Leeway for the loyal: a model of employee discretion.

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ABSTRACT

This paper examines the factors underlying task discretion from an economist's perspective. It argues that the key axis for understanding discretion is the trade-off between the positive effects of discretion on potential output per employee and the negative effects of greater leeway on work effort. In empirical analysis using matched employer-employee data it is shown that discretion is strongly affected by the level of employee commitment. In addition discretion is generally greater in high-skilled jobs, though not without exceptions, and lower where employees are under-skilled. Homeworking and flexitime policies raise employee discretion. The impact of teamworking is mixed. In about half of cases team members do not jointly decide about work matters, and the net effect of teams on task discretion in these cases is negative. In other cases, where team members do decide matters jointly, the impact is found to be neutral according to employees' perceptions, or positive according to managers' perceptions. There are also significant and substantial unobserved establishment-level factors which affect task discretion.

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1. Introduction.

This paper examines the design of jobs from an economic perspective, with a focus on employees' autonomy. While worker autonomy has been central both to sociology's class-based analyses of work (Braverman, 1974), and to psychology's demand-control model of job satisfaction and stress (Karasek, 1979), neoclassical economics traditionally placed no emphasis on the subject. Economics preferred to leave issues of job design and work organisation to the "black box" of technical processes taking place inside the workplace. Yet in recent decades the extent to which employees are free to decide matters concerning their job tasks has come to be seen as important in several strands of modern economic theory, which sees the worker-boss relationship as an example of a principal-agent problem. The location of influence over production decisions is an issue for the design of optimal incentive structures (e.g. Athey and Roberts, 2001) or for the distribution of power (e.g. Guy and Skott, 2005), depending on one's perspective; it is an implicit or explicit ingredient in efficiency-wage models. Workplace autonomy is also a highly valued job feature in itself, being a major factor underpinning workers' intrinsic job satisfaction as proposed both in an earlier literature on job design (e.g. Davis, 1966; Cooper 1973) and in more recent studies of job satisfaction (Harley, 2001; Green and Tstitsianis, 2005). There is, moreover, indirect evidence of a high demand for autonomy, in observed studies of the demand for self-employment status. Although the latter is constrained by credit and cost restrictions, the desire for autonomy is frequently given as a major reason for wanting self-employment (Taylor, 1996; Clinton et al., 2006).

The particular aspect of autonomy upon which this paper concentrates is the level of personal influence or discretion over the tasks that employees do in their own jobs, referred to as "task discretion". This aspect is distinct from any influence that might be afforded to the teams in which employees might work, and from broader forms of participation in organisation-wide decision making, whether through works councils, trade unions or other communication channels.

The need for an understanding of task discretion is heightened by the discovery that its average level fell considerably in Britain throughout the 1990s (and was probably declining since at least the mid 1980s). By contrast, participation in decision-making at

establishment level, which is affected by different factors and is arguably less important than task discretion for employee well-being, appears to have grown somewhat more widespread among British establishments over this period (Felstead et al, 2002: 67-8; Gallie et al, 2004; Millward et al., 2000). The 1990s fall in task discretion in Britain hardly conforms to the paradigm of Post-Fordism and has yet to be adequately explained. The fall contrasts with modest rises in task autonomy in Finland and in Norway during both the 1980s and 1990s (Lehto and Sutela, 1999, 2005; Leiulfsrud and Dahl, 2005), while in Sweden there were increases from at least 1975 until the 1990s, at the end of which some declines of decision latitude are reported (Theorell, 2004; Vogel and Theorell, 2006). While comparisons of autonomy levels between nations are subject to possible biases, in 2006 workers in the UK are reported to have an average amount of autonomy, according to the European Working Conditions Survey, while all the Scandinavian countries rank much more highly (European Foundation for the Improvement of Living and Working Conditions, 2007).

Task discretion is only implicitly incorporated within economists' empirical investigations of efficiency wage models, which have focused on the behavioural implications of the principal-agent nexus for productivity, wages, or work effort. Authors in this tradition have only rarely attempted to weave direct measures of workplace autonomy into their tests of model predictions. Bryson and Freeman (2007) is a rare exception, in which it is found that the impact on productivity of certain combinations of "fair share capitalism" is somewhat larger in workplaces that devolve greater autonomy in decision-making to their employees. Empirical research on job design, and attendant studies of autonomy in jobs, have largely been carried out on small scale samples or in single case studies, by occupational psychologists with rather different objectives to those of economists. Consequently relatively little is known about the characteristics of firms, jobs and workers that are associated with high or low levels of autonomy – factors which might be thought relevant to a better understanding of the formation of labour contracts. Moreover, the determination of autonomy has only rarely been considered in the context of a profit-maximising model of the firm.

What, then, determines the amount of autonomy afforded to workers? The answer, I propose in this paper, is derived from post-Fordism, and is linked to the related issue of workers' commitment to the organisation. I use the term 'post-Fordism' here as a short-hand for the proposition that, in contrast to the technologies and power structures of

earlier generations, prevailing modern technologies are such that relatively dense local decision-making (by workers themselves, individually or in teams) is efficient up to a point: it therefore profits employers to allow employees some leeway in their jobs. But employers also face the fundamental post-Fordist dilemma that leeway permits self-interested employees to take advantage and work less hard.[1] Autonomy can be more effectively granted, therefore, to those workers that are less likely to behave opportunistically – that is, those whose preferences are to identify with the company's objectives, share its values, and to show loyalty. Leeway is thus for the loyal, not for a purely self-interested *homo economicus*. The centrality of a key role for affective commitment is this paper's core hypothesis.

Recent large-scale empirical studies of worker autonomy have examined the roles of collective bargaining, skill, technology, work organisation and sector. Harley (2001) found, contrary to the expectations of high-performance management theorists, that team production techniques had little or no effect on personal discretion. Batt (2004) reports US evidence that self-managed teams enhance discretion somewhat for workers, but decreases it for supervisors. Gallie et al (2004) also report a mixed impact of teamworking, but they also found that neither technological/organisational nor compositional changes in Britain's labour market account for observed movements in task discretion. They speculate that the decline may have been linked to a growing culture of management by target-setting, and closer monitoring of work as a response to greater international competition or to an increasingly controlling regulatory framework. None of these studies have attempted to bring out a key role for commitment in determining job design.

This paper proposes several advances in our understanding of task discretion. As a preliminary, the determination of discretion is first set in a simplified theoretical framework designed to bring out the role of affective commitment alongside skill. To set the empirical scene, it sheds some preliminary light on whether the 1990s decline in British workers' task discretion has continued in the present decade. I then make use of matched employer-employee data to investigate the multiple determinants of task discretion. The richness of the data permits an analysis of the impact of several forms of work organisation including teamworking, home working and other forms of flexible work practices, as well as an investigation of the effect of management by target-setting and a focus on the role of worker's commitment and skill. The paper also explores for

the first time the effect of skill mismatch on discretion, in particular the impact on discretion of workers being under-skilled for their job. Finally, it examines the extent to which unknown establishment-specific effects are having an effect on job design. The significance of this investigation is that any establishment-fixed effects on job design are interpretable as potentially originating from the particular management culture of the organisation.

The paper proceeds as follows. Section 2 sets out a simple model of the determination of task discretion which highlights the role of worker commitment, and derives a number of hypotheses for empirical testing. The model implies that discretion is increased when workers have greater commitment, but that the relationship with job-skill level is ambiguous and the link with skills mis-match is asymmetric. Section 3 describes the data, and Section 4 follows with the reported findings.

2. The determination of discretion: theory and model specification.

The level of autonomy afforded to workers in their jobs can be viewed as a decision about job design. The aim of this section is to describe a simplified model of the determination of task discretion (representing autonomy) for a job, which will provide the framework for the empirical investigation of hypotheses in Section 4. The essence of the model is in part a trade-off between effort and efficiency. This part of the theory is in the spirit of economic models in which the allocation of decision rights is endogenously determined by the trade-off between the value (to principals) derived from delegating authority and associated incentives to agents (in this case, employees) and the costs of ceding control to agents whose interests differ from those of principals (Aghion and Tirole, 1997; Dessein, 2002; Athey and Roberts, 2001). In this paper, however, I am not concerned with the resulting interactions between incentives structures and delegation. Quite simply, the decision about discretion is assumed to be affected both by the extent to which discretion raises (or lowers) productivity and by the impact of discretion on worker effort, which in turn depends on workers' commitment to the organisation.

In practice potential discretion ranges over many domains in any one job. Employees might be able to decide the order of tasks, for example, without having any say over which tasks are to be done. Some tasks may be left to employees' decisions, while

others are closely controlled by managers. At any one time discretion can be conceived as the proportion of feasible tasks among which the employee can decide on a course of action. The average taken over a sufficient period constitutes the level of discretion in the job. I postpone till the next section how this concept of discretion can be operationalised and captured with survey items.

