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Performance pay, sorting and the dimensions of job satisfaction

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Performance Pay, Sorting and the Dimensions of Job Satisfaction

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Abstract

This paper investigates the influence of performance related pay on several dimensions of job satisfaction. In cross-sectional estimates, performance related pay is associated with increased overall satisfaction, satisfaction with pay, satisfaction with job security and satisfaction with hours. It appears to be negatively associated with satisfaction with the work itself. Yet, after accounting for worker fixed-effects, the positive associations remain and the negative association vanishes. These results appear robust to a variety of alternative specifications and support the notion that performance pay allows increased opportunities for worker optimization and do not generally demotivate workers or crowd out intrinsic motivation.

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INTRODUCTION

The use of performance pay schemes by employers has been shown to increase worker productivity, effort and increase worker earnings (Lazear, 2000, Paarsch & Shearer 2000, Parent 1999). However, it remains unclear *a priori* what effect performance pay schemes have on worker satisfaction with the job. While increased earnings will increase worker satisfaction, other aspects of performance pay schemes may have less beneficial effects on job satisfaction. Pay schemes based on performance may introduce large variations in periodic earnings reducing the utility of risk averse workers. The performance monitoring associated with pay schemes may result in increased effort that workers dislike. While some types of performance pay (such as profit sharing) may increase job security, others will increase earnings dispersion within the firm and may reduce perceptions of fairness or lower morale and motivation. In this way, performance pay schemes may increase worker satisfaction with pay, while reducing their satisfaction with other dimensions of the job such as effort, risk or perceived fairness.

This paper presents evidence on the impact of performance pay schemes on job satisfaction in the United Kingdom. Specifically, we use the British Household Panel Survey (BHPS) to investigate the impact of profit sharing, bonuses and performance pay on several dimensions of job satisfaction, including overall satisfaction, satisfaction with pay, with hours, with job security and with the work itself. The paper provides the first evidence of the influence of performance pay schemes on many of these different aspects of job satisfaction. In traditional cross-section estimates, we demonstrate that performance related pay schemes are positively related to satisfaction with pay, to satisfaction with job security and to a lesser extent with satisfaction with hours and overall satisfaction. Performance related pay schemes appear negatively related to satisfaction with the work itself. Next, we utilize the panel nature of the

BHPS and demonstrate that controlling for individual fixed effects confirms the positive influences of performance pay. Including the fixed effects, profit sharing and/or performance pay remain associated with higher satisfaction overall, with pay, with job security and with hours. The negative influence on satisfaction with the work itself vanishes in the fixed effect estimates. A series of robustness checks confirm these general patterns but show that results vary by gender and by union status.

The paper is structured as follows. The next section provides an overview of evidence on the effect of payment schemes on worker outcomes with specific attention to job satisfaction. Section II describes the data source and empirical methodology. Section IV presents the central econometric results contrasting the cross section and fixed-effect estimates. Section V describes robustness checks and presents results within several subsamples. The final section concludes.

I. PAST THEORY AND EVIDENCE

Payment schemes are seen as more closely aligning the interests of workers and firms. The critical characteristic of linking effort and pay allows a more complete optimisation by workers than is possible with time rates (Heywood and Wei 2006). In the extreme, workers paid piece rates or commissions equate the marginal cost of effort with the marginal value added (See Lazear, 1995). The infra-marginal effort brought forth by the piece rate generates worker earnings above the cost of effort. While this generates the maximum surplus for workers, workers paid time rates stop short of the optimal effort, failing to produce units that generate value added greater than effort. Thus, many studies confirm that those on piece rates increase effort and earn more than otherwise equivalent workers on time rates (Ewing, 1996; Lazear 2000; Oettinger, 2001; Parent 1999).[1] The ability to more fully optimise should make workers more satisfied, all else equal.

Yet, all else may not be equal. Some factors may further increase the satisfaction associated with performance pay. Brown and Sessions (2003) suggest that workers prefer employment environments seen as rewarding their productivity and that such environments increase worker optimism about future employment. In addition, some types of performance pay may be part of a bundle of HRM innovations associated with high performance workplaces. Such workplaces may create greater feelings of belonging, esteem and commitment. Goddard (2001) and Baurer (2004) present evidence on the association between job satisfaction and high performance workplaces.

There exist a number of reasons, however, why performance related pay may reduce job satisfaction. First, performance pay may not be successful. Evaluations may be overly subjective or objective measures of performance may be poorly tied to actual firm profit. In theses cases, overall surplus may not be increased as workers try to maximize an objective such as the favour of their supervisor or the number of pieces produced (Baker 1992). In this second case, workers may increase productivity in response to piece rates but not increase profitability as, for instance, quality falls, maintenance deteriorates, or injuries increase (Freeman and Kleiner 2005). Similarly, schemes that rely on a supervisor's evaluation are known to suffer from a variety of biases that may cause them to fail to increase surplus (Prendergast 1999). Some schemes have also been shown to undermine valuable teamwork and cooperation (Drago and Garvey 1998). Schemes with such malfunctioning characteristics might well be anticipated to lower worker satisfaction.

Second, Gibbons (1987) formalized the traditional union fear that 'ratcheting' would lower rewards and incentives after workers respond with additional effort. Certainly Green (2004) has shown that the use of performance pay is associated with work intensification in Britain. Case

studies of call centres by Drago (1996) and Fernie and Metcalf (1999) present bleak pictures of low wages and high stress made worse by computerized monitoring and piece rates. Thus, performance pay may be merely a disciplinary tool that doesn't allow greater optimisation but merely increases work effort and lowers satisfaction especially for the low skilled (For more on the consequences for the low skilled see McCausland et al. 2005). Even group schemes and profit sharing designed to change workplace norms may increase not only effort and earnings but also peer-pressure. Kandel and Lazear (1992) emphasize that this peer-pressure can be so severe as to actually lower worker utility (job satisfaction) even as earnings rise.

