with an overview of the main findings of the analysis conducted in each chapter.

Comparative to extant research, this thesis adds the original insight of intending to focus on the employee side of the story while also keeping research in the fuller context of cross-sector company / workplace analysis. For instance, Chapter IV looks at the impact of HRM practices on both company and employee effort, thereby analysing perceptions of workplace effort and employee effort in relation to the same set of HRM practices and within the same workplace. Moreover, the challenge in analysing attitudinal variables comes from self-reported information, yet the inclusion of attitudinal variables in econometric modelling is on the increase in the labour economic literature.

To counteract the possible imperfect reliability of the data, more than one dataset is used in this thesis at times (e.g. Chapter III uses two datasets) and, reassuringly, comparisons of the patterns shown by attitudinal variables from different datasets tend to reveal similarities. Future availability of more datasets which address research questions aimed at employees, without shying away from the use of attitudinal variables, could continue to improve the picture obtained from this thesis and enhance our understanding of these relatively under-researched aspects in the workplace.

In terms of type of the datasets and the time range of the studies covered in this thesis, both cross-section and panel datasets have been utilised in order to analyse the incidence, scope and impact of HRM practices. Researchers would most likely welcome panel data, for instance by re-running the CERS which has so far only been conducted as a cross-section. The fact that the previously available WERS datasets (WIRS 1980, 1984, 1990) did not contain an employee questionnaire meant that, for the purpose of this thesis, the other WIRS datasets could not have brought more insight into the analysis of employee performance. The recent expansion of the WERS series to include WERS 2004 offers a natural continuation of the research started in this thesis, with WERS04 being only the second WERS dataset comprising an employee questionnaire.

Another suggestion for helping future research is that data contains more in-depth detail about how HRM practices are implemented and the ways in which they are being used. The vast majority of the extant literature works with one-dimensional measures of HRM practices, in spite of there being a potentially strong argument for the importance of measuring the way a practice is implemented. It is however plausible to assume that there is a correlation between the incidence and the effective use of a particular practice. Thus, there is an opportunity for commissioning ample designs of questionnaires which should in future not only probe for the incidence of HRM practices, but also incorporate a measure of the intensity and effectiveness with which these practices are implemented.

Future datasets could also be more generous with their industry-specific observations. This thesis has intentionally amalgamated industry sectors, while

conducting separate research for male vs. female, private vs. public sector, or for employees in professional vs. non-professional qualifications. The main aim of the thesis has been to focus on whether there is an impact of HRM practices on a particular organisational measure, hence it was considered appropriate to use a model that generalised the findings by deliberately including more than one industry sector and occupation. It is believed that the continual expansion of Information Technology, corroborated with renewed interest in the topics covered by this thesis, would lead to the future development of vastly improved datasets, which would allow researchers to conduct more industry-specific analysis without the ubiquitous downside of ending up with too few observations.

A final challenge stems directly from the nature of this research: not having a unanimously accepted definition and measurement of HRM practices. Therefore, setting up a commonly agreed set of definitions and taxonomy for HRM practices could be one of the most difficult challenges faced by future researchers, but, at the same time, one of the most rewarding, informative and constructive.¹⁰¹

Turning to the summary of this thesis, it conducts research into the impact of HRM practices on various aspects of organisational performance in Britain. In view of the fast changing business environment and the growing international competition faced by British firms, corroborated with an ever-expanding set of practices available to HR managers, this thesis aims to expand practitioners' and academics' understanding of the complex ways in which HRM practices can become an effective

¹⁰¹ Researchers at the Advanced Institute of Management (AIM) are presently involved in a project that aims to create a comprehensive list of widely accepted definitions for HRM practices.

tool for increasing job satisfaction and effort, and decreasing stress and the need to work overtime.

As presented in Chapter II, the distinct complexity faced by researchers who attempt to work with HRM practices starts at a most-obvious point: there is no unanimously accepted definition of an “HRM practice”, nor unanimously accepted taxonomy of practices. Therefore, the main challenge is that extant research tends to be unsystematic and does not allow for comparisons, due to inconsistent usage and measurement of HRM practices. Moreover, as shown in the literature review, the main trends exhibited by the extant literature are the predominance of Anglophone research, contingency approaches, disparate attempts to classify HRM practices, different levels of analysis and study designs (Ichniowski *et al* 1996), preference given to quantitative data (especially financial) and neglecting the employees’ insights.

The general conclusion of the literature review is that human resources have a critical and irrefutable role in organisational performance (Arthur 1994; Huselid 1995; Ichniowski, Shaw and Prenzushi 1997). Therefore, there is a fast growing empirical literature aiming to reveal, capture and explain the precise ways in which HRM can be used to increase performance. Despite the large number of studies on this topic, there is yet no universal agreement over the performance impact of single or “bundles” of HRM practices. This thesis attempts therefore to expand the present understanding of HRM practices for the benefit of British employees, employers, policy makers and other researchers. It also adds a rather novel dimension

to the previous research by including in the analysis a large set of attitudinal variables aimed at portraying the impact of HRM practices on employees in Britain.

Chapter III investigates the impact of HRM practices on performance as proxied by self-reported measures of overall job satisfaction, satisfaction with job autonomy and satisfaction with pay. Data is jointly used from two sources, providing a basis of comparison as well as a viable means of constructing a reliable time frame for British organisations at the beginning of the XXI Century. The econometric modelling used takes the form of ordered probit models, supported by binomial probit models for consistency checks. After controlling for a large number of personal, job and firm-related characteristics, several HRM practices raise workers overall job satisfaction and their satisfaction with pay, but these effects are not significant when union differential effects are taken into account. Satisfaction with pay is higher where performance-related pay and seniority-based reward systems are in place. A pay structure that is perceived to be unequal is associated with a substantial reduction in both non-union members' overall job satisfaction and their satisfaction with pay. Although HRM practices can raise worker job satisfaction, if workplace pay inequality widens, some non-union members may experience reduced job satisfaction. Close supervision of work is disliked, but workers enjoy some visual assessment of their performance, suggesting that some monitoring is desirable. Furthermore, giving workers a 'voice' through employee involvement schemes has a positive effect on job satisfaction. Holding regular meetings with employees to enable them to express their views about work is a practice that also has a substantial effect in raising job satisfaction. Especially consistent throughout the study is the finding that workers enjoy on-going learning, job autonomy and working in teams.

Chapter IV analyses the impact of HRM practices on the level of both company and employee effort as perceived by employee and managers separately. Econometric methods used include factor analysis and ordered probit models. Firstly, in terms of supervision and ways of monitoring work quality, the practices that are found to have a consistent positive impact are: setting competency standards and using customer surveys. Secondly, factor analysis is used to identify 3 systems of HRM practices most likely to have an impact on effort, including job control, consultation, performance related pay and employee-paid training. Additionally, training, and communication and consultation appear to have a strong and consistent impact on individual effort, while pay equality, benchmarking and strategic planning play a major role in increasing company effort. Rather controversially, it is found that some practices which decrease the amount of supervised control, such as job autonomy, lead to decreases in individual effort, but working from home is associated with higher individual effort.

Chapter V uses a panel of individuals from the 13 waves of the British Household Panel Survey (1991-2003). It focuses on two workplace practices, training and promotion. Splitting the data by gender, sector and occupation, estimations for probit, bivariate probit, and fixed effects models are obtained in order to analyse the determinants, interrelationships, and wage impact of recent training and promotion with current employer. Inspired by previous research, the chapter outlines a set of four hypotheses related to training and promotion determinants, as well as the wage returns to training and promotion. The main finding is that training and promotion with the same employer are positively associated. Although timing and causation remain unresolved due to the nature of the data available, there is a strong indication of

cherry-picking behaviour by employers. Another consistent result is that training generates further training, especially if previous training was with the current employer. A noteworthy result, breaking apart from previous research, is that the gender discrimination with regard to training access is not observed in the panel based on BHPS data.

With regard to the determinants of current promotion, it is estimated that for both men and women training is significantly associated with the likelihood of promotion and that previous training, one to three years ago, is rather irrelevant for recent promotion. Also, previous promotions (but mostly promotions with current employer for male) generate further promotion. This chapter finds little evidence in support of the expectation that women are discriminated against with regard to promotion prospects with current employer. The difference between genders is modest and statistically insignificant. Results from a bivariate model that assumes endogeneity of training and promotion reinforce the findings from the two independent probit models.