We can express the value of output per employee, q, as:

$$q = f(x; s, \sigma) g(x; c) \qquad (1)$$

where *f()* is the productivity of effective labour, and *g()* is the amount of effective labour per employee (work effort); x is the level of employee discretion, $\sigma = h - s$ is the difference between the own skill level (h) and the job-skill level (s), and c is the level of affective organisational commitment (to be discussed below). Discretion may raise productivity up to a point, but it may also diminish work effort – a standard principal-agent issue. It is this form of the production function which generates the fundamental post-Fordist trade-off in job design. Whereas, in traditional neoclassical theory, it used to be assumed that the employer would choose to design jobs with zero discretion, modern theory recognises that there are productive advantages to granting employees freedom to make hard-to-anticipate daily decisions, or more broadly to exercise creative powers on behalf of the employer. Some local task discretion is productive because it makes better use of employee's knowledge and information that is frequently changing than is possible for distant managers. This assumption reflects the idea of post-Taylorism in labour process theory, and captures a substantial literature concerning functional flexibility in modern organisations. Up to a point the marginal productivity of increased discretion is assumed positive, though there will be diminishing returns as workers are constrained by the limits of their own knowledge and skill.

More skilled jobs are more productive. Moreover, because decision-making and creativity require the employee to have knowledge of existing production processes and future possibilities, I expect high-skilled jobs, as long as they are matched by higher-skilled workers, to benefit more than low-skilled jobs would from discretion.[2] Complex production processes (giving more skilled jobs) are more likely to benefit from dense optimal decision-making than simpler processes that can be coded in informal, bureaucratic or software routines. The lowest amount of discretion is needed for low-

skilled routine jobs, where decision-making is thin. Where, by contrast, there are many non-routine functions required, as can happen in some service jobs that are nevertheless classified as low-skilled, there remains a productive value to allowing such workers a measure of discretion. The post-Fordist thesis stated in this and the previous paragraph is embodied in the assumptions $f_x > 0, f_{xx} < 0, f_s > 0, f_{xs} > 0$.

The match between the workers' skills and the jobs they do is also important. With frictions in the labour market, including hiring costs, workers can and often do persist in jobs where they have too many or too few skills needed to do the job well. For any given level of job skills a rise in own skills raises productivity when workers are under-skilled but has little or no impact when workers are over-skilled. In addition the marginal productivity of discretion is expected to be lower the more that employees are under-skilled for the job, because the benefits of local decision-making are reduced if some wrong decisions are made. On the other hand, if employees are over-skilled for the job, one would not expect the marginal productivity of discretion to be affected by further increments to the employee's skill. Thus:

$$f_\sigma > 0 \text{ and } f_{\sigma x} > 0 \text{ for } \sigma < 0,\ f_\sigma = f_{\sigma x} = 0 \text{ for } \sigma \geq 0.$$

Personal skill, however, is not the only factor constraining the level of afforded discretion. The latter depends, also, on the fact that increased discretion gives more scope for opportunistic behaviour, and so may lower work effort, other things equal. The constraint on opportunistic behaviour is the threat of some penalty for those caught taking advantage of this scope. I abstract from considering variations in monitoring costs or in wages, either of which can play the central role in determining discretion in standard models. Instead, despite its impact on effort non-zero discretion is chosen because of its direct positive impact on productivity. Formally, I assume $g_x < 0$.

However, the potential losses from opportunistic behaviour depend on workers' preferences – in this case, their disutility from effort on behalf of their employer. Whereas economic theory typically takes workers' preferences as given, here I draw on psychological literature for a measurable construct, i.e. "organisational commitment". A substantial literature from psychology and from human resource management analysts shows that employees are to different degrees committed to their work organisation. A distinction is made between forms of commitment, the most prominent categorisation being between "affective", "continuance" and "normative" commitment.

A good part of the research programme of psychologists working in this area has been trying to understand how the different states of mind and preferences represented by these constructs relate to each other, and to other psychological constructs. The constructs are also expected to be related to behaviours such as turnover and effort, and these have been confirmed in many studies (Mathieu and Zajac, 1990; Meyer et al, 2002). Of most relevance here is the idea of affective commitment, associated with the work of Mowday et al (1979, 1982). From the economists' perspective, affective organisational commitment can be thought of as a proxy for the utility attached to working for the current employing organisation, compared to a similar job working for the next best available organisation. The worker experiences firm-specific utility from belonging to (being employed by) the organisation, in so far as he/she shares the values of, and identifies with, the organisation. Those with a greater affective commitment to their organisation want to work harder, or are less averse to work effort, on behalf of the organisation.[3] Moreover, increased affective organisational commitment is expected to raise the marginal impact of discretion on work effort (that is, to lower the negative impact of discretion). Thus I assume $g_c > 0, g_{xc} > 0$.

Assuming a firm designs jobs with discretion levels to maximise output per employee the first-order condition for an interior solution implies:

$$gf_x + fg_x = 0 \qquad (2)$$

Thus the optimal work design is set where the marginal productivity of an increase in discretion (the first term in the equation) is set equal to the marginal loss from lower effort (the negative of the second term). This is the fundamental post-Taylorist trade-off in job design that I referred to above. It is a simple matter of comparative statics to show how employers would aim to set different levels of discretion according to varying levels of commitment, skill and skill match:

$$\frac{\partial x}{\partial c} = \frac{-1}{\Delta}\left(fg_{xc} + g_c f_x\right) \qquad (3)$$

$$\frac{\partial x}{\partial s} = \frac{-1}{\Delta}\left(gf_{xs} + f_s g_x\right) \qquad (4)$$

$$\frac{\partial x}{\partial \sigma} = \frac{-1}{\Delta}\left(gf_{x\sigma} + f_\sigma g_x\right) \qquad (5)$$

where $\Delta = gf_{xx} + fg_{xx} + 2f_x g_x < 0$ by the 2nd-order condition that output per employee is being maximised.

Equation (3) shows that the level of discretion is unambiguously expected to increase in the level of commitment, because the theoretical assumptions ensure that both terms on the right hand side are positive. An employer whose workforce is more committed and loyal will choose to grant greater autonomy to them, allowing them greater discretion to choose which tasks to do, how and when to do them, how well to do each of them and how hard to work at them.

Equation (4) indicates that the effect of job-skill level on discretion is, however, ambiguous. A rise in job-skill level increases the marginal impact of discretion on output (the first term in (4) is positive); while the (negative) second term shows that in a high-skilled job there is more value at stake from opportunistic behaviour. If the first term prevails, we expect to see discretion associated with high-skilled jobs, which is the conventional presumption in sociological accounts of discretion in its relation to social class. The second term shows the possibility that there may be some highly skilled jobs, however, which managers choose to monitor closely and allow little discretion. The cost to the employer of self-interested employee behaviour is raised if the job-skill is raised.[4, 5].

The effect on discretion of a rise in own skill level is predicted to be zero, when skill is above the matched level for the job, according to equation (5). When own skill is below the matched level, the impact of own skill is ambiguous. In that circumstance the first term in (5) is positive, reflecting the fact that more skill raises the marginal productivity of discretion, and hence the demand for discretion. The second term is negative, however, reflecting again the fact that the stakes are raised when skill is increased.

Thus the discretion function can be written:

$$x = x(c, s, \sigma, \mathrm{M}) \qquad (6)$$

with $x_c > 0$, x_s ambiguous and x_σ either zero if σ is non-negative or ambiguous otherwise; M is included in order to represent the different production functions that prevail in each establishment. M can be seen as capturing either different technologies that require varying levels of local decision-making, or more generally establishment-specific management policies. Some of the latter will be observable practices and

policies, while others may by unobserved cultures that entail certain beliefs about the productiveness of discretion. M thus allows for the possibility that there will be establishment-wide attitudes to job design that are not related to job or personal characteristics.

Assuming a linear specification we may write the following equation to be estimated:

$$x_{ij} = \alpha c_{ij} + \beta s_{ij} + \chi \sigma_{ij} + \phi X_i + \theta Z_j + \mu_j + \varepsilon_{ij} \qquad (6')$$

Subscripts *ij* refer to employee *i* in establishment *j*; X_i is a vector of controls for personal and job characteristics; Z_j are controls for observed establishment policies and practices; μ_j captures the unobserved establishment-fixed effects, and ε_{ij} random error.

Equation (6′) is a structural equation determining the level of discretion, and it might be thought of as part of a wider model of determination within an organisation, that encompasses job design, other elements of work organisation, skill, wages and broader strategies and technology. In principle, the way to analyse firm behaviour should be through a multi-variable model that treats firm behaviour in a system context, in which all but a few variables are seen as endogenous outcomes of the managerial system. Yet no empirical studies of work organisation have been couched in such a systemic way, owing to the twin problems of scarce data and the difficulties of identifying structural relationships from observed behaviour. The typical approach is to specify single-equation relationships in linear or easy-to-estimate forms, and treat all RHS variables as exogenous; or else to limit the aim to capturing conditional correlations which may or may not be indicative of causation. Studies of discretion are also like this (Harley, 2001; Gallie et al, 2004). Arguably single-equation OLS studies do pick up much that is sensible about real-world relationships. Yet unobserved heterogeneity is a ubiquitous issue throughout quantitative industrial relations research. In this case, a potential problem arises in that a key RHS variable, commitment, is a measure of self-reported preferences, while the dependent variable is a self-reported measure of work design. If both self-reports are affected by unobserved personality traits, which could increase the likelihood of more positive responses to both commitment and discretion, the estimate of β will be upward biased. The risk of bias is compounded by the possibility that reverse causation is also present. Designing jobs with high levels of discretion may be one way of generating affective organisational commitment (Lincoln and Kalleberg,

1990), since worker autonomy is a major determinant of job satisfaction. A more satisfied worker is more likely to develop preferences favourable to the organisation, and indeed several studies report correlations between job satisfaction and organisational commitment (Cohen and Gattiker, 1994). It will therefore be necessary to account for potential biases in the estimates of α, through the use of suitable instruments to be discussed in the next section.