Third, workers may suffer reduced satisfaction from the increased earnings risk associated with performance pay schemes that may not be fully built into compensating wage demands (Milgrom and Roberts 1992). Moreover, typical job satisfaction estimates hold constant earnings suggesting that the direct negative effect of the earnings risk may be reflected in lower satisfaction. Yet, the role of sorting by risk can be critical. Sliwka and Grund (2006) have shown that workers who have a greater tolerance for risk are significantly more likely to choose jobs receiving performance pay. Thus, the fact that performance pay is associated with greater earnings risk need not imply that the workers receiving performance pay are less satisfied with their earnings risk. Moreover, a counterbalance to this increased risk occurs when the variation in workers payments matches that of firm performance. Thus, profit sharing has been recognized as increasing the job security of workers because worker payments fall during times of low profitability, which reduces the chance of layoff (see Wetizman 1984 and Kruse 1993). Thus, profit sharing may simultaneously increase earnings risk but reduce the likelihood of job loss.

Fourth, greater pay dispersion typically results from individual performance pay schemes and Kennedy (1995) shows that such schemes reduce the morale of the least productive workers

and reduce their effort (productivity). Indeed, his model shows that this effect can be sufficient to overwhelm the effort increase among the most productive and actually lower average productivity compared with using time rates. In studying the implementation of performance pay Marsden et al. (2001) show statistical evidence of just such reductions in productivity among those with low performance pay increments. This they say is combined with the "demotivating effect arising from difficulties of measuring and evaluating performance fairly." Personnel management texts routinely stress that avoiding excessively inequitable pay rates is important in creating harmony and productivity (see the studies cited in Akerlof and Yellen, 1988). Brown (2001) demonstrates that workers who believe their payment methods are 'fair' report higher satisfaction with their pay. Thus, regardless of the influence on total surplus, it is possible that some types of performance pay will be perceived as unfair reducing job satisfaction.

Finally, Frey and Jegen (2001) review the literature showing that extrinsic incentives such as performance pay can crowd out intrinsic motivation to do a good job. Again, they claim this crowding effect can actually dominate the traditional effect resulting in lower utility and productivity. Even if it does not dominate the traditional effect, it may show up in reduced satisfaction with intrinsic aspects of the job such as satisfaction with the job itself. Thus, the influence of performance pay on job satisfaction cannot be determined by theory. To the extent that it allows better optimisation and an increase in surplus it should increase satisfaction. Yet, influences on risk, effort, morale and intrinsic satisfaction could reverse this suggestion. Understanding the net influence of performance pay on job satisfaction remains important as job satisfaction has been shown to be closely correlated with both worker effort and with the intention to quit (Clark 2001).

Two papers directly estimate the impact of performance pay schemes on over all job satisfaction. McCausland et al. (2005) use waves 8 – 11 of the BHPS to contrast the pay satisfaction of those receiving performance pay compared to those not receiving performance pay. They use an econometric framework that endogenizes wages and accounts for self-selection into method of pay. They show that for more highly paid workers satisfaction with the job and with pay both are higher under performance pay. On the other hand, for lower paid workers satisfaction is lower under performance pay. They suggest that the difference between the two groups of workers may result if lower paid workers are more likely to see performance pay as a form of monitoring or control. While this certainly follows, it may also be the result of the demotivation of lower ability workers modelled by Kennedy (1995) and observed by Marsden et al (2001).

Two additional points deserve notice. First, that the definition of performance pay adopted by McCausland et al. (2005) does not include profit sharing. Indeed, because profit sharing is asked as a separate question on payment method in the BHPS, estimating the determinants of performance related pay versus all other methods would include profit sharing among the base group of other methods. If some of the influences of profit sharing and other performance related pay are similar, they could be obscured as a consequence. Second, while the BHPS examined fewer dimensions of job satisfaction by wave 8, it continues to examine several beyond overall job satisfaction and satisfaction with pay.[2] While not the focus of the study by McCausland et al, using these dimensions might help examine some of the conflicting theories described above. For instance, satisfaction with job security might be useful in unravelling the role of performance pay on risk and so on satisfaction.

Heywood and Wei (2006) use the National Longitudinal Study of Youth to examine the influence of both profit sharing and individual performance pay in the United States. They show that both profit sharing and individual performance pay are associated with greater job satisfaction and greater satisfaction with pay. Profit sharing is also associated with greater satisfaction with the worker's supervisor. Interestingly, within the measure of individual performance pay there is a suggestion that piece rates may reduce overall satisfaction even as it increases satisfaction with pay. Neither the broad measure of individual performance pay nor profit sharing were correlated with satisfaction with co-workers although studies of German workers (Heywood et al 2005a, 2005b) show that profit sharing tends to positively influence satisfaction with both supervisors and with co-workers. While these studies control for earnings, they do not try to correct for selection.

In what follows, we return to the BHPS to examine the determinants of job satisfaction. We examine those determinants for all of the dimensions of job satisfaction available in the data and simultaneously examine the influence of both performance pay and profit sharing.

II. DATA AND METHODOLOGY

The data used in this paper is drawn from the British Household Panel Survey (BHPS). The BHPS is a nationally representative sample that each year interviews approximately 10,000 individuals from roughly 5,500 households (McCausland et al 2005). We use the waves of the BHPS corresponding to 1998-2004, as earlier waves do not contain information on pay schemes. We restrict our sample to those individuals aged 20 to 65 and who are employees. This yields an unbalanced panel of 11,849 individuals.

The information on payment schemes in the BHPS is available for 1998 onwards and the questions asked are, "have you received any bonuses such as a Christmas or quarterly bonus, profit-related pay or profit sharing bonus, or an occasional commission?", this excludes overtime payments; and "Does your pay include performance related pay" (Taylor et al, 2006). From these two questions, we create three mutually exclusive variables, the individual received profit shares/bonuses only, the individual received performance related pay only or the individual received both profit shares/bonuses and performance pay. Our data does not identify the proportion of earnings attributable to different pay schemes, a limitation shared with most individual and establishment data sets (see Heywood et al, 1998).