The estimation of the real wage levels as they change over time shows that recent training does not translate into higher wage levels in the same period of time. For both men and women, there is however significant evidence that previous training spells are reflected in higher wages levels. Finally, with regard to returns to recent promotion, wage growth for promoted women is shown to only be lower than for promoted men in the case of women in professional occupations. This finding could hide unobserved discrepancies in the quality of the starting jobs and/or in the level of the labour market entrance wage for women. Both men and women enjoy positive

returns to previous promotions awarded by the current employer. However, neither men nor women who were promoted with a previous employer one to two years ago continue to experience a post-promotion wage effect contemporaneously. This may suggest the prevalence of up-or-out contracts in some organisations, and could imply adverse job switching effects occur.

The broad conclusion of this thesis is that certain practices appear to be contingent to a type of person, job or company characteristic, whereas others, such as training and learning, pay equality, or communication and consultation, tend to have a stronger and consistently positive impact on performance. This thesis can be seen as a stepping stone on the path towards enhancing the existing understanding of the way in which HRM practices impact on performance. Its results can be interpreted as a vivid reminder that future research could continue to investigate this relatively new labour economics area in order for the complexity of the issues involved to become even more transparent.

Every new study into the HRM-performance relationship should be welcome, and action should be taken in order to encourage the further development of research in this area of crucial importance to the future of British organisations. Those who stand to benefit from an increased knowledge, are not only practitioners who can obtain increased productivity and competitiveness, but also employees who can work in a more satisfactory and performance-enhancing environment. Thus, the research agenda supported by this thesis can also contribute to the wider aim of creating a stronger economy and achieving higher societal well-being.

**APPENDIX
Appendix A**

Appendix A.1 Suggesting a taxonomy of performance measures
(source: Kleiner *et al* 1987 : 323)

<i>Labour Quality</i>	<i>Intermediate Outputs</i>	<i>Outputs</i>	<i>Outcomes</i>
- Job satisfaction	- Increased product quality	- Sales	- Capital market assessments
- Employee participation	- Increased productivity	- Revenues - Profits (pre and post-tax returns on investment, returns on assets, stock price)	- Market share - Stature and reputation

Appendix A.2 Suggesting a taxonomy of HRM measures using the 'HR practices spectrum' (adapted from Parks 1995)

<i>Traditional</i>	<i>Alternative</i>
positive rational individual mechanistic assumptions and deduction scientific how to resolve conflicting interests	normative values based community/culture environment/organic description and induction holistic how to determine cooperative solutions

Appendix A.3 Attempting a taxonomy of HRM measures using work organisation
(source: Hunter and Hit 2001 : 33)

	<i>Low Flexibility</i>	<i>High Flexibility</i>
<i>Low Discretion</i>	Taylorist Bureaucracy	Cross-Trained Group
<i>High Discretion</i>	High-Discretion Specialists	High-Performance Workplace

Appendix A.4 Attempting a taxonomy of HRM measures using the architectural approach to HRM (source: Wright and Gardner 2000 and from Becker and Gerhart 1996 : 786)

<i>Guiding principles</i>	<i>Policy/practice alternatives</i>	<i>Product</i>	<i>Practice-process</i>
performance based pay	bonuses, merit pay, stock options, gain-sharing, profit sharing, piece-rate pay	pay tied to: cost cutting, innovation, revenue growth, profit growth, market share	assessed by: valid objective measures, 360 degree appraisal process, supported by selection systems, training systems

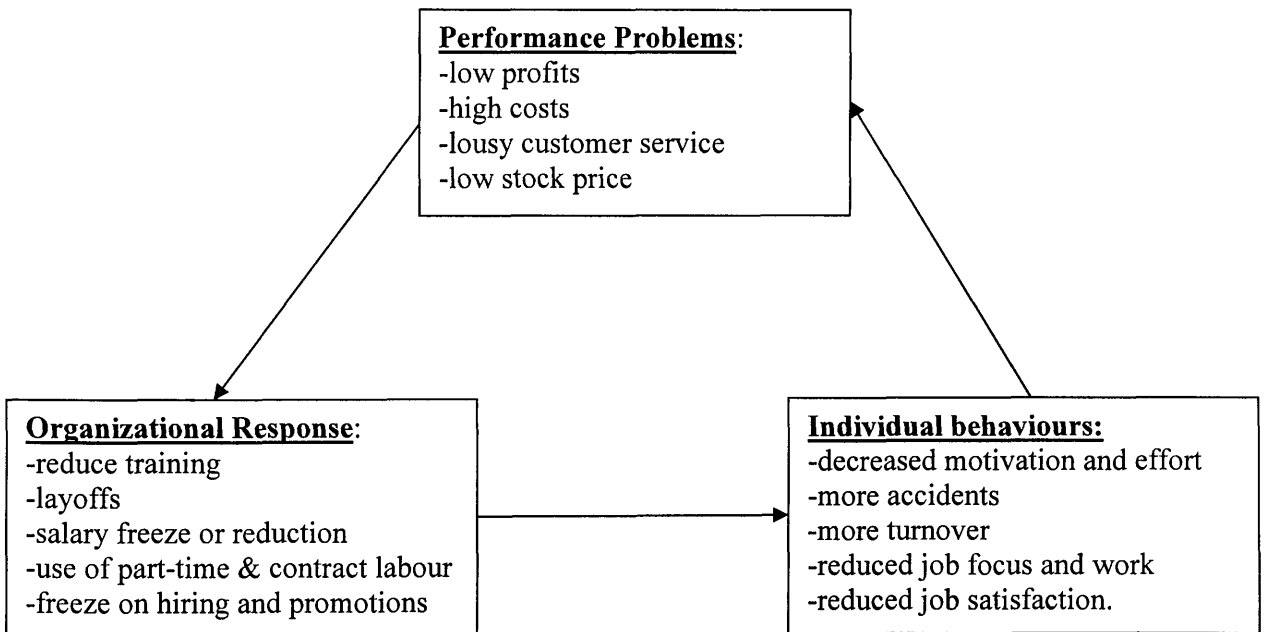
Appendix A.5 Attempting a taxonomy of HRM measures using a hierarchy of four HRM systems of practices
(adapted from: Ichniowski *et al* 1997 : 296 - 298)

<i>HRM system 1:</i>	<i>HRM system 2:</i>	<i>HRM system 3:</i>	<i>HRM system 4:</i>
<i>Traditional (no innovative practices)</i>	<i>Like HRM system 1, but with improvements in:</i>	<i>Like HRM system 2, (lacking one or more of the practices between brackets) but with improvements in:</i>	<i>Most innovative, incorporates innovative HRM practices in all areas</i>
close supervision	initiation of worker involvement	high level of worker involvement	high level of worker involvement
strict work rules and narrow job responsibilities	<i>like HRM system 1</i>	(lack of job rotation or reduced job classifications)	job duties covering wide range of tasks and job rotation
incentive pay based on quantity of output	<i>like HRM system 1</i>	(lack of multi-attribute incentive pay)	multi-attribute incentive pay plan or a 'pay-for-knowledge' incentive pay system
no teamwork	initiation of teamwork	teamwork	multiple problem-solving teams
no labour-management regular meetings or communication of financial information	enhancement of labour-management communication	labour-communication	regular information sharing between workers and management
no screening	<i>like HRM system 1</i>	(lack of extensive screening)	extensive screening of new workers, often lasting one year
no off-line or other formal training	<i>like HRM system 1</i>	extensive skills training	off-line training in technical skills and team problem solving
no job security	<i>like HRM system 1</i>	(lack of job security)	an implicit employment security pledge

Appendix A.6 Seven practices of successful organisations
(adapted from Pfeffer 1998, Chapter 3)

1. Selective hiring of new personnel;
2. Job security;
3. Extensive training;
4. Self-managed teams and decentralisation of decision-making as the basic principles of organisational design;
5. Reduced status distinctions and barriers (including dress, language, office arrangements, and wage differences across levels);
6. Comparatively high compensation contingent on organisational performance;
7. Extensive sharing of financial and performance information throughout the organisation.