The assumptions of the model imply the following hypotheses:

$$H1: \hat{\alpha} > 0; H2: \hat{\beta}\ ambiguous; H3: \hat{\chi}\ ambiguous\ for\ \sigma \le 0, \hat{\chi} = 0\ otherwise$$

These hypotheses can be tested using a variety of assumptions about the covariance of the error structures. In addition, I shall also consider in Section 5 whether certain management policies or technological/organisational characteristics captured in Z_j or job characteristics captured in X_i, have the expected association with task discretion – these include teamworking, homeworking, Just-In-Time production systems, flexible work practices, forms of work monitoring, and trade union membership.

3. Data.

To investigate these issues I make use of a recent matched establishment-employee data set, the *Workplace Employment Relations Survey, 2004* (WERS 2004), which is a nationally representative, multi-part, survey of people at work. WERS2004 represents a continuation of earlier surveys of British industrial relations, though only the 1998 and 2004 surveys have contained surveys of matched employees. The survey series provides a mapping of employment relations practices across establishments and time. The management survey in WERS2004 gives measures of workplace characteristics, as well as rich details of human resource practices, and representation and communication mechanisms. In 2004, the sample was drawn from establishments with 5 or more workers. A stratified sampling strategy was pursued, in order to obtain sufficient cases of establishments with many employees. Accordingly analyses are normally weighted by the sampling weights provided (which also take account of non-response biases) in order to obtain unbiased estimates of the target population across Britain. The true response rate among eligible establishments was 64%.

For the survey of employees, questionnaires were distributed by management to up to 25 potential respondents in each establishment. In the case of establishments with between 5 and 25 employees, all employees received a questionnaire; for larger establishments, employees were chosen using a random selection process. In about 14% of establishments where a manager was interviewed, no employee questionnaires were returned, largely because the forms failed to be distributed. Among those where at least one questionnaire was returned, the employee response rate was 61%. The non-response, together with the survey-design selection probabilities, was used to generate appropriate weights for use in analyses. Details of the differential non-response rates can be found in the Technical Report along with the data at the UK Data Archive (Department of Trade and Industry. Employment Markets Analysis and Research et al., 2005). In what follows, it is implicitly assumed that any unobserved factors affecting response propensities are not correlated with the variables of interest in the analyses. Use is also made of the equivalent employee survey in WERS98 to examine the most recent trends in discretion and commitment. In what follows, the analysis is confined to the private sector.[6]

4. Findings.

a) Measuring Task Discretion and Organisational Commitment.

The measure of task discretion was derived from responses to five questions that began with the common stem: "In general, how much influence do you have over the following?". The questions then referred to what tasks were done, the pace of work, how the work was done, the order in which tasks were done, and the timing of the start and finish of the working day. Against each of these domains of control, respondents replied on a 4-point scale.

Their responses are shown in Table 1. It can be seen that a substantial majority of respondents perceived that they had at least some influence in four of the domains; but that only a half of respondents felt that they had at least "some" control of when they started and finished work. A third were completely constrained in the latter regard, experiencing no control at all.

For the subsequent analysis I computed a single measure capturing the overall level of task discretion in the job. Assigning cardinal values 1-4 respectively to the responses "none" to "a lot", an additive scale is obtained, entitled the Task Discretion Index (TDI), by averaging the values of all five variables, yielding a range 1 to 4 and a mean of 3.002. Cronbach's alpha statistic measuring scale reliability for this measure is 0.815, which implies a good level of reliability. Alternative indices can also be used, in order to test the robustness of the findings. One alternative is to generate scores from a factor analysis. The principal factor method was used, and this extracted only one factor. In another alternative, the fifth domain was excluded from the scale (for both the additive scale and the factor score), since its correlation with the other domains was the lowest. In what follows, a broadly similar pattern of findings emerges from using any of these alternatives, so only the findings from the additive scale are presented.

Complementing employees' estimates of their own task discretion, managers' were also asked three questions about the individual task discretion involved in the jobs of employees. Managers were asked "to what extent would you say that individuals (in the largest non-managerial occupational group in the establishment) have discretion over how they do their work". Subsequent questions asked about having "control over the pace at which they do their work" and "involvement in decisions over how their work is organised". Respondents could answer "a lot", "some", "little" or "none". The responses to these questions were averaged to generate a separate additive scale (Cronbach's alpha = 0.723), to be entitled the "Task Discretion Index, Managers' Perception" (TDIMP), again ranging from 1 to 4. Earlier studies have found that there tends not to be a high correlation between managers' and employees' perceptions of task discretion; nevertheless it is of interest to examine the extent to which the the TDI and the TDIMP scales are correlated in the WERS04 data. For this purpose, I computed the mean TDI at establishment level, for only those employees who belonged to the largest occupational group.[7] The mean establishment-level estimate of the employees' perception of discretion is measured imprecisely, because of the limited numbers in each establishment who were issued with and responded to the self-completion questionnaire. In the event, the correlation coefficient between the mean establishment-level TDI and the TDIMP was 0.210, significantly positive with a p-value of 0.00. Restricting the sample to those few establishments (86) with at most 25 employees and

where more than 50% of employees responded on this question, the correlation coefficient is somewhat higher, at 0.315.

Table 2 shows the variation in task discretion across major occupational groups and across the education levels of the employee respondents. As the table shows, the TDI and TDIMP are both broadly related as one would expect with the major occupational groups: Managers and Professionals and Associate Professionals, typically seen as the high-skilled groups, report above-average levels of discretion. Nevertheless, aside from these groups there is less of a gradient of the TDI between traditional conceptions of occupational skill level and discretion. The table also brings out that there is a positive association between employee discretion and education levels. Nevertheless, this association is shown only to apply within the upper levels of the education spectrum. At level 3 (two or more A-levels) and below there is essentially no relationship between education and task discretion; but there is a clear upward gradient between levels 3 and 5 (Higher Degree).

Table 1 Distribution of Domains of Task Discretion, 2004

	Domains of Control				
	What tasks	Pace at which work done	How tasks done	Order of tasks	Time of start and finish of work day
A lot	37.6	39.4	51.6	49.8	25.6
Some	36.4	34.6	32.7	33.0	23.6
A little	14.4	15.1	11.3	10.8	16.3
None	11.6	10.8	4.4	6.3	34.5

Task Discretion Index (see text):

Mean	3.002
Range	1-4
Standard Deviation	0.752

Estimates weighted by probability of employee selection.
A small number of cases with missing values is excluded.

Table 2 Task Discretion Indices by Major Occupation Group

Occupation	TDI	TDIMP
Managers	3.46	n.a.

Professionals	3.16	3.30
Associate Professionals	3.13	3.14
Administrative & Secretarial	2.99	2.98
Skilled Trades	2.97	2.83
Personal Services	2.84	2.79
Sales	2.74	2.70
Plant & Machine Operatives	2.73	2.43
Elementary	2.84	2.42
Education Level (Equivalences)		
0. No qualifications	2.95	-
1. GCSE grade D-G	2.92	-
2. GCSE grade A-C	2.88	-
3. Two or more A-Levels	2.97	-
4. Batchelor's degree	3.11	-
5. Higher degree	3.21	-

Estimates weighted by probability of employee selection.
A small number of cases with missing values is excluded.

Particular cases at the 2-digit level also serve to make the point that the TDI is broadly in line with prior expectations. Marketing and sales managers, for example, have high levels of discretion (mean value 3.59) as do production, works and maintenance managers (3.46). By contrast, examples of occupations with low levels of discretion include call centre operators (2.31) and bus, van and coach drivers (2.57). One reason why Elementary Occupations do not all show especially low discretion levels, despite their low-skilled tag, is that this group embraces occupations that nevertheless require non-routine processes. Cleaners and domestics, for example, have slightly above-average discretion (3.05), despite being classed as low-skilled.

Task discretion has been found in detailed case studies and in earlier empirical work to be related strongly to job satisfaction (e.g. Green and Tsitsianis, 2005). WERS04 asks employees about seven separate domains of job satisfaction, each measured against a five-point scale ranging from "very satisfied" to "very dissatisfied". Four of these domains pertain to intrinsic aspects of the job (sense of achievement, scope for initiative, amount of influence, the work itself) while the remaining three tap extrinsic aspects (pay, security and training). Assigning values 1 to 5 to the response points I generated a simple additive index of intrinsic job satisfaction (Cronbach's alpha = 0.849). The individual-level correlation between this intrinsic job satisfaction index and the TDI was 0.371. Some validation of the discretion data is evident in this strong correlation.[8]

To measure organisational commitment, WERS04 asks three items drawn from the Organizational Commitment Questionnaire (Mowday et al. 1982). The questions asked respondents how far they agreed with the statements: "I share many of the values of my organisation", "I feel loyal to my organisation" and "I am proud to tell people who I work for". The responses were against the scale: "strongly agree", "agree", "neither agree nor disagree", "disagree", "strongly disagree". While the number of items is less than desirable, they form the core of the notion of affective commitment, essentially a measure of employee preferences concerning working for their employer.[9] The responses from these three items were averaged to generate an additive scale of Organisational Commitment ranging from 1 to 5, with a Cronbach's scale reliability coefficient of 0.850.

b) The Change in Task Discretion and Organisational Commitment, 1998-2004.