INSERT TABLE 1

All job satisfaction questions in the BHPS are reported on a 7 value Likert scale, 1 being the least satisfied, 7 the most satisfied. At different times a variety of job satisfaction questions have been included in the BHPS but for the period in which pay scheme information is available, five job satisfaction questions are available. These include overall job satisfaction, satisfaction with pay, satisfaction with hours worked, satisfaction with job security, and satisfaction with the work itself. Table 1 provides mean job satisfaction levels for these five categories, disaggregated by the type of pay scheme. For brevity and to avoid double counting individuals, we report these for the 1998 sample only.[3]

Overall job satisfaction is highest for those who do not receive any form of performance pay or profit sharing/bonuses and next highest for those who receive profit sharing or bonuses only. Satisfaction with pay is the highest and nearly identical for those both receiving profit sharing/bonuses only and those receiving these in conjunction with performance pay. Performance pay only appears to be associated with lower levels of satisfaction with security. In

general, the pattern of unconditional means reported in Table 1 does not appear to support a strong link between job satisfaction and performance pay schemes.

INSERT TABLE 2

Table 2 presents the correlations between the five measures of job satisfaction. While the correlations between overall job satisfaction and the other dimensions are reasonably large, the correlations among those other dimensions are sufficiently small to indicate that they measure different aspects of satisfaction. Thus it makes sense from a statistical, as well as a theoretical, point of view to separately estimate the determinants of the individual dimensions.[4]

A number of variables are available in the BHPS that allow us to control for other sources of variation in work conditions, many of which we would expect to influence job satisfaction. Thus, we observe the workers pay rate (log pay), the number of hours worked and whether they worked overtime. When estimating the impact of performance pay schemes on job satisfaction it is important to control for these factors as, from the discussion in the previous section, we would expect these to vary with pay scheme. Other included variables related to job characteristics are whether the individual had a work pension, whether the employer provided health insurance, whether the employer provided training, whether the individual was promoted in the last year, are they on a temporary contract, do they have a management or supervisory role, and size of the firm.

INSERT TABLE 3

Table 3 presents sample means and standard deviations of the independent variables. The variables included are largely standard in the literature on job satisfaction. Again for brevity, sample means for the first wave used (1998) are presented, full pooled (i.e. multiple individual-time observations) sample means are presented in the appendix as table A2. The variables include

the controls for work conditions listed above along with gender, whether the respondent is in a union and whether the respondent has a disability. Also included, but not reported in the sample means, are 10 controls for industry, 9 controls for occupation and 11 controls for region.

Following past research, the values of job satisfaction are fitted to the cumulative normal distribution through ordered probit estimates (see Clark and Oswald, 1996 and Clark et al 1997 among others). The ordered probit estimation follows appropriately when the dependent variable has a natural ordering, such as least to most satisfied (see McKelvey and Zavonia 1975).

III. CENTRAL RESULTS

INSERT TABLE 4

Table 4 presents estimates of job satisfaction using data pooled for 1998-2004, with standard errors clustered at the individual level. Column 2 provides estimates for overall job satisfaction. Estimates for controls are largely as demonstrated in previous research. Job satisfaction declines with education level and firm size. Union members are less satisfied, while public sector workers are more satisfied with their job. Females appear to have markedly higher job satisfaction than males confirming past findings of the "paradox of the contented female worker."

In terms of performance pay measures, only those receiving profit sharing or bonuses only have a significantly higher level of overall job satisfaction. Columns 3 to 6, display covariate estimates for the various dimensions of job satisfaction reported in the BHPS for 1998 to 2004. As might be expected performance pay measures are associated with increases in worker's satisfaction with their pay. As we control for the level of pay, this result goes beyond the recognized influence that performance pay has in increasing earnings and is consistent with

an improved ability to more nearly optimize the trade-off of effort and earnings. There is also an indication that profit sharing or bonuses are associated with higher levels of satisfaction with work hours. Again, work hours are accounted for and as anticipated workers have lower satisfaction with their hours of work when those hours are greater. The point is that holding the hours of work constant those who receive profit shares or bonuses report greater satisfaction with their hours. Taken together, these two results do suggest that profit sharing or bonus schemes allow workers to choose effort and pay combinations more in line with their preferences and so generate greater job satisfaction.

We suggested conflicting theoretical influences upon satisfaction with job security. Profit sharing has been recognized to create greater job security by reducing marginal costs of employment when profits are low. This seems born out by the highly significant and large influence of profit sharing on greater job satisfaction with security. The influence of performance pay is less clear. An emphasis on output-based measures might imply a greater chance of being fired based on under-performance. On the other hand, the ability to avoid being fired may more nearly be in the hands of workers who can influence their output. Importantly, we also know that workers with less aversion to risk sort into jobs with performance related pay. Column 6 shows that performance related pay is associated with greater satisfaction with job security, albeit only statistically significant at the 10 percent level.

Finally, there appears to be a weakly significant negative effect of performance pay on satisfaction with the job itself. As this estimate also holds constant pay, it may reflect the tendency of performance pay schemes to crowd out intrinsic satisfaction. Alternatively, it may reflect the tendency for jobs that are easily monitored and paid by performance to be simple and repetitive (MacLeod and Parent 1999). Nonetheless, this one result does not change the overall

pattern that performance pay and profit sharing tend to have positive influences across a variety of dimensions of job satisfaction.

INSERT TABLE 5

Not only do the performance pay variables generate a series of statistically significant coefficients but the magnitudes of the effects are also important. In Table 5 the marginal effects on the probability of reporting the highest level of satisfaction are reported for each of dimensions of job satisfaction.[5] Thus, the first entry indicates that receiving only profit sharing/bonuses increases the likelihood of being in the most satisfied category by one percentage point. This is not a small effect as the mean level is around 11 percent. Thus, a one percentage point increase represents an increase of $1/11^{th}$ relative to the mean or a finding that those receiving profit sharing/bonuses are 9 percent more likely to report being in the most satisfied category. The magnitudes for the other payment schemes and dimensions vary but are largest for pay and for job security.

The estimates presented so far have assumed that individuals are randomly assigned into different pay schemes. There is evidence, however, that this is not the case (McCausland et al 2005). Lazear (2000) suggests that 56 percent of the increase in productivity associated with one form of performance related pay, piece rates, is associated with the sorting of inherently more productive workers into firms operating these type of pay schemes. In the context of this paper, this is important insofar as any estimated effect of performance related pay on job satisfaction may merely reflect the sorting of workers with preferences for performance related pay to these type of jobs. In particular, if more productive workers are more satisfied under any pay setting but are attracted to performance pay settings as Lazear suggests than the apparent influence of performance pay on satisfaction would be misleading.