Appendix A.7 'The downward performance spiral'
(adapted from Pfeffer 1998)



Appendix A.8 Changes in the management of employees in Britain as reflected by the WIRS series (1980-1998) (source: Cully *et al* 1999):

1. the presence of a personnel specialist - the number of workplaces with a personnel specialist increase by a third in the past decade;
2. lower integration of employee relations with strategic objectives as the number of workplaces with a personnel specialist on board fell from nearly a half in 1990 (47%) to a little more than a third in 1998 (36%) Cully *et al* 1999 : 225;
3. the roles of specialists and non-specialist remained different (specialists are more likely to deal with pay or conditions for employment and less likely to deal with training), with little change in specialists' roles, and an increase in responsibilities for non-specialists (especially increase in pay, conditions for employment and grievances);
4. communication with the workforce. Systematic use of the management chain for communicating with employees was the most used channel of communication. Second most used channel was newsletters distributed to all employees. These two channels continued to be the most used in the survey series;
5. no major changes in information given to employees. A slow increase in distributing information about the financial position of the workplace and of the organization was noticed. However, there remained workplaces were, according to managers, very little information was shared (Cully *et al* 1999 : 231);
6. financial participation: only the incidence of profit-sharing and of share ownership schemes is explored and it is found to have declined in the 1990s;
7. trade unions: unionised workplaces (halved), trade union memberships (halved) union recognition (fallen by a third), compulsory union membership arrangements disappeared (e.g. the closed shop was made illegal during the past decade). However, union representation has a constant presence in the past decade (Cully *et al* 1999 : 246);
8. workplace conflict - decreased sharply to an average number of industrial actions of only 2 in 100 workplaces and 6% of workplaces experiencing industrial action of any kind in the past five years (Cully *et al* 1999 : 298).

Appendix B

Appendix B.1. Comparison of WERS 1998 and CERS 2000 datasets (only aspects where differences occur are presented here below)

	WERS	CERS
<i>Number of observations</i>	28,420	2,132
Individual characteristics		
1. Age	<ul style="list-style-type: none"> • WERS contains slightly more young respondents (age less than 24): 11% compared to 7 % in CERS; • WERS has less people in the lower-prime age group (41%) as opposed to CERS (46%); • Otherwise, the age distributions are similar, with the majority of people being in their lower-prime years. 	
2. Gender	49.14% male	47.89% male
3. Highest educational qualification	<ul style="list-style-type: none"> • WERS and CERS samples include exactly the same percentage of respondents with no educational qualification (22%), and with less than an A-level qualifications (37%). In both datasets, the latter is the largest group; • However, WERS contains a lower percentage of respondents with degrees or higher degrees (25% in WERS as opposed to CERS 31%), and has relatively more respondents with A-level than CERS (16% in WERS as opposed to 10% in CERS). 	
4. Level of skill	<p>At a first glance, the distributions of respondents in both sample seems similar:</p> <ul style="list-style-type: none"> - the largest group: intermediate, managerial or technical positions; and - the smallest group: the unskilled. <p>However, WERS has a more evenly spread distribution (lower kurtosis) as opposed to CERS. This becomes evident, for instance, by a more-than-double difference in the percentages of respondents at the two extremes:</p> <ul style="list-style-type: none"> - there are more professionals in WERS (WERS 17%, CERS 7%); and - there are more unskilled in WERS (WERS 10%, CERS 4%). 	
5. Union membership	Relatively more respondents in WERS (41%) than in CERS (31%) are union members.	
Workplace characteristics		
<p>Workplace size: WERS includes more large workplaces than CERS.</p> <ul style="list-style-type: none"> • 54% of workplaces in WERS employ over 100 employees compared to only 39% in CERS. • The largest group of workplaces, by size, has between 100 and 500 employees (40%) in WERS. By contrast, in the CERS sample, the workplace size distribution peaks both at the 'between 100 and 500' size level (19.75% workplaces) and at the 'between 0 and 10' workplace size level (20.03%). <p>These differences are explained by the design of the WERS survey. Unlike CERS, which has the advantage of including all sizes of workplaces, WERS survey is limited to workplaces employing > 10 employees. This is one of the drawbacks of WERS. Hence, the study of CERS can be seen as completing the view offered by WERS with regard to the base variable in the models, namely workplace size between 0 and 10 employees.</p>		

**Appendix B.2 Sample means and standard deviations,
CERS (Overall satisfaction)**

	Mean	Standard Deviation
HRM PRACTICES		
<i>Work organisation & supervision</i>		
Working in groups or teams	0.59	0.49
Individual performance differentiated from peer	0.78	0.41
Employee can be seen all the time by supervisor or manager	0.50	0.50
Work progress can be visually assessed	0.53	0.50
<i>Employee involvement / voice</i>		
Information is disseminated in workplace	0.78	0.41
Employee is part of an improvement group	0.30	0.46
Workplace has a formal suggestion scheme	0.36	0.48
Management holds meetings where employees can express their views	0.69	0.46
<i>Recruitment & selection</i>		
Initial pay is negotiable	0.29	0.45
<i>Training & learning</i>		
Education or training paid by employer in the past 2 years	0.52	0.50
Job requires on-going learning	0.83	0.38
<i>Seniority-based pay</i>		
Pay is related to tenure	0.40	0.49
<i>Performance-related pay</i>		
Incentive payment based on own performance	0.22	0.42
Incentive payment based on team performance	0.17	0.37
Incentive payment based on company performance	0.26	0.44
Participating in a profit-share scheme or share (option) scheme	0.15	0.36
<i>Perception of own pay</i>		
own pay is relatively high	0.09	0.29
own pay is reasonably similar	0.58	0.49
own pay is relatively low	0.32	0.47
<i>Effect of perceived workplace inequality on performance</i>		
pay gap is much too big	0.22	0.42
pay gap is too big	0.29	0.45
pay gap is about right	0.45	0.50
pay gap is too small	0.03	0.18
pay gap is much too small	0.01	0.07

Appendix B.2 (continued)

	Mean	Standard Deviation
EMPLOYEE, JOB AND WORKPLACE CHARACTERISTICS		
<i>Employee characteristics</i>		
Age	39.05	10.60
Age squared	1636.88	848.87
Gender (male=1)	0.48	0.50
Marital status		
Married, living with spouse	0.65	0.48
Separated, or divorced, or widowed	0.14	0.34
Single	0.22	0.41
Number of children under 16 living with respondent		
One child	0.19	0.40
Two children	0.17	0.38
More than two children	0.06	0.24
No children	0.57	0.50
Highest educational qualification		
Degree or higher degree	0.31	0.46
A-level (or equivalent)	0.10	0.30
Less than A-level	0.37	0.48
no qualification	0.31	0.46
Level of skill		
Professional	0.10	0.30
Managerial and technical	0.31	0.46
Skilled non-manual	0.24	0.43
Skilled manual	0.19	0.39
Partly skilled/semi-skilled	0.15	0.36
Unskilled	0.04	0.20
Union member	0.31	0.46
<i>Job characteristics</i>		
Contract status		
Permanent full-time	0.71	0.45
Permanent part-time	0.20	0.40
Fixed term, temporary	0.09	0.28
<i>Workplace characteristics</i>		
Size (number of employees)		
> 1000	0.12	0.32
500 – 999	0.07	0.25
100 – 499	0.20	0.40
50 – 99	0.11	0.31
25 – 49	0.15	0.35
20 – 24	0.07	0.25
11 – 19	0.09	0.29
< 10	0.20	0.40
Sector		
Public	0.31	0.46
Private	0.65	0.48
Other	0.04	0.20

Appendix B.3 Sample means and standard deviations

	CERS		WERS	
	Mean	St. dev.	Mean	St. dev.
HRM PRACTICES				
<i>Work organisation & supervision</i>				
Teamwork	0.60	0.49	0.89	0.31
Supervision of work progress	0.52	0.50	0.27	0.44
Constant supervision	0.50	0.50	Na	na
<i>Employee involvement / voice</i>				
<i>Information dissemination</i>				
Notice boards	0.58	0.49	0.93	0.26
newsletter or magazine	0.62	0.49	0.75	0.43
email or website	0.42	0.49	0.49	0.50
<i>Involvement in decision making</i>				
improvement groups	0.33	0.47	0.50	0.50
Formal suggestion schemes	0.39	0.49	0.28	0.45
meetings where employees can express their views	0.71	0.45	0.87	0.34
<i>Recruitment & selection</i>				
Management asks employees about pay	0.29	0.45	0.27	0.44
<i>Training & learning</i>				
Both training and skill development are encouraged	0.50	0.50	0.39	0.49
Either training or skill development is encouraged	0.39	0.49	0.38	0.49
Neither training nor skill development are encouraged	0.11	0.31	0.23	0.42
<i>Seniority-based pay</i>				
Pay based on tenure	0.40	0.49	0.52	0.50
Performance-related pay	Na	Na	0.27	0.44
Own performance	0.24	0.43	na	na
Team performance	0.19	0.39	na	na
Company performance	0.29	0.46	na	na
Profit sharing/ option schemes	0.17	0.38	0.45	0.50
<i>Perceived workplace inequality</i>				
Pay gap is small	Na	Na	0.01	0.12
pay gap is much too big	0.23	0.42	na	na
pay gap is too big	0.29	0.45	na	na
pay gap is about right	0.48	0.50	na	na
pay gap is too small	0.02	0.17	na	na
pay gap is much too small	0.01	0.07	na	na
<i>Job autonomy – influence over...</i>				
job tasks	0.64	0.48	0.66	0.47
pace of work	0.79	0.41	0.71	0.45
how job is done	0.45	0.50	0.85	0.36