Did the decline in Task Discretion through the 1990s identified by Gallie et al (2004) persist in the present decade? Table 3 presents some initial suggestive evidence to emerge on this issue. It compares responses to identical questions on task direction in WERS98 and WERS04. Only two domains are available for this exercise: control over the pace of work and over how tasks are done. To ensure comparability of the sample base, those working in establishments with less than 10 employees were excluded from the WERS04 data. The comparison is reliable to the extent that the employee samples are representative of the population in each year; to help ensure this, the responses have been weighted.[10]

As can be seen, there has been little change in the extent of discretion over the period. If anything, there appears to have been a small increase in the proportions of employees experiencing "a lot" of control over the pace of work, and over how the work is done. However, these differences are not statistically significant, and according to the managers' reports for the largest occupational group in the establishments there has been a small decrease in discretion. This stability contrasts with the earlier decline in discretion.[11]

In a similar way, Table 4 compares organisational commitment over the two surveys. According to Gallie et al (2001) there was little change during the 1990s in the extent of organisational commitment in the British workforce, a somewhat surprising finding in light of much rhetoric concerning the growth of the high-commitment work organisation. Looking over the more recent period, Table 4 shows that there were small increases in each component of organisational commitment; and the mean level of the Organisational Commitment index increased significantly between 1998 and 2004.

Table 3 Task Discretion, 1998-2004.

Employees' reports	Control over pace of work		Discretion over how work is done	
	% of employees		% of employees	
	1998	2004	1998	2004
A lot	35.4	38.7	48.8	51.2
Some	36.5	34.6	33.6	32.9
A little	16.1	15.3	11.5	11.4
None	13.5	11.4	6.1	4.6
Managers' reports for largest occupational group	Control over pace of work		Discretion over how work is done	
	% of establishments		% of establishments	
	1998	2004	1998	2004
A lot	25.7	23.0	28.8	23.7
Some	38.9	41.2	41.6	41.0
A little	25.1	26.1	20.7	26.0
None	10.4	9.7	9.0	9.3

The base is all private sector employees in establishments with at least 10 workers.

Table 4 Organisational Commitment, 1998 and 2004.

	Shares values		Feels loyalty		Proud to tell	
	1998	2004	1998	2004	1998	2004
Strongly agree	7.5	10.8	16.2	20.1	16.7	20.0
Agree	41.6	41.7	49.0	49.6	39.8	39.7
Neither agree nor disagree	34.8	34.5	23.7	19.9	31.5	29.1
Disagree	12.2	9.9	7.7	7.4	7.9	7.5
Strongly disagree	3.8	3.1	3.6	3.0	4.1	3.6

The base is all private sector employees in establishments with at least 10 workers.

OC Index in 1998:

Mean 3.539

S.E. 0.006

OC Index in 2004:

Mean 3.630

S.E. 0.007

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c) Estimating the Model of Task Discretion.

Tables 5 and 6 present estimates of the impact of organisational commitment and of other variables on task discretion, with Table 5 giving the results for the employee-level measure of discretion (TDI) and Table 6 for the establishment-level measure (TDIMP). In order to be able to compare better the findings from the two levels of analysis, the analysis in Table 5 is based only on employees in the non-managerial occupation groups.

Column (1) of Table 5 gives the OLS estimates, while column (2) presents estimates using instruments for organisational commitment, and column (3) presents fixed-effects estimates which control for establishment-wide unobserved effects on job design.

Variables used as instruments for organisational commitment in column (2) are as follows. First, two variables are included which capture management's report on whether employees in the establishment are "led to expect long-term employment in this organisation". One dummy variable is included for "strongly agree"; another dummy represents "disagree" or "strongly disagree". Second, two variables are included which capture whether, in the management's view, "employees here are fully committed to the values of the organisation". Again, one dummy variable captures "strongly agree", while another represents "disagree" or "strongly disagree". By using variables taken from the management questionnaire, one can avoid potential common method bias, that is, the bias due to unobserved heterogeneity associated with personal traits affecting both dependent and independent variables, since presumably judgements made by manager respondents are not correlated with those made by individual employees. Using these variables as instruments depends on the assumption that they do not themselves affect job design for individual employees in the establishment except via the effect that they may have on the organisational commitment of individuals. Moreover, in order to provide well-defined instrumental variable estimates, the instruments should also have a strong association with organisational commitment.

As usual in such cases these assumptions could be questioned. For example, even though the expectation of long-term employment is not obviously connected directly to autonomy in the workplace other than through commitment, it would not be hard to

manufacture a possible explanation. Accordingly, diagnostics tests are needed to examine whether the instrumental variable assumptions are satisfied in practice. The Hansen J statistic for overidentification is computed to be 2.486, which implies that one cannot reject the null hypothesis that the instruments are uncorrelated with the error term in the equation estimating task discretion ($\chi^2_{0.01,3} = 11.3$; P-value = 0.478). In that sense, they are correctly excluded from the specification.

To test for whether the task discretion is under-identified, the Anderson canonical correlation LR statistic is computed to be 209.21, which implies that the null hypothesis that the equation is not identified (the instruments not correlated with commitment) can be rejected ($\chi^2_{0.01,4} = 13.3$; P-value=0.000). There is sufficient correlation between the instruments and employee organisational commitment. However, it could still be the case that instruments are "weak", which would mean that the estimates are biased (usually downwards) in finite samples and that the significance level is higher than implied by the reported t-statistics (Murray, 2006). The test for weak instruments is the first-stage F statistic, which is computed to be 52.54; this implies that the true significance level is below 10% when the nominal level is 5% (critical value 19.93). Thus the instruments are not weak.

Consider now the findings from Table 5. Do they support the hypotheses proposed in Section 2?

An initial striking finding is that task discretion, as predicted (*H1*), is positively and strongly affected by workers' organisational commitment. This conclusion emerges first in the OLS estimate shown in column (1), but it is supported by the IV estimate shown in column (2), the latter showing only a slightly lower coefficient, not significantly different. I conclude that jobs for workers with greater commitment are indeed afforded greater discretion. Moreover, the direct impact is substantial: using the IV estimate, a one standard deviation increase in commitment raises task discretion by 0.182, which is 24% of the standard deviation of task discretion.

Put another way, if we compare the job designs of workers who on average "neither agree nor disagree" with the three organisational commitment items with otherwise similar workers who "strongly agree" with the items, the effect on discretion of the raised commitment would be 0.44, more than the equivalent of switching from a

customer service occupation to a science and technology professional occupation which would normally be considered to be much more skilled.

The link between task discretion and skill (*H2)* is investigated first by including 24 2-digit occupational dummies, on the presumption that higher level occupations require greater skills. The least discretion is generally afforded to some of the lowest-ranking occupations (e.g. customer services, comprising call centre operators and other customer care occupations). Yet there are exceptions, with, for example, health professionals also showing low task discretion. Closer inspection reveals that this low-discretion finding for health professionals is mainly driven by pharmacists/pharmacologists in large workplaces. In all lines of work those in supervisory positions have, as expected and noted above, substantively greater levels of discretion. Another way of investigating *H2* is through the link with computer usage. Jobs with a greater range of computer usages can be seen as loosely linked with skill and, as can be seen, the estimated impact of this variable is positive and significant.

Thus the link with skill is weak though broadly positive, in line with prior information about labour processes in specific occupations, and in line with the normal expectation in sociological literature. Nevertheless, there are groups of workers with relatively low discretion despite their high skill levels. The mixed picture is consistent with the ambiguous story implied by (4). For such high-skill/low discretion occupations the explanation is that any extra productivity that might be obtained from giving them more discretion than less-skilled workers is more than outweighed by the loss of output from potentially lower effort levels that might accompany greater discretion.

H3 concerns the link between the person-job skills match and discretion. Respondents were asked "How well do the work skills you personally have match the skills you need to do your present job?", and could answer on a five point scale (Much higher/ a bit higher/ about the same/ a bit lower/ much lower). Table 5 shows that, for a given job skill level, workers who perceive that their skills match the required job skills are afforded more discretion than those who were under-skilled for the job. For this group of under-skilled (only about 5 % of the sample), employers have granted them less leeway because discretion for them would be less productive or even of negative value if it raised the frequency of inefficient actions. By contrast, those who thought

that they had more skills than needed (55% of the sample) were afforded neither more nor less than the discretion allowed for those whose skills were matched.

Consider now the additional variables included because they carry information about the technology or work organisation that may independently affect the discretion that workers experience (thus affecting the production function). First I included an indicator of the use of a Just-In-Time inventory control system on the grounds that this system requires less individual freedom to alter the pace and timing work. Some 34% of private sector employees work in establishments deploying a JIT system in Britain (see Appendix, Table A1). While the estimated effect on their discretion has a negative coefficient, it is not statistically different from zero in either the OLS or IV specifications. Thus, the one included establishment-level technical characteristic of production has a negligible association with discretion.