The suggestion that fixed effects can be critical in estimating job satisfaction has been confirmed by Heywood et al (2002) who showed that the dissatisfaction of union workers with their pay in a cross-section is eliminated in fixed-effect estimates that concentrate on workers changing union status. Such fixed effects may also influence the cross-sectional estimates for the facets reported in Table 3. Thus, fixed effects will largely hold constant risk aversion allowing the actual role of performance pay on satisfaction with security to emerge. Similarly, the unmeasured skills of workers limited to routine and easily monitored jobs can be held constant to focus on the actual role of performance pay on satisfaction with the job itself. In essence, the panel estimates remove the role of sorting by unmeasured worker fixed effects.

To control for unobserved worker specific effects on job satisfaction we estimate fixed-effects ordered probits using the within worker variation across the 7 waves.[6] The specification used in Table 4 is again used but obviously time invariant worker characteristics (such as gender) will necessarily be omitted from the estimation.

INSERT TABLE 6

Table 6 provides the fixed effects estimates of job satisfaction. They generally support the earlier estimates and for brevity only the coefficients for the pay scheme type are reported. Column 2 confirms the earlier reported significant positive effect of profit sharing/bonuses on overall job satisfaction. Moreover, all three of the indicators of payment schemes remain positive and significant indicators of satisfaction with pay and satisfaction with job security as they did in the cross-section. Thus, risk sorting does not appear to be driving the job security results in the cross-section. In the cross-sectional estimates both performance pay and profit sharing/bonuses positively influenced satisfaction with hours. Controlling for individual fixed effects, they remain positive but now it is the coefficient on performance pay schemes that reaches statistical

significance. The previously negative influence of performance pay on satisfaction with the work itself is not apparent in the fixed effects estimate. Such a pattern is consistent with the conjecture that workers who are subject to certain types of performance pay (such as piece rates) may be limited to jobs that tend to be more repetitive and simple and that once these fixed effects are held constant, the nature of the payment schemes does not play an independent role.

In total, these results suggest two specific points. First, performance related pay schemes are significant determinants of several different aspects of job satisfaction. Second, estimates of the influence of pay schemes on job satisfaction which fail to control for individual specific effects may misrepresent the influence on a number of these aspects.

More generally, the results provide no evidence that performance pay schemes demotivate workers, lower morale or crowd out intrinsic motivation. While these things may happen in specific cases, they are certainly not sufficiently general to lower any of the dimensions of job satisfaction. Instead, the bulk of the evidence would be consistent with performance pay improving opportunities to optimise effort and reward trade-offs, improving senses of fairness in rewards or the efficacy of effort and improving job security. In this sense, the results provide important corroboration of those of Heywood and Wei (2006) and of McCausland et al. (2005) who found important positive effects of performance pay on satisfaction but found them for more general measures of satisfaction (fewer dimensions) and for more limited samples (only the more highly paid).

IV. ROBUSTNESS CHECKS AND SUBSAMPLE RESULTS

Before moving on to specific checks and subsamples, we emphasize a general result. All of the estimates of the influence of performance related pay schemes on all dimensions of job

satisfaction are robust to the exclusion of controls for hours worked (and overtime) and pay. While hours itself often matters for satisfaction, it does not interact with performance related pay in a fashion that alters the results reported in the previous section. This invariance goes, in part, to the issue of whether longer hours are associated with payment schemes and so might lower satisfaction. We found no evidence of such a suggestion. Performance related pay is known to increase earnings and one might argue that this influence should not be held constant in examining the influence of performance related pay on satisfaction. Indeed, the size and significance of the coefficients remain at least as large excluding earnings as a determinant of satisfaction.

McCausland et al (2005) claim that for lower paid workers performance pay schemes merely act as a discipline and monitoring device, and as a result performance pay reduces job satisfaction for this group. We examine this contention by splitting the sample according to wage. Specifically, we stratify the sample by whether the worker was above or below the median wage in the sample for each year. We then estimate fixed effects models of all dimensions of job satisfaction for the lower income panel. These estimates (available upon request) indicate that pay schemes have no significant impact on overall job satisfaction for these workers. Despite the reduced sample size, all three categories of pay schemes remain associated with increased job satisfaction with pay (even holding pay constant in the estimates). Moreover, profit sharing remains associated with significantly increased satisfaction with job security. Interestingly, profit sharing is associated with significantly reduced satisfaction with the job itself. This is surprising as one might anticipate this to come from the higher-powered performance pay schemes and may flow from the class of jobs in which profit sharing is offered to lower paid workers. In total, these

results are not suggestive of overall negative effects on morale or motivation of performance related pay schemes for low paid workers.

A further factor to consider when examining the role of performance related pay schemes on satisfaction with hours worked is that this may vary markedly by worker's skill level. For instance, Drago (1996) and Fernie and Metcalf (1999) illustrate the negative effect of piece rates on worker morale in call centres. We examine such claims by estimating the model for satisfaction with hours worked separately for low skill workers. There are two main ways one might think of identifying low skill workers in our data. First, we could focus on workers with low education levels. Estimates based on samples of workers without a-levels (n=22,047), or workers without post-school qualifications (n=31,451) reveal no systematic effect of performance pay schemes on satisfaction with hours worked. Second, we look at workers in low-skill occupations by identifying workers in the three lowest skilled occupational groups (sales and customer service occupations; process, plant and machine operatives; and elementary occupations). Again estimates based on this sample (n=8864) show no statistically significant relationship between satisfaction with hours and performance related pay schemes.

INSERT TABLE 7

In light of the large variations in job satisfaction by both gender and union status displayed in Table 4, it is worth considering whether there are variations in the impact of performance related pay on job satisfaction across both these groups. Table 7 provides estimates of the impact of performance related pay on job satisfaction split by gender and union membership, respectively. In both cases all controls are as Table 4 and in addition controls for individual fixed effects are included.