Appendix B.3 (continued)

	CERS		WERS	
	Mean	St. dev.	Mean	St. dev.
EMPLOYEE, JOB AND WORKPLACE CHARACTERISTICS				
<i>Employee characteristics</i>				
Age 18 – 24	0.08	0.27	0.11	0.32
25 – 39	0.47	0.50	0.43	0.49
40 – 49	0.25	0.43	0.26	0.44
50 or over 50	0.21	0.40	0.20	0.40
Gender (1=male)	0.50	0.50	0.52	0.50
Married living with spouse	0.64	0.48	0.70	0.46
Separated, divorced, or widowed	0.14	0.34	0.08	0.27
Single	0.23	0.42	0.22	0.42
No children	0.58	0.49	0.59	0.49
One child	0.20	0.40	0.30	0.46
Two children	0.17	0.37	0.11	0.31
More than two children	0.05	0.23	0.01	0.07
Degree or higher degree	0.33	0.47	0.28	0.45
A-level or equivalent	0.10	0.31	0.17	0.38
Qualification less than A-level	0.36	0.48	0.37	0.48
No qualification	0.20	0.40	0.19	0.39
Professional	0.07	0.25	0.18	0.38
Managerial/intermediate technical	0.34	0.47	0.22	0.42
Skilled non-manual	0.23	0.42	0.21	0.41
Skilled manual	0.18	0.39	0.15	0.36
Partly skilled /semi-skilled	0.14	0.35	0.15	0.36
Unskilled	0.03	0.18	0.08	0.28
Union member	0.35	0.48	0.40	0.49
<i>Job characteristics</i>				
Permanent full-time contract	0.76	0.43	0.75	0.43
Permanent part-time	0.17	0.37	0.17	0.38
Not permanent	0.07	0.26	0.08	0.27
<i>Workplace characteristics</i>				
Workplace size (No. of employees)				
> 1000	0.13	0.34	0.05	0.22
500 – 999	0.08	0.27	0.09	0.28
100 – 499	0.21	0.41	0.40	0.49
50 – 99	0.11	0.32	0.19	0.40
25 – 49	0.14	0.34	0.19	0.39
20-24	0.06	0.23	0.03	0.18
10-19	0.09	0.29	0.04	0.21
1-10	0.18	0.39	na	na
Public sector workplace	0.31	0.46	0.34	0.47
Private sector	0.65	0.48	0.39	0.49
Other	0.04	0.21	0.28	0.45

Appendix B.4 Construction of the HRM variables from CERS and WERS

<i>Work organisation and supervision</i>	
CERS: Teamwork: employee is part of a team WERS: Teamwork incidence in the workplace	Employee is asked: Excluding any supervisor or manager you work for, do you usually work in a group or team with two or more other people? HR Manager is asked: What proportion, if any, of [employees in the largest occupational group] at this workplace work in formally designated teams? Coded 1 for teamwork, 0 for no employees working in teams.
CERS: Employee reports that work progress can be visually assessed WERS: Supervision of work progress used as a practice in the workplace	Employee is asked: Most of the time, can your supervisor or manager tell at a glance how your work is progressing? HR Manager is asked: what are the main methods by which logs are made aware of their job responsibilities? Coded 1 for supervision amongst the first three answers to this question (i.e. amongst the main three methods used in the organisation).
CERS: Employees report they can be seen all the time by supervisor or manager WERS: -	Employee is asked: Do you carry out your work in a place where you can be seen all the time by a supervisor or manager? Variable not available in the dataset.
<i>Employee involvement/ voice</i>	
<i>Information dissemination</i>	
CERS: notice boards WERS: notice boards	Employee is asked: Does your employer give you news of what is happening in the organisation by any of the methods on this card? notice boards Employee is asked: How helpful do you find the following in keeping up-to-date about this workplace? notice boards Coded 1 if notice boards are used, 0 if notice boards are 'not used here'
CERS: newsletter or magazine: combination of WERS: newsletter or magazine	Employee is asked: Does your employer give you news of what is happening in the organisation by any of the methods on this card? news-sheet, internal newspaper or magazine Employee is asked: How helpful do you find the following in keeping up-to-date about this workplace? newsletters or magazines Coded 1 if newsletters or magazines are used, 0 if newsletters or magazines are 'not used here'
CERS: e-mail or website WERS: e-mail	Employee is asked: Does your employer give you news of what is happening in the organisation by any of the methods on this card? web-site or internal e-mails Employee is asked: How helpful do you find the following in keeping up-to-date about this workplace? e-mail Coded 1 if notice e-mail is used, 0 if e-mail is 'not used here'.
<i>Involvement in decision making</i>	
CERS: Employee as part of an improvement group WERS: Incidence of improvement groups in the workplace	Employee is asked: Some organisations have groups of employees who meet regularly to think of improvements that could be made within the organisation. Are you involved in such a group? HR manager is asked: Do you have groups at this workplace that solve specific problems or discuss aspects of performance or quality? They are sometimes known as quality circles or problem-solving groups or continuous improvement groups.
CERS: Workplace has a formal suggestion scheme WERS: Workplace has a formal suggestion scheme	Employee is asked: Does your employer have a formal suggestion scheme? HR manager is asked: Do you have any channels through which employees can make suggestions for improving working methods? Coded 1 for suggestion schemes.

Appendix B.4 (continued)

<p>CERS: Management holds meetings were employees can express their views</p> <p>WERS: Management holds meetings were employees can express their views</p>	<p>Employee is asked: Does management hold meetings in which you can express your views about what is happening in the organisation?</p> <p>A combination of:</p> <p>Employee is asked: How helpful do you find the following in keeping up-to-date about this workplace? meetings of managers and employees Coded 1 if notice meetings are used, 0 if meetings are 'not used here'. and</p> <p>Employee is asked: How good would you say managers here are at the following: providing everyone with the chance to comment on proposed changes? Coded 1 for 'very good' and 'good', 0 for the rest. The combined variable is coded 1 if both variables above are 1.</p>
<p><i>Financial involvement, Recruitment & selection</i></p>	
<p>CERS: Employee is part of a profit-share scheme or share (option) scheme</p> <p>WERS: Incidence of profit-sharing scheme or share ownership schemes in the workplace</p> <p>CERS: Initial pay is negotiable</p> <p>WERS: Frequency of being asked about pay issues</p>	<p>Employee is asked: Do you participate in profit-sharing scheme or share (option) scheme?</p> <p>HR manager is asked: Do any employees at this workplace receive payments or dividends from any of the following variable pay schemes? 1. Profit-related payments or bonuses 2. Deferred profit sharing scheme 3. Employee share ownership schemes Coded 1 if 'yes' at any of the three above.</p> <p>Employee is asked: When you entered your present job, were you able to negotiate personally with your employer over the pay they were offering you?</p> <p>Employee is asked: How often are you and others working here asked by managers for your views on the following? pay issues Coded 1 for frequently and sometimes, 0 for hardly ever and never.</p>
<p><i>Training & learning</i></p>	
<p>CERS: Both/ Either/ Neither training and skill development are encouraged : education or training paid by employer in the past 2 years</p> <p>job requires on-going learning</p> <p>WERS: Both/ Either/ Neither training and skill development are encouraged training paid or organised by the employer in the last year</p> <p>encouragement of skill development in the workplace</p>	<p>Combination of the variables in the two rows below:</p> <p>Employee is asked: Have you received any education or training provided or paid for by your current employer, in the last 2 years? Please include any education or training which is still continuing. Employee is asked: Statements about job: My job requires that I keep learning new things. Combination of the variables in the two rows below:</p> <p>Employee is asked: During the last 12 months, how much training have you had, either paid for or organised by your employer? Coded 1 for any training, 0 for none.</p> <p>Employee is asked: Do you agree or disagree, with the following statements about working here? people working here are encouraged to develop their skills Coded 1 for strongly agree and agree, 0 for the rest.</p>