Aspects of work organisation, however, are important. Home working, in particular, is expected to be associated with greater discretion, since for home workers managerial supervision of the labour process is restricted to problematic technologies of distance surveillance, uneasy home visits and the setting of behaviour-distorting targets (Felstead et al., 2003). The survey does not record whether individual workers are home workers, but it does report the proportion of employees who are working largely from home during working hours. Consistent with this expectation, workers in establishments with a larger proportion of home workers experience on average greater task discretion.

The effect of teamworking, as a distinct form of work organisation, on task discretion has been investigated by Harley (2001) using data from WERS98. As Harley describes, two distinct hypotheses have been posed regarding the role of teamworking in shaping the design of individual jobs. Optimistic perspectives associated with HRM (Harley cites, among others, Katzenbach and Smith (1993)) have expected teams to raise employee discretion. By contrast critical accounts, for example that by Marchington (2000), have held that teamworking's putative liberating effect on job design was illusory and that teams instead led to new forms of control, to work intensification and to limited, rather than enhanced, discretion. Harley's paper constitutes an advance in our understanding of the effect of teams on employees. Using the nationally representative data available in WERS98 he finds that on average teams neither raise nor lower discretion significantly. Harley argues that the

introduction of teams has had little or no effect because teams are managerially driven, and/or teams do not constitute a major change in hierarchical work organisation. His analysis, however, is confined to establishments where either none or all of the establishment's largest occupation group (LOG) are in a team, and with further restrictions this means that only a minority of employees in WERS98 are included in the analysis. Moreover, Harley includes only one category of team in his analysis. Here I include both teams that appoint their own leaders and those that do not; and both teams which, according to managers, "jointly decide how work is done" and those that do not. These two variables are each interacted with an index of the proportion of the largest group that is working in teams.

It can be seen from Table 5 that the impact of team working on discretion is significant but differentiated. Consider, first, teams where members do not jointly decide how work is done. Comparing establishments with no teamworking in the largest occupational group with establishments where there is 100% teamworking, discretion is 0.65 lower, consistent with the critical accounts of teamwork. However, for those teams where team members jointly decide about work (covering establishments with 49% of employees), the negative impact of teams is almost exactly neutralised: the joint impact is -0.002 and statistically insignificant. For these employees the essence of Harley's neutral finding is reproduced here. Finally, whether the team is self-led or otherwise appears to have no significant effect on whether the team enhances or diminishes employee discretion. These findings imply that, while the critical accounts of teamwork's effect on employees find support for about half of employees, there is a need to distinguish between team types in order to capture heterogeneity in their effects on work organisation.

Also expected to have a positive association with individual discretion is where the firm introduces various flexible hours policies. One can sometimes distinguish between whether the policy is there to serve the flexibility needs of the employee (e.g. "flexitime") and whether its function is mainly to provide flexibility for the employer (e.g. zero hours working). I expected the former to be associated with higher perceived discretion. The data, which is derived from the management questionnaire, allow us to identify whether each flexible working time arrangement is applied to some workers in the establishment, and not whether any given employee can access

that arrangement. Nevertheless, it might be presumed that in many establishments the policies are generalised to all or most workers.

The pattern of coefficient estimates implies that task discretion for employees is raised where there is a "flexitime" policy in place (no set starting and finishing times, though set overall hours). This finding is as expected, and serves if nothing else to confirm the reliability of workers' perceptions of discretion. Conversely, discretion is lowered in establishments where there are flexible shifts; and the coefficient estimates for a zero hours policy and for annualised work hours are negative though insignificant. These types of flexibility policies help employers to call on workers to work when employers want them to.

Where managers report having direct systems of quality monitoring might also be expected to have a negative bearing on workers' task discretion. Managers were asked how they monitored the performance of employees, and allowed to state as many methods as they used, including direct supervisor/manager monitoring, monitoring by a separate inspectors, self-monitoring, records of faults and complaints, customer surveys, and other unspecified methods. Most establishments (82%) use managers and supervisors to directly monitor quality, and this form of monitoring carries a negative coefficient. However, with a p-value of 0.16 the coefficient is not quite significant at conventional levels. The impacts on discretion of other forms of monitoring were negligible.

A further set of establishment characteristics concerns the use of targets. It was hypothesised by Gallie et al. (2004) that the growing use of targets to control production may have been one of the causes of the observed reductions in employee discretion during the 1990s. The idea is that where targets are in force line managers might need to control work more closely to achieve them, but it is also possible that some targets could be imposed for employees precisely in situations where monitoring is costly. Responding managers were asked to state whether they had to meet any targets over a range of input and performance variables (profits, labour costs, sales, absenteeism and so on). A dummy variable was constructed to indicate whether or not any targets were used in the establishment. Only 12% of employees worked in establishments with no targets. While the point estimate on the dummy variable for "No Targets" is positive it is not statistically significant. This finding suggests that a rising use of targets is unlikely to have been a major explanation for

declining discretion during the 1990s, though it is conceivable the explanation would be more relevant in the public sector.

Person-level and establishment-level controls were also added, to account for otherwise unspecified factors. that might influence job design. It is found that discretion is greater for older workers, and for non-whites. Discretion is set significantly lower for trade union members, a finding which has a straightforward interpretation. If employers fear that trade union members are more likely to behave in their own interests or those of the union, rather than the employer, they are likely to design jobs that afford workers less control over their actions. Alternatively, it could be that workers in low discretion jobs are more easily organised.

While the estimates given in columns (1) and (2) have included standard errors adjusted for clustering within establishments, they do not allow for the possible unobserved effects of establishment characteristics on individual job design, some of which might be correlated with individual characteristics and hence generating biased estimates. By definition these establishment-specific characteristics are unobserved, but I take them to include both the effects of management culture and the particular production function of the establishment, both of which might be correlated with variables that are observed. The estimation shown in column (3) seeks to address this possibility. It shows the establishment fixed-effects estimates. As can be seen, there is little change from the magnitude of the coefficients given in columns (1) and (2), which implies that any unobserved fixed effects are largely orthogonal to the individual observed effects. Nevertheless, it is also the case that the R^2 value is raised quite substantially from 0.18 to 0.32, suggesting that a notable amount of the variance of discretion can be accounted for by between-establishment variance. The test of the null hypothesis that the additions of establishment fixed effects does not account for additional variance is rejected at the level p=0.000, with F-statistic 1.882, critical value 1.000.

d) Robustness Checks.

Some alternative specifications have been used in order to test the robustness of the findings.

One alternative was to utilise as independent variable the establishment-level index of task discretion derived from the reports of managers, TDIMP. It may be recalled that this variable applies to the discretion afforded, in the manager's view, to the largest occupational group in the establishment, which may not be the same as for other employees. Moreover, the variable to be explained here is the average discretion of employees in that group, rather than directly with the individual-level discretion in jobs. For these reasons, the analysis of TDI at the individual level has been preferred to the analysis of TDIMP at the establishment level. Nevertheless, it will be re-assuring for the main findings if the same or similar relationships are shown at the establishment level, and with data from a different informant.

Table 6 presents the estimates of TDIMP across 1554 establishments. I utilise the index of full employee commitment as perceived by the manager which ranges from 1 ("strong disagreement") to 5 ("strong agreement").[12] As with the employee-level analysis, the managers' estimate of commitment may be endogenous, and for this analysis it is instrumented by the two variables capturing whether employees are led to expect long-term employment in the organisation. The Hansen J statistic for overidentification was 0.092 (p=0.762), suggesting that it is acceptable to reject the hypothesis that these instruments are correlated with the error term. The Anderson canonical correlation statistic is 105.56 (p=0.00), which implies that the excluded instruments are correlated with organisational commitment; in other words, the equation is identified. Finally, the Cragg-Donald F-statistic was 53.6 which implies that the instruments are not weak.

Table 6 shows that discretion is enhanced in establishments with home working arrangements, and rises with the proportion of employees working at home. The index of team use is negatively associated with employee discretion (consistent with Table 5) but in establishments where teams are explicitly said to allow for teams to jointly decide how work is to be done the teams are positively associated with individual discretion as perceived by managers: the coefficient for this group is calculated as 0.426-0.106 = 0.320, which is also found to be statistically different from zero (p=0.007). In contrast to Table 5, then, this finding implies that there are some establishments (roughly half) where teams positively enhance discretion, in line with the story told by the more optimistic perspective on teamworking. The difference between this finding and the neutral finding using the individual-level data may be

due either to the differing level of analysis or to the differing informants about discretion.[13]

Another distinctive finding from this establishment-level analysis is evidence that employees in establishments with no targets are here estimated to have substantially greater discretion than those in establishments where one or more targets are set. The difference is estimated as 0.172 in the IV estimates, which amounts to just under a quarter of one standard deviation in TDIMP. This finding contrasts with that for the individual-level analysis which found only a small and insignificant effect. While one cannot be confident about the reasons for this difference in findings, one possibility is that managers in establishments that set targets feel at the same time that they are limiting employees' discretion, even if the employees do not experience it as any more restrictive than a no-target regime, (and indeed the employees need not be aware of the targets).

Turning again to the central hypothesis of this paper, this establishment-level analysis confirms that there is a strong association of organisational commitment with employee discretion. The IV estimate implies that moving from a state where employee commitment is neither agreed nor disagreed with (16% of establishments), to a state where the manager strongly agrees that the employees are fully committed (19% of establishments), is associated with a rise in TDIMP by 0.520, which is 72% of the latter's standard deviation across establishments, and more than the average difference in discretion associated with moving from an elementary occupation to a professional occupation. The link with skill is also confirmed to be broadly positive, as implied in the occupational rankings (though with this establishment-level analysis there are no finer disaggregations of occupation than the 1-digit level).