The results stratified by gender reveal a few differences. First, profit sharing increases job satisfaction for men, but not women. Performance pay has a positive effect on job satisfaction with hours, pay and job security for men, but only the pay effect is apparent for women. Profit sharing increases satisfaction with pay and job security for men, but only job security for women. Together these results suggest that performance related pay schemes are more beneficial for men. To the extent that such schemes create increased competition and rivalry within the workplace, this might be anticipated based on several experiments showing that competition improves the performance of males but not of females (Gneezy and Rustichini 2004).

The results in the second panel demonstrate that there are marked differences between union and non-union workers in terms of the effect of performance related pay schemes on job satisfaction. For instance, profit sharing increases the latent measure of overall job satisfaction by almost 0.13 for union workers, while receiving both profit shares and performance pay increases the latent measure of job satisfaction by 0.12. For non-union workers no such effects are noticeable, while only performance pay increases their overall job satisfaction. Performance related pay schemes increase satisfaction with pay for both groups, but the magnitude of the effect is much larger for union workers who receive only performance pay or in conjunction with profit sharing. Performance pay increases satisfaction with hours for unionized workers, while profit shares increase satisfaction with security for non-union workers.

The remarkably strong role for performance pay among unionized workers may at first blush seem surprising. Unions are presumed to oppose individual performance pay because it hurts the solidarity wage and increases earnings dispersion among workers doing the same job (Issac 2001). At the same time, unions are presumed to oppose explicit profit sharing as it replaces the implicit profit sharing that takes place during bargaining (Drago and Heywood

1995). Yet, the international evidence on the association between unions and performance pay is best described as inconclusive. Moreover, US and Canadian evidence suggests that when unions are involved in the creation and implementation of performance pay schemes, the schemes are associated with better firm performance and greater longevity (Kim and Voos 1997; Kim 1999). German evidence makes clear that active involvement by organized labor (in the form of works councils) actually increases the chance of a firm adopting performance pay (Heywood et al. 1998). Thus, the finding that performance pay is associated with increased job satisfaction for union members may not be paradoxical if the schemes in the union sector are more likely to be both accepted by workers and successful because of their role in its creation.

V. CONCLUSION

This paper aimed to estimate the impact of performance pay schemes on a number of dimensions of job satisfaction. We have provided evidence that profit sharing/bonuses tend to increase overall job satisfaction. Overall, performance related pay increases satisfaction with both pay and job security. The latter finding is not necessarily intuitive. Performance related pay may decrease job security insofar as it is indicative of a culture of monitoring of work effort. Conversely, linking pay to productivity may increase job security as wages fluctuate positively with the output of the firm (Weitzman 1984, Kruse 1993), reducing the need for firms to lay-off workers in periods of weak product demand. It may also attract workers who are willing to tolerate risk and so are no less likely to be satisfied with their degree of security. Our findings suggest that the latter two suggestions dominate.

A concern with performance related pay is that it can lead to work intensification (Green 2004), and in turn this may lead to dissatisfaction with hours worked. In this study we find no

evidence of performance related pay adversely affecting satisfaction with hours worked, even for low skilled workers whom it has been suggested are adversely affected by performance pay schemes. Indeed, in the fixed effect estimates we found evidence of greater satisfaction with hours among those receiving performance pay.

A related concern is that the explicit incentives of performance related pay may crowd out intrinsic motivations. In the cross section estimates there was, indeed, a suggestion that performance related pay was associated with reduced satisfaction with the job itself. Yet, the fixed effects estimates revealed this was the result of sorting as the association did not persist. Thus, we remain unable to confirm any negative influences of performance pay on job satisfaction and unable to dislodge a series of positive influences.

Several caveats also remain. First, these general tendencies do not mean that the job satisfaction of all workers will increase should their firm adopt performance pay. By its nature performance pay is suited for some types of production technologies and not suited for others. Thus, we emphasized in our early discussion that performance pay can, in some circumstances, be counter-productive and decrease surplus (Freeman and Kleiner 2005). It makes sense that workers in such cases may not have increased satisfaction. Second, other dimensions of job satisfaction may still present negative correlations. Satisfaction with management, coworkers or stress may all be lowered by performance pay. We simply don't have access to those dimensions in our data. Finally, we recognize that our measures of performance pay may aggregate individual practices that have off setting influences. Thus, piece rates may lower satisfaction even as earnings based on a broader formal appraisal increase satisfaction. We cannot identify whether or not such differences exist. Despite these caveats, the many suggestions that worker welfare will be reduced by performance pay have received no support in our inquiry.

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TABLE 1 Summary Statistics, Pay Scheme and Job Satisfaction, Employees Age 20-65, 1998

	Overall	Pay	Hours	Security	Work Itself
Base (2569)	5.33	4.88	5.17	5.36	5.43
Profit Sharing/Bonuses Only (996)	5.31	5.02	5.08	5.48	5.38
Performance Pay Only (332)	5.21	4.89	5.26	5.19	5.37
Profit Sharing/Bonuses and Performance Pay (502)	5.20	5.03	5.00	5.35	5.23
Individuals	4,399				

Source: British Household Panel Survey (BHPS), 1998. Job satisfaction reported on 1-7 Likert scale.

TABLE 2 Correlations Between Different Dimensions of Job Satisfaction, 1998-2004.

	Overall	Hours	Pay	Work Itself
Overall				
Hours	0.511			
Pay	0.483	0.345		
Work Itself	0.701	0.430	0.340	
Job Security	0.423	0.251	0.292	0.295

Source: BHPS.

TABLE 3 Summary Statistics, Employees Aged 20-65, 1998.

Variables	Mean	Std Dev
Profit Sharing/Bonuses Only	0.226	
Performance Pay Only	0.075	
Profit Sharing/Bonuses and Performance Pay	0.114	
Male	0.511	
Age (years)	38.060	10.981
Tenure	12.179	7.845
Married	0.582	
Highest Level of Education:		
< A-Level	0.541	
A-Level	0.216	
Diploma	0.085	
Degree	0.129	
Higher Degree	0.029	
Log Pay	6.174	0.990
Normal Hours Worked	35.907	9.327
Union Member	0.319	
Public Sector Worker	0.303	
Temporary Job	0.050	
Manager/Supervisor	0.394	
Promoted in Last Year	0.075	
Pension	0.553	
Employer Provided Health Insurance	0.104	
Employer Provided Training	0.210	
Firm Size: 1-24 workers	0.320	
25-99 workers	0.264	
100-499 workers	0.247	
500 workers plus	0.169	
Observations	4,399	

Source: BHPS

TABLE 4 Dimensions of Job Satisfaction, Covariate Estimates 1998-2004.