Appendix B.4 (continued)

<i>Pay practices</i>	
<i>Seniority-based pay</i>	
<p>CERS: Use of pay based on tenure in the workplace WERS: Use of pay structures based on tenure in the workplace</p>	<p>Employee is asked: How true is it that the organisation rewards employees who have worked there a long time? HR manager is asked: Which, if any, of the factors listed on this card explain the differences between actual pay levels of fulltime [employees in the largest group] at this workplace? age of employees, years of service</p>
<i>Performance-related pay</i>	
<p>CERS: Performance-related pay Incentive payment based on own performance Incentive payment based on team performance Incentive payment based on company performance WERS: Incidence of performance-related pay in the workplace</p>	<p>Employee is asked: Do you receive any incentive payment, bonus or commission based on your own performance? Employee is asked: Do you receive any incentive payment, bonus or commission based on team performance? Employee is asked: Do you receive any incentive payment, bonus or commission based on organisational performance? HR manager is asked: Do any employees at this workplace receive payments or dividends from any of the following variable pay schemes? Individual or group performance-related schemes</p>
<i>Perceived workplace inequality</i>	
<p>CERS: Pay equality WERS: Pay equality</p>	<p>Employee is asked: Thinking of the highest and the lowest paid people at your place of work, how would you describe the gap between their pay, as far as you know? Pay gap is much too big / pay gap is too big / pay gap is about right / pay gap is too small / pay gap is much too small HR manager is asked: Which, if any, of the factors listed on this card explain the differences between actual pay levels of fulltime [employees in the largest group] at this workplace? None. If 'none' above, checking again: So, all full-time [employees in the largest group] receive the same amount of pay? Coded 1 if the answer is Yes.</p>
<i>Perception of relative income</i>	
<p>CERS: Perception of relative income: WERS: -</p>	<p>Employee is asked: How would you describe wages or salary paid? own pay is relatively high / own pay is reasonably similar / own pay is relatively low. Variable not available in the dataset.</p>
<i>Job autonomy- influence over</i>	
<p>CERS: job tasks WERS: job tasks CERS: pace of work WERS: pace of work CERS: how job is done WERS: how job is done</p>	<p>Employee is asked: Do you decide the specific tasks that you carry out from day to day or does someone else? Coded 1 for employee, 0 for someone else. Employee is asked: In general, how much influence do you have about the following: the range of tasks you do in your job Coded 1 for 'a lot' and 'some', 0 for the 'a little' and 'none'. Employee is asked: Does someone else decide how much work you do or how fast you work during the day? Coded 1 for employee, 0 for someone else. Employee is asked: Employee is asked: In general, how much influence do you have about the following: the pace at which you work Coded 1 for 'a lot' and 'some', 0 for the 'a little' and 'none'. Employee is asked: Is yours a job which allows you to design and plan important aspects of your own work or is your work largely defined for you? Coded 1 for yes. Employee is asked: In general, how much influence do you have about the following: how you do your work Coded 1 for 'a lot' and 'some', 0 for the 'a little' and 'none'.</p>

Appendix B.5 Construction of dependent variables in CERS and in WERS, for the binary and ordinal probit models

Panel 1 The distribution of overall job satisfaction: original and recoded variables (CERS)

Original dataset variable			Binomial variable			Ordinal variable		
Value and answer	Obs.	%	Value	Obs.	%	Value	Obs.	%
1 Completely satisfied	230	10.79	1 satisfied	1,791	84.01	5	230	10.79
2 Very satisfied	730	34.24				4	730	34.24
3 Satisfied	831	38.98				3	831	38.98
4 Neutral	164	7.69	0 neutral or not satisfied	331	15.53	2	164	7.69
5 Dissatisfied	117	5.49				1	167	7.84
6 Very dissatisfied	26	1.22				dis- satisfied	167	7.84
7 Completely dissatisfied	24	1.13	missing	10	0.47	missing	10	0.47
8 No answer or 'I don't know'	10	0.47				missing	10	0.47
Total	2,132	100.00		2,132	100.00		2,132	100.00
Mean	2.73		0.74			3.33		
Standard deviation	1.18		0.36			1.03		

Panel 2 The distribution of satisfaction with pay: original and recoded variables (CERS)

Original dataset variable			Binomial variable			Ordinal variable		
Value and answer	Obs.	%	Value	Obs.	%	Value	Obs.	%
1 Completely satisfied	59	2.77	1 satisfied	1,250	58.63	5	59	2.77
2 Very satisfied	215	10.08				4	215	10.08
3 Satisfied	976	45.78				3	976	45.78
4 Neutral	301	14.12	0 neutral or not satisfied	869	40.76	2	301	14.12
5 Dissatisfied	403	18.90				1	568	26.64
6 Very dissatisfied	101	4.74				dis- satisfied	568	26.64
7 Completely dissatisfied	64	3.00	missing	13	0.61	missing	13	0.61
8 or 9 No answer or 'I don't know'	13	0.61				missing	13	0.61
Total	2,132	100.00		2,132	100.00		2,132	100.00
Mean	3.66		0.59			2.48		
St. dev.	1.34		0.49			1.08		

Panel 3 The distribution of satisfaction with pay: original and recoded variables (WERS)

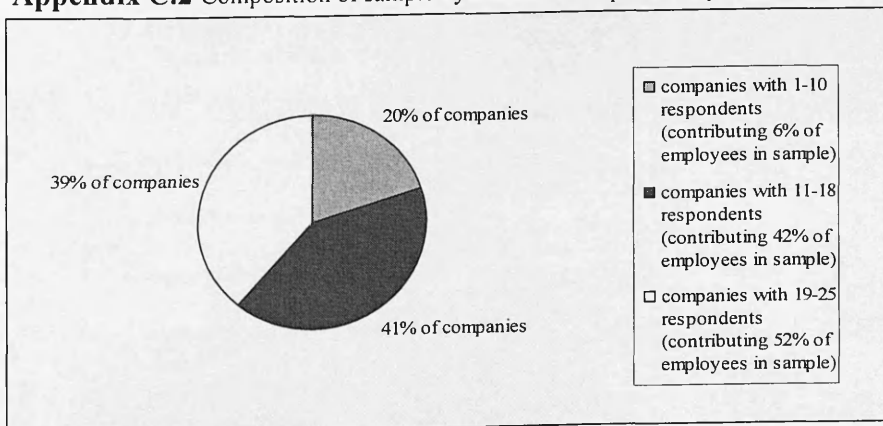
Original dataset variable			Binomial variable			Ordinal variable		
Value and answer	Obs.	%	Value	Obs.	%	Value	Obs.	%
1 Very satisfied	969	3.43	1 satisfied	9,972	35.34	5	969	3.43
2 Satisfied	9,003	31.91				4	9,003	31.91
3 Neutral	6,561	23.25	0 neutral or not satisfied	17,917	63.49	3	6,561	23.25
4 Dissatisfied	7,879	27.92				2	7,879	27.92
5 Very dissatisfied	3,477	12.32	missing	326	1.16	1	3,477	12.32
6 or 7 No answer or 'I don't know'	326	1.16				missing	326	1.16
Total	28,215	100.00		28,215	100.00		28,215	100.00
Mean	3.04		0.36			3.15		
St. dev.	1.58		0.48			1.12		

Appendix C

Appendix C.1 Sample composition by number of respondents per workplace (WERS)

Number of respondents per company	COMPANIES			EMPLOYEES		
	Number of companies where only (n) employees responded	% in Total Company Sample	Cumulative %	Total respondents from companies with (n) respondents	% in Total Employee Sample	Cumulative %
(n)	(A)	(B)	(C)	(D) = (n)x(A)	(E)	(F)
1	23	1.29	1.29	23	0.08	0.08
2	18	1.01	2.30	36	0.13	0.21
3	23	1.29	3.59	69	0.24	0.45
4	27	1.52	5.11	108	0.38	0.84
5	22	1.23	6.34	110	0.39	1.23
6	37	2.08	8.42	222	0.79	2.01
7	49	2.75	11.17	343	1.22	3.23
8	35	1.96	13.13	280	0.99	4.22
9	49	2.75	15.88	441	1.56	5.78
10	74	4.15	20.03	740	2.62	8.41
11	59	3.31	23.34	649	2.30	10.71
12	64	3.59	26.94	768	2.72	13.43
13	62	3.48	30.42	806	2.86	16.29
14	95	5.33	35.75	1,330	4.71	21.00
15	94	5.27	41.02	1,410	5.00	26.00
16	113	6.34	47.36	1,808	6.41	32.40
17	131	7.35	54.71	2,227	7.89	40.30
18	117	6.57	61.28	2,106	7.46	47.76
19	141	7.91	69.19	2,679	9.49	57.26
20	112	6.29	75.48	2,240	7.94	65.20
21	127	7.13	82.60	2,667	9.45	74.65
22	113	6.34	88.95	2,486	8.81	83.46
23	94	5.27	94.22	2,162	7.66	91.12
24	70	3.93	98.15	1,680	5.95	97.08
25	33	1.85	100.00	825	2.92	100.00
Total	1,782 companies	100 %		28,215 respondents	100%	

Appendix C.2 Composition of sample by number of respondents per workplace



Appendix C.3 Variable definitions and means. Ctnd.