Two further robustness checks were carried out. First, as an alternative to occupation as a measure of skill, in the individual-level analysis I entered the employees' achieved qualification level. This analysis showed that, after conditioning on all the other variables included hitherto in the analysis, the level of discretion increases between qualification levels 4 and 5 (as with the raw data shown in Table 2); however, discretion is also higher at levels 0 and 1 than it is at levels 2, 3 and 4. This finding re-affirms what the earlier analysis has shown, that the relationship between discretion and skill (here loosely measured by the job-holder's education level) is not necessarily unambiguously positive as is often assumed. However, the analysis also

showed that the pattern of other findings was not substantially altered by the inclusion of education rather than occupation in the analysis.

Second, in a further estimation the analysis was restricted to the employees who belonged to the largest occupational group (LOG) in the establishment. This sample restriction has the advantage that variables that were intended to apply to the LOG would be in principle more accurately measured; the disadvantage is that the sample size falls by more than half to 5,559. However, it is re-assuring to confirm that the pattern of findings remains largely unchanged from those obtained with the full sample of 11,845 employees. The central finding of a substantial impact of commitment on discretion is again found, with a coefficient of 0.243 (0.014), which is not much different from the coefficient estimates shown in Table 5. The other conditioning variables follow the same pattern, but with one exception. For this restricted sample, consistent with expectations the presence of a Just-In-Time production system is negatively associated with discretion, and unlike for the full sample this coefficient is statistically significant at the 10% level. The estimated coefficient is -0.059 (0.031).[14]

5. Conclusion.

This paper proposes the importance for labour economics to achieve a greater understanding of autonomy in the workplace, and has developed an analysis of the factors underlying task discretion. I argue that the key axis for understanding discretion is the fundamental post-Fordist trade-off between the positive effects of discretion on potential output per employee and the negative effects of greater leeway on work effort. This contrasts with the more commonly posed trade-off (in efficiency-wage theory) for employers, between the benefits of greater work effort from close control and the increasing monitoring costs. The post-Fordist trade-off leads to the hypothesis that the design of discretion into jobs is highly dependent on workers' preferences for supplying effort to the employer.

Using data from the Workplace Employee Relations Survey 2004, the paper finds that, as expected, task discretion is strongly associated with affective organisational commitment. The loyal workers are the ones with greater autonomy at work.

The paper also confirms that task discretion is associated with job skill. It finds that discretion is lower, as expected, in the less skilled jobs. Managerial and professional jobs have above-average discretion. However, there are some notable exceptions. There are quite high-skilled jobs that do not have high levels of discretion, and some low-skilled jobs where there appears to be some considerable autonomy. The formal model has suggested an explanation for this ambiguity, namely that in some high-skilled jobs the costs of lower effort may be high, and if in these jobs the benefits of discretion are perceived to be limited employers may opt to design jobs with little discretion. This is not, of course, the only possible explanation for exceptions to the traditional association between discretion and skill. An alternative explanation is that some traditionally-termed low-skilled jobs, which may require few or no qualifications, may nevertheless entail largely non-routine activities: in such cases it can be difficult for employers to closely specify work tasks. The paper has also shown that it is important for the skills of the employee and the job to be well-matched. Under-skilled workers, especially, need more supervision and report lower levels of discretion.

Certain forms of work organisation have been shown to be associated significantly with discretion. Most notably, and unsurprisingly, homeworking is found to permit high levels of autonomy. Of especial interest is the impact of teamworking. It is shown that, contrary to the earlier work of Harley (2001), teamworking has a differentiated effect on task discretion. For just under half (47%) of the employees who work in establishments where teams are prevalent, managers indicate that the teams are not permitted to jointly decide how work is done. In those cases teams are associated with a reduction in individual task discretion, consistent with the negative perspective on teams advanced by some recent critical accounts. In the remaining establishments, where managers see teams as having some leeway, employees have neither high nor low levels of self-perceived discretion; however, in the managers' own perceptions, employees have higher levels of individual discretion than where there are either teams that do not have joint decision-making powers or where there are no teams at all.

Companies' policies on flexible working also have an impact on workers' task discretion, but the direction of the impact depends on the form of flexibility, thus demonstrating the need for care when discussing flexibility as a strategy. Where

flexibility is introduced as something to benefit employees (as with home-working or flexitime schemes) it has, as expected, a positive effect on discretion. Where the policies are to suit the employers' needs (e.g. annualised hours contracts) this tends to reduce discretion.

Other findings suggest that it is unlikely that the increased use of target-setting could account for the decline of discretion observed in the 1990s. Although the absence of targets is significantly associated (in the establishment level analysis) with greater task discretion for workers, the magnitude of the coefficient is fairly small. A further finding is that, at least in two domains, task discretion has remained fairly stable in British workplaces between 1998 and 2004. This finding of stability is consistent with recent findings from alternative individual-level survey data that task discretion remained unchanged between 2001 and 2006 (Felstead et al., 2007).

It will be important in future work to further our understanding of autonomy in the workplace, if only because of its large impact on employee well-being especially in effort-intensive jobs. Moreover, following on from the finding of a large and significant role for commitment in affecting the design of autonomy into jobs three further lines of enquiry suggest themselves. First, if worker autonomy is assumed to be so efficient in a flexible-specialisation productive environment, one can see more clearly the rationale behind high-commitment strategies being deployed in many modern workplaces. The question which remains is to what extent such high-commitment policies are successful in generating commitment, and in what circumstances (Wood and Albanese, 1995). Along parallel lines, Akerlof and Kranton (2005) summarise findings on organisational behaviour from sociology in order to criticise the exclusive focus of economics on monetary incentives; they advocate a research programme for economists to elaborate the implications of identity-creating investments by firms (for example, Green, 2000). Such a programme needs to recognise, however, that investing in changing people's preferences is not without limitations and contradictions, as is recognised in both sociological and management literatures (e.g. Argyris, 1998) and may involve unresolved normative dilemmas. Second, the analysis here suggests that the relationship between organisational commitment and worker well-being is mediated strongly by autonomy, and without this link it may be questioned whether commitment should be seen as a positive element in worker well-being. Third, following on from that, it is possible that the

combination of autonomy and commitment is, from the perspective of workers, a mixed blessing. Commitment, and its close relative workplace trust, can be misplaced if employers are not seen to reciprocate the exchange that comes from workers identifying with their employers' beliefs. Moreover, both discretion and commitment are predicted by competitive theory to have an impact on pay, since they can be regarded as capturing important compensating differentials. The consequences for pay, therefore, of high levels of commitment and autonomy deserve further empirical investigation.

Table 5 Determinants of Employee Task Discretion

	(1) OLS	(2) IV	(3) Estab. FE
Organisational commitment	0.226	0.219	0.224
	(0.010)**	(0.082)**	(0.009)**
OCCUPATION, Ref: Sci&Tech Profs			
Health Professionals	-0.419	-0.422	-0.439
	(0.251)+	(0.249)+	(0.146)**
Teaching & Research Professionals	0.043	0.045	0.011
	(0.069)	(0.073)	(0.073)
Business & Public Service Profs	-0.041	-0.039	0.073
	(0.051)	(0.055)	(0.056)
Sci & Tech Associate Professionals	-0.143	-0.143	-0.138
	(0.058)*	(0.058)*	(0.053)**
Health & Soc. Welfare Ass. Profs	0.040	0.042	-0.053
	(0.057)	(0.061)	(0.063)
Protective Service Occupations	-0.088	-0.086	-0.195
	(0.286)	(0.288)	(0.284)
Culture/Media/Sports Occupations	0.003	0.004	0.041
	(0.054)	(0.057)	(0.072)
Business/Public Service Ass. Profs	0.067	0.068	0.115
	(0.040)+	(0.043)	(0.042)**
Administrative Occupations	-0.082	-0.082	-0.045
	(0.038)*	(0.039)*	(0.040)
Secretarial and Related	-0.175	-0.173	-0.129
	(0.053)**	(0.058)**	(0.051)*
Skilled Agricultural Trades	-0.049	-0.048	-0.202
	(0.099)	(0.101)	(0.143)
Skilled Metal & Electrical Trades	-0.040	-0.040	-0.031
	(0.047)	(0.046)	(0.047)
Skilled Construction & Building	0.051	0.052	-0.023
	(0.056)	(0.057)	(0.073)
Textiles/Printing/Other Skilled	0.071	0.070	-0.009
	(0.059)	(0.059)	(0.062)
Caring Personal Service	-0.192	-0.190	-0.302
	(0.059)**	(0.065)**	(0.065)**
Leisure/Other Personal Service	-0.213	-0.210	-0.020
	(0.073)**	(0.080)**	(0.072)
Sales	-0.143	-0.142	-0.126
	(0.044)**	(0.045)**	(0.049)*
Customer Service	-0.360	-0.361	-0.252
	(0.068)**	(0.068)**	(0.055)**
Process, Plant & Machine Operatives	-0.166	-0.167	-0.136
	(0.046)**	(0.046)**	(0.046)**
Transport Operatives	-0.150	-0.149	-0.127
	(0.056)**	(0.056)**	(0.055)*
Elementary Trade/Plant/Storage	-0.071	-0.071	-0.052
	(0.054)	(0.054)	(0.050)
Elementary Administrative/Service	-0.037	-0.036	-0.107
	(0.047)	(0.048)	(0.049)*
Supervisor	0.254	0.256	0.254
	(0.017)**	(0.022)**	(0.016)**
Underskilled	-0.172	-0.174	-0.162
	(0.041)**	(0.049)**	(0.031)**
Overskilled	-0.015	-0.016	-0.019
	(0.015)	(0.022)	(0.014)
Technology and work organisation variables:			
Number of uses of computer in job	0.029	0.029	0.033
	(0.004)**	(0.004)**	(0.003)**