	Overall	Hours	Pay	Work Itself	Job Security
Profit Sharing/Bonuses Only	0.053*	0.030***	0.095*	-0.011	0.115*
	(0.017)	(0.016)	(0.017)	(0.016)	(0.017)
Performance Pay Only	-0.0003	0.021	0.071*	-0.043***	0.042***
	(0.023)	(0.024)	(0.025)	(0.024)	(0.025)
Profit Sharing/Bonuses and Performance Pay	-0.0002	-0.017	0.098*	-0.024	0.042***
	(0.023)	(0.023)	(0.022)	(0.024)	(0.024)
Male	-0.133*	0.050**	-0.094*	-0.092*	-0.123*
	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)
Age	-0.020*	-0.028*	0.007	-0.013**	-0.050*
	(0.006)	(0.005)	(0.006)	(0.006)	(0.006)
Age Sqr	0.0003*	0.0003*	-0.00004	0.0002*	0.001*
	(0.00007)	(0.00007)	(0.00007)	(0.00007)	(0.00007)
Tenure	-0.001	-0.001	0.002*	-0.001***	0.0001
	(0.0007)	(0.001)	(0.001)	(0.0007)	(0.001)
Married	0.097*	0.003	0.099*	0.088*	0.060*
	(0.017)	(0.017)	(0.018)	(0.018)	(0.017)
A-Level	-0.093*	-0.055**	-0.006	-0.082*	-0.058**
	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)
Diploma	-0.100*	-0.113*	0.035	-0.098*	-0.053
	(0.039)	(0.037)	(0.038)	(0.036)	(0.036)
Degree	-0.123*	-0.147*	0.095**	-0.161*	0.033
	(0.039)	(0.040)	(0.040)	(0.038)	(0.040)
Higher Degree	-0.125*	-0.168*	0.129**	-0.161*	0.042
	(0.054)	(0.054)	(0.058)	(0.055)	(0.057)
Log Pay	0.041*	0.046*	0.154*	0.033*	0.011
	(0.010)	(0.010)	(0.011)	(0.011)	(0.010)
Normal Hours Worked	-0.005**	-0.026*	-0.003	-0.002	0.003
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Overtime Hours	0.0003	-0.033*	0.0001	0.007*	0.006*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Union Member	-0.123*	-0.073*	-0.044**	-0.146*	-0.071*
	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)
Public Sector Worker	0.126*	0.085*	0.045***	0.087*	0.266*
	(0.022)	(0.022)	(0.025)	(0.022)	(0.022)
Temporary Job	-0.231*	-0.054	-0.004	-0.042	-1.288*
	(0.038)	(0.034)	(0.040)	(0.038)	(0.041)
Manager/Supervisor	0.055*	-0.046**	0.108*	0.051**	0.148*
	(0.022)	(0.022)	(0.022)	(0.021)	(0.022)
Promoted in Last Year	0.167*	0.105*	0.102*	0.148*	0.131*
	(0.021)	(0.021)	(0.021)	(0.021)	(0.022)
Pension	-0.001	0.005	0.034**	-0.031***	0.025
	(0.018)	(0.017)	(0.018)	(0.018)	(0.018)
Employer Provided Health	0.047***	0.016	0.170*	0.001	-0.057**
	(0.026)	(0.026)	(0.027)	(0.027)	(0.026)

Insurance					
Employer Provided Training	0.070*	0.046*	-0.015	0.083*	0.028***
	(0.015)	(0.014)	(0.015)	(0.015)	(0.015)
25-99 workers	-0.073*	-0.051*	-0.051*	-0.114*	-0.038**
	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)
100-499 workers	-0.123*	-0.034	-0.042***	-0.182*	-0.048**
	(0.023)	(0.024)	(0.025)	(0.025)	(0.023)
500 workers plus	-0.108*	-0.038	-0.022	-0.196*	-0.038
	(0.028)	(0.029)	(0.027)	(0.028)	(0.028)
Comparison Wage	-0.143**	-0.025	-0.307*	-0.041	-0.189*
	(0.064)	(0.068)	(0.068)	(0.062)	(0.061)
Pseudo r^2	0.02	0.04	0.01	0.02	0.03
Observations	43,215				

*, **, *** indicate statistical significance at 1%, 5% and 10%, respectively. Numbers in parentheses are standard errors clustered at the individual level.

TABLE 5 Marginal Effects on the Probability of Being in the Most Satisfied Category, 1998-2004.

	Overall	Hours	Pay	Work Itself	Job Security
Profit Sharing/Bonuses Only	0.010* (0.003)	0.006*** (0.003)	0.015* (0.003)	-0.003 (0.004)	0.035* (0.005)
Performance Pay Only	-0.00006 (0.004)	0.004 (0.005)	0.011* (0.004)	-0.010*** (0.006)	0.013*** (0.008)
Profit Sharing/Bonuses and Performance Pay	-0.00004 (0.004)	-0.004 (0.005)	0.015* (0.004)	-0.006 (0.005)	0.013*** (0.007)
Proportion of Sample in Most Satisfied Category	0.114	0.140	0.085	0.159	0.231

*, **, *** indicate statistical significance at 1%, 5% and 10%, respectively.

Numbers in parentheses are standard errors clustered at the individual level.

TABLE 6 Performance Related Pay and Job Satisfaction, Fixed Effects Estimates 1998-2004.