HRM practices (Independent variables)	Type of variable	Obs.	Mean	St. Dev.	Min	Max
Mgr.: Job descriptions (used to make emps. aware of job responsibilities)	2 Work organisation: 1	28126	0.75	0.44	0	1
Mgr.: Staff manual (used to make emps. aware of job responsibilities)	2 Work organisation: 1	28135	0.58	0.49	0	1
Mgr.: Standard operational procedures (used to make emps. aware of job responsibilities)	2 Work organisation: 1	28154	0.64	0.48	0	1
Mgr.: Team objectives (used to make emps. aware of job responsibilities)	2 Work organisation: 1	28126	0.43	0.49	0	1
Mgr.: Teamwork in over 60% of staff	2 Work organisation: 1	28104	0.72	0.45	0	1
Mgr.: Workplace has strategic plan	2 Work organisation: 1	28113	0.86	0.35	0	1
Mgr.: Workplace uses benchmarking	2 Work organisation: 1	27913	0.55	0.50	0	1
Mgr.: Workplace uses just-in-time systems	2 Work organisation: 1	27854	0.29	0.45	0	1
Mgr.: Quality monitored via customer surveys	2 Work organisation: 2	28173	0.58	0.49	0	1
Mgr.: Quality monitored via external auditors	2 Work organisation: 2	28173	0.05	0.22	0	1
Mgr.: Quality monitored via individual employees	2 Work organisation: 2	28173	0.59	0.49	0	1
Mgr.: Quality monitored via inspectors	2 Work organisation: 2	28173	0.49	0.50	0	1
Mgr.: Quality monitored via manager/supervisor	2 Work organisation: 2	28173	0.91	0.28	0	1
Mgr.: Quality monitored via records on fault/complaints	2 Work organisation: 2	28173	0.69	0.46	0	1
Mgr.: Supervision (used to make empl. aware of job responsibilities)	2 Work organisation: 2	28171	0.85	0.36	0	1
Emp.: Mgt. keeps every one up to date with changes	3 Communication	27513	0.44	0.50	0	1
Emp.: Mgt. responds to employee suggestions	3 Communication	26665	0.33	0.47	0	1
Mgr.: Communication or consultation via meetings	3 Communication	28204	0.39	0.49	0	1
Mgr.: Empls. informed about establishment finance	3 Communication	28191	0.73	0.44	0	1
Mgr.: Empls. informed about internal investment plans	3 Communication	28194	0.59	0.49	0	1
Emp.: Information dissemination: newsletter, email or noteboard	3 Communication	27853	0.96	0.20	0	1

Appendix C.3 Variable definitions and means. Ctnd.

HRM practices (Independent variables)	Type of variable	Obs.	Mean	St. Dev.	Min	Max
Mgr.: Briefings are used	3 Communication	28169	0.91	0.29	0	1
Mgr.: Quality/Problem-solving/Cont. Improv. Groups are used	3 Communication	28155	0.50	0.50	0	1
Mgr.: Suggestion schemes used	3 Communication	28215	0.28	0.45	0	1
Emp.: Consulted over at least one job aspect	3 Consultation	28051	0.53	0.50	0	1
Mgr.: Not making changes without consulting with employees	3 Consultation	28192	0.72	0.45	0	1
Mgr.: A change in organisational performance had an upward effect on pay	4 Pecuniary other than wage	27199	0.61	0.49	0	1
Mgr.: 4 weeks or more paid annual leave available	4 Pecuniary other than wage	28210	0.93	0.26	0	1
Mgr.: Employer pension scheme available	4 Pecuniary other than wage	28210	0.83	0.37	0	1
Mgr.: Pay varies according to: hours worked	4 Pecuniary other than wage	28116	0.70	0.46	0	1
Mgr.: Pay varies according to: skill/core competencies	4 Pecuniary other than wage	28133	0.86	0.34	0	1
Mgr.: Pay varies according to: tenure	4 Pecuniary other than wage	28133	0.51	0.50	0	1
Mgr.: Performance related pay	4 Pecuniary other than wage	28193	0.26	0.44	0	1
Mgr.: Profit-related pay, Profit sharing or ESOP	4 Pecuniary other than wage	28193	0.43	0.50	0	1
Mgr.: Workplace has pay equality	4 Pecuniary other than wage	28141	0.02	0.13	0	1
Emp.: Has job autonomy	5 Non-pecuniary: 1 flexibility	28215	0.54	0.50	0	1
Emp.: Flexible working hours available	5 Non-pecuniary: 1 flexibility	27666	0.34	0.47	0	1
Emp.: Job sharing available	5 Non-pecuniary: 1 flexibility	27666	0.18	0.38	0	1
Emp.: Parental leave available	5 Non-pecuniary: 1 flexibility	27666	0.28	0.45	0	1
Emp.: Working at home available	5 Non-pecuniary: 1 flexibility	27666	0.11	0.32	0	1
Mgr.: Emps. have job control	5 Non-pecuniary: 1 flexibility	28102	0.62	0.48	0	1
Mgr.: Option of working from home available	5 Non-pecuniary: 1 flexibility	28180	0.47	0.50	0	1
Mgr.: Emps. have guaranteed job security	5 Non-pecuniary: 2 job security	28093	0.17	0.37	0	1

Appendix C.3 Variable definitions and means. Ctn.

HRM practices (Independent variables)	Type of variable	Obs.	Mean	St. Dev.	Min	Max
Mgr.: Company car or car allowance available	5 Non-pecuniary: 3 more recent policies	28215	0.20	0.40	0	1
Mgr.: Private health insurance available	5 Non-pecuniary: 3 more recent policies	28215	0.18	0.38	0	1
Mgr.: Sick pay in excess of statutory available	5 Non-pecuniary: 3 more recent policies	28215	0.80	0.40	0	1
Emp.: Either training or skill development is encouraged	6 Training	27210	0.38	0.49	0	1
Emp.: Neither training nor skill development is encouraged	6 Training	27210	0.28	0.42	0	1
Mgr.: Induction (used to make emps. aware of job responsibilities)	6 Training	28135	0.83	0.37	0	1
Mgr.: Over 40% of staff had off-the-job training	6 Training	27750	0.55	0.50	0	1
Mgr.: Recruitment tests are used	6 Training	28180	0.33	0.47	0	1
Mgr.: Workplace accredited as an Investor in People	6 Training	27391	0.35	0.48	0	1
Mgr.: Over 60% of supervisors trained in people mgt. skills	6 Training	25532	0.42	0.49	0	1

Appendix C.4 Variable definitions and means: employee, job and workplace characteristics

Employee, job and workplace characteristics	Obs.	Mean	St. Dev.	Min	Max
Emp.: Female	28161	0.51	0.50	0	1
Emp.: Young (16-24)	28153	0.11	0.32	0	1
Emp.: Lower prime (25-39)	28153	0.40	0.49	0	1
Emp.: Upper prime (40-49)	28153	0.26	0.44	0	1
Emp.: Up to retirement (50-65)	28153	0.22	0.42	0	1
Emp.: Separated/divorced/widowed	28095	0.09	0.28	0	1
Emp.: Single	28095	0.22	0.41	0	1
Emp.: Married	28095	0.69	0.46	0	1
Emp.: No dependent children	27598	0.59	0.49	0	1
Emp.: Has children age 0-4	27598	0.14	0.34	0	1
Emp.: Has children age 5-11	27598	0.19	0.39	0	1
Emp.: Has children age 12-18	27598	0.20	0.40	0	1
Emp.: Ethnic background other than white	28048	0.04	0.20	0	1
Emp.: Degree or higher	27979	0.25	0.44	0	1
Emp.: A-level	27979	0.16	0.37	0	1
Emp.: Less than A-level	27979	0.37	0.48	0	1
Emp.: No qualifications	27979	0.22	0.41	0	1
Emp.: Has vocational qualifications	27734	0.38	0.48	0	1
Emp.: Professional	27518	0.17	0.38	0	1
Emp.: Managerial	27518	0.11	0.31	0	1
Emp.: Associated professional	27518	0.10	0.30	0	1

Appendix C.4 Ctn.