'Just-In-Time' Production	-0.017	-0.017	
	(0.021)	(0.021)	
Proportion working at home	0.175	0.178	
	(0.103)+	(0.108)+	
Index of team use in largest occupational group	-0.066	-0.065	
	(0.028)*	(0.028)*	
Index of self-led team in largest occupational group	0.025	0.025	
	(0.052)	(0.052)	
Index of team discretion in largest occupational group	0.062	0.063	
	(0.023)**	(0.023)**	
Flexible Working Time Arrangements			
Flexitime	0.079	0.079	
	(0.020)**	(0.020)**	
Flexible shifts	-0.033	-0.033	
	(0.019)+	(0.019)+	
Compressed-hours working	-0.001	-0.001	
	(0.026)	(0.026)	
Annualised hours job	-0.043	-0.043	
	(0.029)	(0.029)	
Zero hours work	-0.039	-0.040	
	(0.040)	(0.040)	
Quality Monitoring Arrangements			
Monitoring by Manager/Supervisor	-0.041	-0.042	
	(0.026)	(0.027)	
Monitoring by Inspector(s)	-0.002	-0.002	
	(0.020)	(0.020)	
Monitoring by Records of Faults	-0.018	-0.018	
	(0.021)	(0.021)	
Monitoring by Customer Surveys	-0.008	-0.007	
	(0.020)	(0.021)	
No Targets	0.023	0.023	
	(0.029)	(0.029)	
25 or more employees	-0.000	-0.001	
	(0.023)	(0.025)	
Trade Union Member	-0.090	-0.091	-0.047
	(0.022)**	(0.024)**	(0.021)*
Age	0.018	0.018	0.015
	(0.004)**	(0.005)**	(0.004)**
Age Squared	-0.000	-0.000	-0.000
	(0.000)**	(0.000)**	(0.000)**
Male	-0.018	-0.019	-0.029
	(0.019)	(0.020)	(0.017)+
White	-0.080	-0.081	-0.075
	(0.038)*	(0.040)*	(0.030)*
Constant	1.818	1.847	1.808
	(0.115)**	(0.342)**	(0.090)**
Observations	11845	11845	11845
Mean (sd) of dependent variable	2.928	2.928	2.928
	(0.752)	(0.752)	(0.752)
R^2	0.18		0.32

Robust standard errors in parentheses; + significant at 10%; * significant at 5%; ** significant at 1%. For columns (1) and (2) standard errors are also robust to clustering within establishment. Weighted estimates. The sample is all non-managerial employees in the private sector. Column 3 controls for 1200 establishment fixed effects.

Table 6 Determinants of Managers' Estimates of Employee Task Discretion

	(1) OLS	(2) IV
Employee Commitment (Managers' perception)	0.117	0.260
	(0.037)**	(0.124)*
OCCUPATION, Ref: Professional Occupations		
Associate Professionals	0.088	0.094
	(0.102)	(0.103)
Administrative & Secretarial	-0.031	-0.022
	(0.110)	(0.109)
Skilled Trades	0.029	0.054
	(0.111)	(0.109)
Personal Service	-0.142	-0.150
	(0.126)	(0.124)
Sales	-0.173	-0.141
	(0.111)	(0.111)
Plant & Machine Operatives	-0.285	-0.243
	(0.108)**	(0.112)*
Elementary	-0.488	-0.465
	(0.112)**	(0.110)**
Technology and work organisation variables:		
'Just-In-Time' Production	0.026	0.040
	(0.063)	(0.065)
Arrangement to work from home in normal hours	0.246	0.231
	(0.066)**	(0.067)**
Proportion working at home (almost) always	0.599	0.484
	(0.292)*	(0.319)
Index of team use in largest occupational group	-0.227	-0.225
	(0.082)**	(0.084)**
Index of self-led team in largest occupational group	0.116	0.106
	(0.137)	(0.133)
Index of team discretion in largest occupational group	0.450	0.426
	(0.081)**	(0.084)**
Flexible Working Time Arrangements		
Flexitime	0.038	0.031
	(0.055)	(0.056)
Flexible shifts	-0.118	-0.091
	(0.063)+	(0.067)
Compressed-hours working	0.040	0.021
	(0.081)	(0.082)
Annualised hours job	-0.041	-0.082
	(0.092)	(0.101)
Zero hours work	-0.001	0.018
	(0.090)	(0.096)

Quality Monitoring Arrangements		
Monitoring by Manager/Supervisor	-0.075	-0.081
	(0.072)	(0.071)
Monitoring by Inspector(s)	-0.019	-0.014
	(0.064)	(0.064)
Monitoring by Records of Faults	-0.105	-0.091
	(0.064)	(0.068)
Monitoring by Customer Surveys	0.028	0.023
	(0.065)	(0.066)
No targets	0.156	0.172
	(0.073)*	(0.074)*
25 or more employees	-0.096	-0.077
	(0.050)+	(0.056)
Percent union members in establishment	-0.00124	-0.00102
	(0.00113)	(0.00119)
Constant	2.630	2.042
	(0.193)**	(0.520)**
Observations	1554	1554
Mean (sd) of dependent variable	2.894 (0.720)	2.894 (0.720)
R^2	0.25	

Robust standard errors in parentheses; + significant at 10%; * significant at 5%; ** significant at 1%. The dependent variable is the index of managers' estimate of individual employee task discretion in largest occupational group. Weighted estimates.

References.

Aghion, P. and J. Tirole (1997). "Formal and Real Authority in Organizations." *Journal of Political Economy* 105 (1): 1-29.

Akerlof, G. A. and R. E. Kranton (2005). "Identity and the economics of organizations." *Journal of Economic Perspectives* 19 (1): 9-32.

Allen, N. J. and J. P. Meyer (1990). "The measurement and antecedents of affective, continuance and normative commitment to the organization." *Journal of Occupational Psychology* 63: 1-18.

Argyris, C. (1998). "Empowerment: The Emperor's New Clothes." *Harvard Business Review* (May-June): 98-105.

Athey, S. and Roberts, J. (2001) Organizational Design: Decision Rights and Incentive Contracts. *American Economic Review*, 91, 2, 200-205.

Batt, R. (2004). "Who Benefits from Teams? Comparing Workers, Supervisors, and Managers." *Industrial Relations* 43 (1): 183-212.

Braverman, H. (1974). *Labor and monopoly capital*. New York, Monthly Review Press.

Bryson, A. and R. Freeman (2007). *Doing the right thing? Does fair share capitalism improve workplace performance*. London, Department of Trade and Industry, Employment Relations Research Series No. 81.

Clinton, M., P. Totterdell and S. Wood (2006). "A Grounded Theory of Portfolio working." *International Small Businness Journal* 24 (2): 179-203.

Cohen, A. and U. E. Gattiker (1994). "Rewards and organizational commitment across structural characteristics -- a meta-analysis." *Journal of Business Psychology* 9 (2): 137-157.

Cooper, R. (1973). "How jobs motivate." *Personnel Review* 2 (2): 4-12.

Davis, L. E. (1966). "The Design of Jobs." *Industrial Relations* 6: 21-45.

Department of Trade and Industry. Employment Markets Analysis and Research et al., *Workplace Employee Relations Survey, 2004; Cross-section Survey, 2004 and Panel Survey, 1998-2004: Wave 2* [computer file]. Colchester, Essex: UK Data Archive [distributor], December 2005. SN: 5294.

Dessein, W. (2002). "Authority and Communication in Organizations." *Review of Economic Studies* 69: 811-838.

European Foundation for the Improvement of Living and Working Conditions (2007). *Fourth European Working Conditions Survey*. Luxembourg, Office for Official Publications of the European Communities.

Felstead, A., D. Gallie and F. Green (2002). *Work Skills In Britain 1986-2001*. Nottingham, DfES Publications.

Felstead, A., N. Jewson and S. Walters (2003). "Managerial control of employees working at home." *British Journal of Industrial Relations* 41 (2): 241-264.

Felstead, A., D. Gallie, F. Green and Y. Zhou (2007). *Skills At Work, 1986 to 2006*. University of Oxford, SKOPE.

Gallie, D., A. Felstead and F. Green (2001). "Employer Policies and Organisational Commitment in Britain 1992-7." *Journal of Management Studies* 38 (8): 1081-1102.

Gallie, D., A. Felstead and F. Green (2004). "Changing Patterns of Task Discretion in Britain." *Work, Employment and Society* 18 (2): 243-266.