	Overall	Hours	Pay	Work Itself	Job Security
Profit Sharing/Bonuses Only	0.047**	0.017	0.097*	-0.027	0.106*
	(0.021)	(0.020)	(0.021)	(0.021)	(0.021)
Performance Pay Only	0.051	0.073**	0.161*	0.045	0.099*
	(0.032)	(0.031)	(0.031)	(0.031)	(0.032)
Profit Sharing/Bonuses and Performance Pay	0.005	-0.031	0.123*	-0.030	0.134*
	(0.030)	(0.029)	(0.029)	(0.030)	(0.030)
Observations	43,215				
Log Likelihood	-44278.33	-49205.32	-50139.67	-45555.64	-47202.85

*, **, *** indicate statistical significance at 1%, 5% and 10%, respectively.

The specification includes all variables that show change for individuals across the waves. Standard errors are in parentheses.

Table 7 Performance Related Pay, Job Satisfaction by Gender and Union Status 1998-2004, Fixed Effect Estimates

	Overall		Hours		Pay		Work Itself		*Job Security*	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Profit Sharing/Bonuses Only	0.050***	0.050	0.031	0.016	0.116*	0.071**	-0.020	-0.041	0.119*	0.112*
	(0.028)	(0.033)	(0.027)	(0.032)	(0.027)	(0.031)	(0.028)	(0.033)	(0.027)	(0.033)
Performance Pay Only	0.061	0.048	0.139*	-0.003	0.190*	0.129*	0.022	0.068	0.149*	0.056
	(0.043)	(0.048)	(0.042)	(0.046)	(0.042)	(0.046)	(0.042)	(0.046)	(0.043)	(0.047)
Profit Sharing/Bonuses and Performance Pay	0.018	-0.008	-0.039	0.017	0.124*	0.133*	-0.048	-0.001	0.166*	0.123*
	(0.039)	(0.047)	.(0.037)	(0.046)	(0.038)	(0.047)	(0.039)	(0.047)	(0.038)	(0.048)
Observations	21,286	21,928								
	Union	Non-Union	Union	Non-Union	Union	Non-Union	Union	Non-Union	Union	Non-Union
Profit Sharing/Bonuses Only	0.128*	0.030	0.022	0.025	0.118*	0.087*	0.050	-0.033	0.021	0.141*
	(0.047)	(0.025)	(0.036)	(0.041)	(0.046)	(0.024)	(0.047)	(0.025)	(0.046)	(0.025)
Performance Pay Only	0.050	0.117*	0.158*	0.052	0.283*	0.128*	0.078	0.069	0.149*	0.093**
	(0.052)	(0.044)	(0.051)	(0.041)	(0.052)	(0.042)	(0.052)	(0.043)	(0.052)	(0.040)
Profit Sharing/Bonuses and Performance Pay	0.120**	-0.012	0.073	-0.053	0.295**	0.049	0.045	-0.022	0.218*	0.145*
	(0.060)	(0.037)	(0.059)	(0.035)	(0.059)	(0.035)	(0.059)	(0.037)	(0.059)	(0.037)
Observations	14,478	25,737								

*, **, *** indicate statistical significance at 1%, 5% and 10%, respectively. Numbers in parentheses are standard errors. The specification includes all variables that show change for individuals across the waves.

APPENDICES:

Appendix A1 – Summary Statistics, Pay Scheme and Job Satisfaction, Employees Age 20-65 1998-2004

	Overall	Pay	Hours	Security	Work Itself
Base (27100)	5.35	4.86	5.23	5.43	5.45
Profit Sharing/Bonuses Only (9318)	5.35	5.02	5.16	5.54	5.39
Performance Pay Only (2865)	5.30	4.98	5.15	5.53	5.34
Profit Sharing/Bonuses and Performance Pay (3539)	5.25	5.08	5.04	5.43	5.32
Sample Size	43,215				

Source: BHPS. Job satisfaction reported on 1-7 Likert scale.

Appendix A2 – Sample Statistics, Employees Aged 20-65, 1998-2004.

Variables	Mean	Std Dev
Profit Sharing/Bonuses Only	0.216	
Performance Pay Only	0.066	
Profit Sharing/Bonuses and Performance Pay	0.089	
Male	0.493	
Age (years)	38.864	11.056
Tenure	11.694	7.458
Married	0.579	
Highest Level of Education:		
< A-Level	0.510	
A-Level	0.218	
Diploma	0.089	
Degree	0.146	
Higher Degree	0.037	
Log Pay	6.047	0.953
Normal Hours Worked	35.221	9.561
Union Member	0.335	
Public Sector Worker	0.341	
Temporary Job	0.042	
Manager/Supervisor	0.382	
Promoted in Last Year	0.065	
Pension	0.565	
Employer Provided Health Insurance	0.090	
Employer Provided Training	0.198	
Firm Size: 1-24 workers	0.327	
25-99 workers	0.267	
100-499 workers	0.230	
500 workers plus	0.176	
Observations	43,215	

*Source: BHPS

REFERENCES:

Akerlof, G. and Yellen, J. (1988). Fairness and Unemployment. *American Economic Review,* **78**, 44-49.

Baker, G. (1992). Incentive Contracts and Performance Measurement. *Journal of Political Economy*, **100**, 598-614.

Baurer, T.K. (2004). High Performance Workplaces and Job Satisfaction: Evidence from Europe. *IZA Discussion Paper no. 1265*.

Brown, M. (2001). Unequal pay, unequal responses? Pay referents and their implications for pay level satisfaction. *Journal of Management Studies*, **38**, 879 – 96.

Brown, S. and Sessions, J.G. (2003). Attitudes, expectations and sharing. *Labour*, **17**, 543 – 69.

Clark, A. and Oswald, A. (1996) Satisfaction and comparison income. *Journal of Public Economics*, **61**, 359 – 81.

Clark, A., Oswald, A. and Warr, P. (1997). Is job satisfaction U-shaped in age? *Journal of Occupational and Organization Psychology*, **69**, 57 – 81.

Clark, A. (2001). What really matters in a job? Hedonic measurement using quit data. *Labour Economics*, **8**, 22 - 42.

Drago, R. (1996). Workplace transformation and the disposable workplace: Employee involvement in Australia," *Industrial Relations*, **35**, 526 – 43.

Drago, R. and Garvey, G. (1998). Incentives for helping on the job: Theory and evidence. *Journal of Labor Economics*, **16**, 1 – 25.