Employee, job and workplace characteristics	Obs.	Mean	St. Dev.	Min	Max
Emp.: Skilled non-manual	27518	0.21	0.40	0	1
Emp.: Skilled manual	27518	0.15	0.36	0	1
Emp.: Partly skilled	27518	0.16	0.37	0	1
Emp.: Unskilled	27518	0.10	0.30	0	1
Emp.: Professional & Associated/Managerial	27518	0.38	0.49	0	1
Emp.: Non-professional occupation	27518	0.62	0.49	0	1
Emp.: I am a union member	28095	0.41	0.49	0	1
Emp.: Tenure: under 1 year	28122	0.16	0.37	0	1
Emp.: Tenure: 1 to 2 years	28122	0.12	0.33	0	1
Emp.: Tenure: 2 to 5 years	28122	0.23	0.42	0	1
Emp.: Tenure: 5 to 10 years	28122	0.22	0.41	0	1
Emp.: Tenure: over 10 years	28122	0.26	0.44	0	1
Emp.: Has an illness or a disability	28031	0.05	0.23	0	1
Emp.: Permanent contract	28021	0.93	0.26	0	1
Emp.: Temporary contract	28021	0.04	0.19	0	1
Emp.: Fixed-term contract	28021	0.03	0.18	0	1
Emp.: Part-time job	24534	0.23	0.42	0	1
Mgr.: Workplace size: over 1000	28125	0.05	0.22	0	1
Mgr.: Workplace size 500-999	28125	0.09	0.28	0	1
Mgr.: Workplace size 100-499	28125	0.40	0.49	0	1
Mgr.: Workplace size 50-99	28125	0.19	0.40	0	1
Mgr.: Workplace size 25-49	28125	0.19	0.39	0	1
Mgr.: Workplace size 20-24	28125	0.03	0.18	0	1
Mgr.: Workplace size 10-19	28125	0.05	0.21	0	1
Mgr.: Workplace size 20-49	28125	0.22	0.42	0	1
Mgr.: Workplace size: over 500	28125	0.14	0.34	0	1
Mgr.: Public sector	28215	0.35	0.48	0	1
Mgr.: Private sector	28215	0.65	0.48	0	1
Mgr.: Sector: Production (Manufacturing, or Electricity, gas, water, or Construction)	28215	0.23	0.42	0	1
Mgr.: Sector: Hotels and restaurants & Transport and communication	28215	0.10	0.30	0	1
Mgr.: Sector: Wholesale and retail	28215	0.13	0.33	0	1
Mgr.: Sector: Financial services	28215	0.06	0.23	0	1
Mgr.: Sector: Other business services	28215	0.09	0.29	0	1
Mgr.: Sector: Public administration	28215	0.10	0.30	0	1
Mgr.: Sector: Education	28215	0.12	0.33	0	1
Mgr.: Sector: Health	28215	0.12	0.33	0	1
Mgr.: Sector: Other community services	28215	0.05	0.21	0	1
Mgr.: Sector: Financial/Other business services	28215	0.15	0.35	0	1
Mgr.: In production sector	28197	0.20	0.40	0	1
Mgr.: Market is declining	28215	0.07	0.25	0	1
Mgr.: Market is turbulent	28215	0.12	0.33	0	1

Appendix D

Appendix D.1

Selected studies on training and its economic consequences, listed by country

Country	Selected studies
UK	Booth 1991, Bartel 1995, Arulampalam and Booth 1997, Green and Zanchi 1997, Green 1997, Black and Lynch 1998, Shields 1998, Green 1999, Whitfield 2000, Booth and Bryan 2002, Battu <i>et al</i> 2003, Booth <i>et al</i> 2003, Grugulis 2003, Hoque 2003, Martin 2003, Sutherland 2004, Vignoles <i>et al</i> 2004, Almeida-Santos and Mumford 2005, Collier <i>et al</i> 2005, Almeida-Santos and Mumford 2006, Dearden <i>et al</i> 2006, Gospel and Foreman 2006. The most recent findings cited here (Dearden <i>et al</i> 2006), coming from several datasets (LFS, Annual Census of Production) show that a 1% point increase in training increases hourly wages by about 0.3 %.
Canada	Cameron <i>et al</i> 2005
Germany	Pischke 2001, Zwick 2004
Israel	Harel and Tzafir 1999
Italy	Conti 2005
Japan	Owan 2004, Kawaguchi 2006
Thailand	Ariga and Brunello 2006
USA	Acemoglu and Pischke 1998, Frazis <i>et al</i> 1998, Burke and Baldwin 1999, Pergamit and Veum 1999, Autor <i>et al</i> 2002, Ichniowski and Show 2002, Paulson Gjerde 2002, Ichniowski <i>et al</i> 2003, Owan 2004

Appendix D.2

Selected studies on promotion, listed by country

Country	Selected studies
UK	Francesconi 2001, Booth <i>et al</i> 2003, Eguchi 2004, Melero 2004
Finland	Pekkarinen and Vartiainen 2006
Japan	Owan 2004
Spain	Bayo-Moriones and Ortin-Angel (2006)
USA	Hersch and Viscusi 1996, Landers <i>et al</i> 1996, Pergamit and Veum 1999, Paulson Gjerde 2002, Owan 2004

Appendix D.3

Distribution of panel data observations (spells of employment) by year

Year	Frequency	Percent	Cumulative frequency
1991	4,862	8.07	8.07
1992	4,519	7.50	15.57
1993	4,303	7.14	22.71
1994	4,347	7.21	29.93
1995	4,315	7.16	37.09
1996	4,514	7.49	44.58
1997	4,635	7.69	52.27
1998	5,151	8.55	60.82
1999	5,025	8.34	69.16
2000	5,006	8.31	77.47
2001	4,962	8.24	85.70
2002	4,344	7.21	92.91
2003	4,270	7.09	100.00
Total	60,253	100.00	

Appendix D.4

Distribution of panel data observations by gender, sector and occupation

Sample total: 60,253				
	Men		Women	
	Absolute	Percentage	Absolute	Percentage
In sample	29,638	49.19	30,615	50.81
By gender, in private sector	23,406	55.89 Of total men: 78.97	18,476	44.11 Of total women: 60.35
By gender, in professional occupations	11,387	53.64 Of total men: 38.42	9,840	46.36 Of total women: 32.14