Green, F. (2000). "The impact of company human resource policies on social skills: Implications for training sponsorship, quit rates and efficiency wages." *Scottish Journal of Political Economy* 47 (3): 251-272.

Green, F. and N. Tsitsianis (2005). "An Investigation of National Trends in Job Satisfaction in Britain and Germany." *British Journal of Industrial Relations* 43 (3): 401-430.

Guy, F. and P. Skott (2005). Power-Biased Technological Change and the Rise in Earnings Inequality, University of Massachusetts, mimeo.

Harley, B. (2001). "Team Membership and the Experience of Work in Britain: an Analysis of the WERS98 Data." *Work, Employment and Society* 15 (4): 721-742.

Karasek, R.A. (1979) "Job demands, job decision latitude, and mental strain: Implications for job redesign." *Administrative Science Quarterly*, 24, 285-308.

Lehto, A.-M. and H. Sutela (1999). *Efficient, More Efficient, Exhausted*. Helsinki, Statistics Finland.

Lehto, A.-M. and H. Sutela (2005). *Threats and Opportunites. Findings of Finnish Quality of Work Life Surveys 1977-2003*. Helsinki, Statistics Finland.

Leiulfsrud, H. and O. Dahl (2005). "Democratization of work? Power, hierarchy and work autonomy in Norway, 1982-1999." *Tidsskrift For Samfunnforskning* 46 (2): 159-186.

Lincoln, J. R. and A. L. Kalleberg (1990). *Culture, Control and Commitment*. Cambridge, Cambridge University Press.

Mathieu, J. E. and D. M. Zajac (1990). "A review and meta-analysis of the antecedents, correlates and consequences of organizational commitment." *Psychological Bulletin* 80 (2): 171-194.

Meyer, J., D. Stanley, L. Herscovitch and L. Topolnytsky (2002). "Affective, continuance, and normative commitment to the organization: A meta-analysis of antecedents, correlates, and consequences." *Journal of Vocational Behavior* 61 (1): 20-52.

Millward, N., A. Bryson and J. Forth (2000). *All Change At Work?* London, Routledge.

Mowday, R.T., Steers, R.M. and Porter, L.W. (1979) The measurement of organizational commitment. *Journal of Vocational Behavious* **14**, 224-247.

Mowday, R.T., Porter, L.W. & Steers, R.M. (1982). *Employee-organization linkages*: *The psychology of commitment, absenteeism, and turnover*. New York: Academic Press.

Murray, M. P. (2006). "Avoiding Invalid Instruments and Coping with Weak Instruments." *Journal of Economic Perspectives* 20 (4): 111-132.

Peters, T. (1992) *Liberation Management.* London: Macmillan.

Piore, P. and C. Sabel (1984). *The Second Industrial Divide: Possibilities for Prosperity*, New York, Basic Books.

Spenner, K. I. (1990). "Skill. Meanings, Methods and Measures." *Work And Occupations* 17 (4): 399-421.

Taylor, M. P. (1996). "Earnings, independence or unemployment: Why become self-employed?"" *Oxford Bulletin of Economics and Statistics* 58 (2): 253-266.

Theorell, T. (2004). "Democracy at Work and its Relationship to Health". *Emotional and Physiological Processes and Positive Intervention Strategies*, edited by P. L. Perrewé and D. C. Ganster. Amsterdam, Elsevier.

Vogel, J. and T. Theorell (2006). "Social Welfare Models, Labor Markets, and Health Outcomes". *Healthier Societies. From Analysis to Action.*, edited by J. Heymann, C. Hertzman, M. L. Barer and R. G. Evans. Oxford, Oxford University Press.

Walton, R. E. (1985) 'From control to commitment in the workplace', *Harvard Business Review*, 85, 2: 77-84.

Wood, S. and M. T. Albanese (1995). "Can we speak of a high commitment management on the shop floor?" *Journal of Management Studies* 32 (2): 215-247.

Appendix.
Independent Variables: Descriptive Statistics.

Variable	Notes	Weighted Mean (11,845 employees)	Weighted Mean (1554 establ-ishments)
Organisational Commitment	3-item average additive index – see text	3.607	3.897
2-Digit SOC			
22	Health Professionals	0.002	
23	Teaching & Research Professionals	0.017	
24	Business & Public Service Profs	0.032	
31	Sci & Tech Associate Professionals	0.023	
32	Health & Soc. Welfare Ass. Profs	0.025	
33	Protective Service Occupations	0.001	
34	Culture/Media/Sports Occupations	0.017	
35	Business/Public Service Ass. Profs	0.085	
41	Administrative Occupations	0.157	
42	Secretarial and Related	0.046	
51	Skilled Agricultural Trades	0.004	
52	Skilled Metal & Electrical Trades	0.055	
53	Skilled Construction & Building	0.019	
54	Textiles/Printing/Other Skilled	0.022	
61	Caring Personal Service	0.038	
62	Leisure/Other Personal Service	0.018	
71	Sales	0.102	
72	Customer Service	0.039	
81	Process, Plant & Machine Operatives	0.069	
82	Transport Operatives	0.049	
91	Elementary Trade/Plant/Storage	0.047	
92	Elementary Administrative/Service	0.090	
Supervisor		0.270	

Under-Skilled	Skills “a bit lower” or “much lower” than needed to do job	0.049	
Over-skilled	Skills “a bit higher” or “much higher” than needed to do job	0.547	
Number of uses of computer in job	Up to twelve computer uses	2.937	
'Just-In-Time' Production		0.342	0.240
Arrangement to work from home in normal hours	For some employees in establishment		0.222
Proportion working at home		0.019	0.019
Index of team use in LOG*.	Proportion of LOG working in teams	0.662	0.481
Self-led team use in LOG*.	Proportion in teams interacted with “team members are able to appoint their own team leaders	0.030	0.038
Index of team discretion in LOG*.	Proportion in teams interacted with dummy for “team members jointly decide how work is done”	0.322	0.296
Flexitime	No set start or finish time but total hours set	0.391	0.333
Flexible shifts	Ability to shift patterns	0.556	0.396
Compressed-hours working	e.g. 9-day fortnights	0.211	0.096
Annualised hours job	Any annualised hours arrangements in workplace	0.112	0.026
Zero hours work	Any zero hours arrangements in workplace	0.086	0.038
Monitoring by Manager/Supervisor	How work quality is monitored.	0.866	0.818
Monitoring by Inspector(s)	“ “	0.397	0.229
Monitoring by Records of Faults	“ “	0.634	0.424
Monitoring by Customer Surveys	“ “	0.563	0.364
No Targets	None of 11 possible targets	0.120	0.246
25 or more employees	Size of workplace	0.721	0.207
Trade Union Member		0.218	
Establishment Union Density (%)			8.306
Age		38.8	
Age Squared		1671.4	
Male		0.498	
White		0.937	

*Largest occupational group in establishment.

[1] This dilemma (and associated class conflict) did not, of course, originate in the current era (Braverman, 1974). However, a central tenet of the post-Fordist theory of production is that the *predominant* technologies became more flexible and uncertain than in the Fordist era (Piore and Sabel, 1984).

This change radically altered the trade-off between control and delegation of autonomy, so that the granting of autonomy was to become no longer the exception, a privilege attained mainly by professional workers and a managerial elite; rather, the ideal was one of flattened hierarchies and devolved control.

[2] In certain strands of sociological theory, skill is defined as constituted partly by autonomy, and partly by job complexity. See Spenner (1990) for a methodological review.

[3] Both academic and popular management theorists urge employers to harness this commitment (e.g. Walton, 1985; Peters, 1992). The net effect on output and labour turnover of firm-specific utility is the same as that of firm-specific human capital, the only difference being that commitment affects effort while firm-specific human capital is normally conceived as raising output per unit of effort.

[4] High-skilled professional occupations (e.g. doctors and academics) typically advocate their own autonomy, referring to its productive value for their employers. The potential downside of such autonomy normally has to be pointed out by others.

[5] The alternative in this context might be to link performance with pay, if suitable instruments are available to employers to measure performance; but to keep things simple I have abstracted from other forms of motivation

[6] This restriction follows from the paper's focus on organisational commitment, in respect of which respondents are questioned about the loyalty to the organisation they work for. The potential ambiguity as to what is meant by the organisation they work for is of possible concern in the case of public sector workers.

[7]

[8] In a multi-variate analysis, including all variables normally included in such an analysis, discretion was also by far the most important variable to have an association with job satisfaction.

[9] The full Organizational Commitment Questionnaire, which is a 15-item scale, correlates highly with the Affective Commitment Scale (Allen and Meyer, 1990).

[10] The weights do not account for the possibility that the propensity to participate in the survey is related in unknown ways to workplace discretion.

[11] The 2006 Skills Survey, now in the field, will afford an opportunity for a comprehensive confirmation or refutation of this finding.

[12] As an alternative I inputted this variable as four dummy variables. In an OLS regregression discretion rose monotonically across commitment levels. For the analysis shown here, however, a simple commitment variable ranging from 1 to 5 is entered directly, in order to faclitate computation of the IV estimates in column (2).

[13] It is possible that managers who report that teams allow workers to jointly decide about work tasks may have an upward biased view of the amount of individual discretion that workers have, or that they might conflate individual and team discretion.

[14] These latter alternative specifications are not reproduced in full here, to save space, but are available on request to the author.