Drago, R. and Heywood J.S. (1995). Choice of Payment Schemes: Australian Establishment Data. *Industrial Relations*, **34**, 507 – 31.

Ewing, B.T. (1996). Wages and Performance Base Pay: Evidence from the NLSY. *Economics Letters*, **51**, 241 - 46.

Fernie, S. and Metcalf, D. (1999). (Not) hanging on the telephone: Payment systems in the new sweatshop. *Advances in Industrial Relations*, **9**, 23 – 68.

Freeman, R.B. and M.M. Kleiner. (2005). The Last American Shoe Manufactures: Decreasing Productivity and Increasing Profits in the Shift to Continuous Flow Production. *Industrial Relations*, **44**, 307 –330.

Frey, B.S. and Jegen, R. (2001). Motivational crowding theory. *Journal of Economic Surveys*, **15**, 589 – 611.

Gibbons, R. (1987). Piece-rate incentive schemes. *Journal of Labor Economics*, **5**, 413 – 29.

Gneezy, U. and Rustichini, A. (2004). Gender and Competition at a Young Age. *American Economic Review*, **94**, 377 – 81.

Goddard, J. (2001). High performance and the transformation of work? The implications of alternative work practices for the experience and outcomes of work. *Industrial and Labor Relations Review*, **54**, 776 – 805.

Green, F. (2004). Why Has Work Effort Become More Intense? *Industrial Relations*, **43**, 709-741.

Heywood, J.S., Huebler, O. and Jirjahn, U. (1998). Variable Payment Schemes and Industrial Relations: Evidence from Germany. *Kyklos*, **51**, 327 – 57.

Heywood J.S., Jirjahn. U. and Tsertvadze. G. (2005a) Does profit sharing reduce conflict with the boss? Evidence from Germany. *International Economic Journal*, **19**, 235 – 50.

Heywood J.S., Jirjan. U. and Tsertrvadze, G. (2005b) Getting along with colleagues: Does profit sharing help or hurt? *Kyklos*, **58**, 557 - 74.

Heywood J.S., Siebert W.S. and Wei, X. (2002). Worker Sorting and Job Satisfaction: The Case of Union and government Jobs, *Industrial and Labor Relations Review*, **55**, 595 – 609.

Heywood, J.S. and Wei, X. (2006). Performance Pay and Job Satisfaction. *Journal of Industrial Relations*, **48**, 523 – 40.

Issac, J.E. (2001). Performance Related Pay: The Importance of Fairness. *Journal of Industrial Relations*, **43,** 111- 23.

Kandel, E. and Lazear, E.P. (1992). Peer Pressure and Partnerships. *Journal of Political Economy*, **100**, 801 – 17.

Kennedy P.W. (1995). Performance pay, productivity and morale. *Economic Record*, **71**, 240 – 47.

Kim, D.O. (1999). Determinants of the Survival of Gainsharing Programs. *Industrial and Labor Relations Review*, **53**, 21-42.

Kim, D.O. and Voos, P.B. (1997). Unionization, Union Involvement, and the Performance of Gainsharing Programs. *Relations Industrielles-Industrial Relations*, **52**, 204 –32.

Kruse, D. L. (1993). *Profit Sharing: Does it Make a Difference?* Kalamazoo Michigan: W.E. Upjohn Institute for Employment Research.

Lazear, E.P.(1995). *Personnel Economics*, MIT Press, Cambridge.

Lazear, E.P. (2000). Performance pay and productivity. *American Economic Review*, **90**, 1346 – 61.

MacLeod, W.B. and Parent, D. (1999). Job Characteristics and the Form of Compensation, in *Research in Labor Economics*, 18, pp. 177-242, ed. S Polacheck. Samford, CT: JAI Press.

Marsden, D., French, S. and Kubo, K. (2001). Does performance pay de-motivate, and does it matter? *Discussion Paper: 503*, London School of Economics, Centre for Economic Performance.

McCausland, W., Pouliakas, K. and Theodossiou, I. (2005). Some are punished and some are rewarded: A study of the impact of performance pay on job satisfaction. International Journal of Manpower, **26**, 636-659.

McKelvey, R. and Zavonia, W. (1975). A statistical model for the analysis of ordinal level dependent variables. *Journal of Mathematical Sociology*, **4**, 103 – 20.

Milgrom, P. and Roberts, J. (1992). *Economics, Organization and Management*. New York: Prentice Hall.

Oettinger G.S. (2001). Do piece rates influence effort choices? Evidence from stadium vendors. *Economics Letters*, **73**, 117 - 23.

Paarsch, H. and Shearer, B. (2000) Piece rates, fixed wages, and incentive effects: Statistical evidence from payroll records. *International Economic Review*, **41**, 59 - 92.

Parent, D. (1999). Methods of pay and earnings: A longitudinal analysis. *Industrial and Labor Relations Review*, **53**, 71 – 86.

Prendergast, C. (1999). The Provision of Incentives in Firms. *Journal of Economic Literature*, **37**, 7-63.

Slwika, D. and Grund, C. (2006). Performance Pay and Risk Aversion. *IZA Discussion Paper No. 2012* (March).

Taylor, M.F., Brice, J., Buck, N. and Prentice-Lane, E. (2006). *British Household Panel Survey User Manual Volume B: Codebook.* Colchester: University of Essex.

Weitzman, M. L. (1984). *The Share Economy*, Cambridge, MA: Harvard University Press.

ENDNOTES

[1] This is not to say that in all circumstances piece rates automatically have this influence. Inability to measure performance or incompatible managerial policies can, for instance, make piece rates unprofitable (Freeman and Kleiner 2005).
[2] Earlier waves also included questions on worker satisfaction with promotion prospects, relations with the boss and their use of initiative.
[3] Means for the full pooled sample covering 1998-2003 are reported in the appendix as Table A1.
[4] Indeed, one can use the Cronbach's alpha to show that the individual dimensions should not be aggregated to a single measure (Heywood et al. 2002).
[5] As there are seven satisfaction categories, three payment scheme variables and 5 dimensions of job satisfaction, we have not presented a full set of marginal effects but they are available from upon request.
[6] Specifically we estimate ordered probits with fixed effects in Limdep 8.0.