Appendix D.5. Variable definitions and means

Variable Label	All						Men						Women						
	With training			With promotion			With training			With promotion			With training			With promotion			
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	
PERSONAL, JOB AND WORKPLACE CHARACTERISTICS																			
Age	37.95	11.65	36.85	11.02	34.03	9.73	37.65	11.73	36.36	11.03	34.18	9.67	38.25	11.56	36.85	11.02	33.86	11.02	9.80
Age squared/100	15.76	9.22	14.79	8.49	12.53	7.23	15.55	9.29	14.44	8.47	12.62	7.26	15.97	9.15	14.79	8.49	12.42	8.49	7.19
Gender: Male (base)	0.49	0.50	0.49	0.50	0.54	0.50	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00	0.49	0.50	0.00	0.50	0.00
Gender: Female	0.51	0.50	0.51	0.50	0.46	0.50	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.51	0.50	1.00	0.50	0.00
Married (base)	0.58	0.49	0.57	0.49	0.53	0.50	0.58	0.49	0.59	0.49	0.58	0.49	0.58	0.49	0.57	0.49	0.48	0.49	0.50
Not married	0.42	0.49	0.43	0.49	0.47	0.50	0.42	0.49	0.41	0.49	0.42	0.49	0.42	0.49	0.43	0.49	0.52	0.49	0.50
Education: Higher degree	0.03	0.16	0.03	0.18	0.04	0.20	0.03	0.18	0.04	0.19	0.05	0.21	0.02	0.15	0.03	0.18	0.03	0.18	0.18
Education: First degree	0.12	0.33	0.17	0.38	0.20	0.40	0.13	0.33	0.18	0.38	0.20	0.40	0.12	0.32	0.17	0.38	0.19	0.38	0.39
Education: Other higher qualification	0.27	0.45	0.37	0.48	0.32	0.47	0.29	0.46	0.37	0.48	0.33	0.47	0.26	0.44	0.37	0.48	0.31	0.48	0.46
Education: GCE A level	0.13	0.33	0.13	0.33	0.15	0.35	0.14	0.34	0.14	0.35	0.14	0.35	0.12	0.32	0.13	0.33	0.15	0.33	0.36
Education: O level (base)	0.21	0.41	0.18	0.38	0.18	0.38	0.19	0.39	0.16	0.36	0.16	0.37	0.24	0.43	0.18	0.38	0.20	0.38	0.40
Education: Less than O level or other	0.22	0.42	0.11	0.31	0.10	0.30	0.21	0.41	0.10	0.30	0.10	0.30	0.24	0.43	0.11	0.31	0.11	0.31	0.31
Company size: under 25 (base)	0.34	0.47	0.28	0.45	0.23	0.42	0.29	0.46	0.24	0.43	0.19	0.39	0.38	0.49	0.28	0.45	0.28	0.45	0.45
Company size: 25-99	0.26	0.44	0.27	0.44	0.25	0.43	0.26	0.44	0.26	0.44	0.25	0.43	0.26	0.44	0.27	0.44	0.25	0.44	0.44
Company size: 100-499	0.23	0.42	0.24	0.43	0.28	0.45	0.27	0.44	0.28	0.45	0.32	0.47	0.20	0.40	0.24	0.43	0.24	0.43	0.43
Company size: over 500	0.17	0.37	0.21	0.41	0.23	0.42	0.18	0.38	0.22	0.42	0.24	0.43	0.15	0.36	0.21	0.41	0.22	0.41	0.42
Union member	0.28	0.45	0.36	0.48	0.29	0.45	0.30	0.46	0.35	0.48	0.27	0.45	0.26	0.44	0.36	0.48	0.31	0.48	0.46
Full-time job (base)	0.80	0.40	0.86	0.34	0.95	0.22	0.96	0.19	0.97	0.17	0.98	0.13	0.65	0.48	0.86	0.34	0.91	0.34	0.28
Part-time job	0.20	0.40	0.14	0.34	0.05	0.22	0.04	0.19	0.03	0.17	0.02	0.13	0.35	0.48	0.14	0.34	0.09	0.34	0.28

Appendix D.5. Variable definitions and means (Continued)

Variable Label	All						Men						Women					
	With training			With promotion			With training			With promotion			With training			With promotion		
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.		
Permanent contract (base)	0.94	0.24	0.95	0.21	0.98	0.14	0.95	0.22	0.96	0.19	0.99	0.12	0.93	0.26	0.95	0.21	0.98	0.16
Temporary contract	0.03	0.18	0.02	0.13	0.00	0.07	0.02	0.15	0.01	0.11	0.00	0.05	0.04	0.20	0.02	0.13	0.01	0.08
Fixed-term contract	0.03	0.17	0.03	0.17	0.01	0.12	0.03	0.16	0.02	0.15	0.01	0.10	0.03	0.17	0.03	0.17	0.02	0.13
No. of hours normally worked per week	34.04	11.48	35.19	10.35	37.48	8.45	38.78	9.14	38.73	8.94	39.22	8.32	29.44	11.64	35.19	10.35	35.44	8.14
No. of overtime hours in normal week	4.05	6.45	4.67	6.77	6.00	7.24	5.39	7.28	5.63	7.33	6.93	7.79	2.76	5.21	4.67	6.77	4.91	6.37
Tenure	208.3	161.8	199.4	154.5	176.4	141.5	211.7	164.2	196.6	153.8	179.5	144.5	205.0	159.5	199.4	154.5	172.7	137.9
Tenure squared (,000)	69.6	92.7	63.6	86.2	51.1	72.1	71.7	94.9	62.2	85.8	53.0	74.7	67.4	90.4	63.6	86.2	48.8	68.6
TRAINING, PROMOTION AND WAGE VARIABLES (dependent variables in italics)																		
Training dummy	0.35	0.48	1.00	0.00	0.54	0.50	0.35	0.48	1.00	0.00	0.52	0.50	0.36	0.48	1.00	0.00	0.57	0.50
Total Trained t-1	1.52	2.03	2.10	2.30	2.08	2.22	1.55	2.03	2.07	2.28	2.06	2.22	1.48	2.03	2.10	2.30	2.10	2.21
<i>Training with same employer in spell t-1</i>	0.31	0.46	0.88	0.33	0.52	0.50	0.31	0.46	0.88	0.33	0.50	0.50	0.31	0.46	0.88	0.33	0.53	0.50
<i>Training with same employer in spell t</i>	0.26	0.44	0.44	0.50	0.40	0.49	0.26	0.44	0.43	0.50	0.39	0.49	0.26	0.44	0.44	0.50	0.41	0.49
<i>Training with same employer in spell t-1</i>	0.22	0.42	0.33	0.47	0.34	0.47	0.22	0.42	0.33	0.47	0.33	0.47	0.22	0.42	0.33	0.47	0.34	0.48
<i>Training with previous employer in spell t</i>	0.04	0.20	0.12	0.33	0.03	0.16	0.04	0.20	0.12	0.33	0.02	0.14	0.04	0.20	0.12	0.33	0.03	0.18

Appendix D.5. Variable definitions and means (Continued)

Variable Label	All						Men						Women						
	With training			With promotion			With training			With promotion			With training			With promotion			
	Mean	Std. Dev.	Std. Dev.	Mean	Std. Dev.	Std. Dev.	Mean	Std. Dev.	Std. Dev.	Mean	Std. Dev.	Std. Dev.	Mean	Std. Dev.	Std. Dev.	Mean	Std. Dev.	Std. Dev.	
Training with previous employer in spell t-1	0.03	0.18	0.23	0.06	0.23	0.22	0.03	0.18	0.22	0.04	0.20	0.03	0.18	0.23	0.06	0.03	0.18	0.23	0.24
Training with previous employer in spell t-2	0.03	0.17	0.20	0.04	0.20	0.19	0.03	0.17	0.19	0.04	0.19	0.03	0.17	0.20	0.04	0.03	0.17	0.20	0.20
Promotion dummy	0.06	0.25	0.30	0.10	0.30	1.00	0.07	0.26	0.31	1.00	0.00	0.06	0.23	0.30	0.10	0.06	0.23	0.30	0.00
Total Promoted t-1 with same employer in spell t	0.27	0.67	0.73	0.33	0.73	0.58	0.30	0.72	0.77	0.63	0.99	0.24	0.61	0.73	0.33	0.24	0.61	0.73	0.84
Promotion with same employer in spell t-1	0.06	0.24	0.29	0.09	0.29	0.95	0.07	0.25	0.30	0.96	0.20	0.05	0.23	0.29	0.09	0.05	0.23	0.29	0.25
Promotion with same employer in spell t-2	0.00	0.06	0.07	0.00	0.07	0.05	0.00	0.05	0.06	0.04	0.20	0.00	0.06	0.07	0.00	0.00	0.06	0.07	0.25
Promotion with previous employer in spell t	0.05	0.22	0.26	0.07	0.26	0.37	0.06	0.23	0.27	0.18	0.39	0.05	0.21	0.26	0.07	0.05	0.21	0.26	0.36
Promotion with previous employer in spell t-1	0.04	0.20	0.23	0.06	0.23	0.10	0.05	0.21	0.24	0.11	0.31	0.04	0.19	0.23	0.06	0.04	0.19	0.23	0.28
Promotion with previous employer in spell t	0.00	0.05	0.07	0.00	0.07	0.01	0.00	0.05	0.05	0.01	0.08	0.00	0.06	0.07	0.00	0.00	0.06	0.07	0.11
Promotion with previous employer in spell t-1	0.00	0.05	0.06	0.00	0.06	0.00	0.00	0.05	0.05	0.00	0.06	0.00	0.05	0.06	0.00	0.00	0.05	0.06	0.08
Promotion with previous employer in spell t-2	5.41	0.77	0.67	5.59	0.67	5.78	5.74	0.57	0.55	5.95	0.50	5.08	0.79	0.67	5.59	5.08	0.79	0.67	0.56
Log. of wage																			

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