Pay cuts

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Abstract

This paper tests the 'morale' theory of downward nominal wage rigidity. This theory relies on workers disliking nominal pay cuts: cuts should make workers less happy. We investigate this using panel data on individual employees' pay and satisfaction. We confirm that nominal cuts do make workers less happy than if their pay had not fallen. But we find no difference in the effect on happiness of cuts and pay freezes. This represents important information about the nature of wage rigidity in practice and the applicability of the morale theory. The morale theory may be able to explain generalised downward wage rigidity, but apparently fails to explain downward nominal rigidity.

Keywords: Wage rigidity, Satisfaction

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1 Introduction

This paper tests an influential theory that has been used to explain downward nominal wage rigidity, namely the 'morale' theory. This proposes that employers are reluctant to cut pay because they know workers have a great dislike of falls in the monetary value of their pay. Employers realise that if they cut pay, workers' morale will suffer. Workers will regard a pay cut as an insult and an expression that the employer values them less. Workers' productivity will fall, through slacking on the job and increased labour turnover. In these circumstances, it would rarely be in the employer's best interests to cut pay. Recent work by Bewley (1999) has emphasised the morale theory and presented evidence, from interviews with over 300 business representatives in the North Eastern United States during the recession of the early 1990s, that this accords with employers' attitudes. Howitt (2002), among others, has noted the challenge presented to macroeconomic theories based on rational behaviour by the morale explanation.

Despite the importance of this theory of downward wage rigidity, there has to date been no econometric test of the validity of its underlying hypothesis – that workers dislike pay cuts. This paper is the first to use panel data on individual workers to investigate the link between pay cuts and satisfaction. Previous research has relied on relatively small-scale surveys of business people (Agell and Lundborg, 1995, 1999; Bewley, 1999; Blinder and Choi, 1990; Campbell and Kamlani, 1997) or experimental evidence (Burda et al., 1998; Fehr and Falk, 1999). The data and method we use have certain advantages. A large number of individuals contribute to our evidence: over 6,000, interviewed in up to 9 consecutive years, giving over 20,000 observations, compared to the inevitably small numbers from personal interviews or questionnaires. Importantly, the survey we use asks workers directly about their happiness, rather than relying on managers' views about the effect of pay cuts. We can follow individuals over time, as their pay and happiness change, whereas previous ethnographic evidence has had to rely on snapshots essentially involving recall statements or opinions, while experimental evidence might not reflect labour market reality. The lack of observations

and sometimes necessarily unstructured nature of the data from ethnographic surveys hamper rigorous analysis of the issues, whereas we can employ econometric techniques with consequent statistical reliability. We are careful to ensure that our results are not adversely affected by measurement error, which is sometimes considered a problem affecting longitudinal survey data.

The data suggest that a substantial number of workers take nominal pay cuts. We confirm that pay cuts reduce workers' happiness compared with those whose pay does not fall. But we find no evidence that pay cuts are worse than pay freezes. This represents important information on the nature of wage rigidity in practice and the applicability of the morale theory. The morale theory may be able to explain generalised (or real) downward wage rigidity, but apparently fails to explain downward nominal rigidity. Other results presented here add to previous work on what influences happiness (see Frey and Stutzer, 2002, for a survey).

2 Data

We use the first nine waves of data from the British Household Panel Study, which follows more than 6,000 individuals over the nine years 1991-1999, to investigate the link between pay cuts and happiness.

To investigate the morale theory of downward nominal rigidity we need to restrict our sample to 'stayers' – that is, workers who remain with the same employer and are neither promoted nor change grade (70% of all workers). We need to look at stayers because we are investigating the reluctance of employers to cut the pay of existing employees in a given job, even in the face of a demand reduction.

Our use of data relating to stayers brings up a possible selection issue, although we argue that it is not relevant to our test of the morale theory of nominal rigidity. Our sample does not include people who, following a pay change, move job. Some workers who are made very unhappy by a pay cut may quit, in which case our data would tend to underestimate any negative overall effect of pay cuts on morale. But in some cases where pay cuts and employment reductions both occur, those remaining may be relatively happy

compared to those who lost their job, in which case the direction of bias is reversed. However, it is important to realise that the morale theory simply focuses on the happiness of those that remain in their job: it is these stayers whose morale matters to employers and influences their decision to cut pay or not.

The pay variable is usual monthly pay (including overtime and bonuses), and we also construct hourly pay statistics in an attempt to show that our findings are not simply due to hours changes. We use monthly pay because we believe hours data to be distorted by measurement error. We can investigate the effect of measurement error in pay by looking at the subsample of individuals who check their pay stubs when reporting pay (on average, 27% of stayers check their pay levels in both relevant years). For these individuals, pay should be recorded without error, to the nearest £1.

Figure 1 shows the distribution of pay growth.[1] Looking at monthly pay statistics, 28% of stayers suffer nominal cuts, 66% enjoy nominal raises, and the remaining 6% have pay that is rigid in nominal terms (these workers experience a real cut equal to the inflation rate). A substantial 13% suffer nominal falls of more than 10%, and 3% experience nominal cuts of 30% or more. 9% experience relatively small real cuts such that their pay rises in nominal terms. Cuts in hourly pay are more frequent than those in monthly pay and raises are correspondingly less common, reflecting the rise in hours worked that has occurred during the sample period. Nominal rigidity is much lower in hourly pay. This might reflect the rise in hours, but it might

[1] Figure 1 summarises around 24,000 observations on over 6,000 individuals' pay growth during 1992-1999. The distribution is typical of individual panel surveys from several countries. See Smith (2000) (British Household Panel Study) and Nickell and Quintini (2001) (New Earnings Survey) for more information on the UK; for the US: Altonji and Devereux (1999), Kahn (1997), Lebow et al. (1995), McLaughlin (1994) (all Panel Study of Income Dynamics), Card and Hyslop (1997) (PSID and Current Population Survey); for Germany: Beissinger and Knoppik (2001) (IAB-Beschäftigtenstichprobe IABS), Decressin and Decressin (2002) (German Socio-Economic Panel); for Switzerland: Fehr and Goette (2000) (Swiss Labour Force Survey and Social Insurance Files); for Belgium: Borghijs (2001) (Belgian Household Panel Study); for Canada: Bowlus (1997) (Labour Market Activity Survey), Fares and Lemieux (2000) (Survey of Consumer Finance); for Australia: Tseng (2001) (Melbourne Institute Wage Survey), Dwyer and Leong (2000) (Mercer Cullen Egan Dell database).

also reflect the well-documented measurement error in hours (see Bound and Krueger, 1991, and Bound, Brown, Duncan and Rodgers, 1989).

During BHPS interviews, individuals are asked a series of questions about their satisfaction with aspects of their job. Individuals are asked to rate their satisfaction on a seven-point scale, with 1 corresponding to "completely dissatisfied", 7 to "completely satisfied" and 4 to "neither satisfied nor dissatisfied". The actual question is as follows: "I'm going to read you a list of various aspects of jobs, and after each one I'd like you to tell me from the card which number best describes how satisfied or dissatisfied you are with that particular aspect of your own present job". This paper focuses on two responses, one concerning "the total pay, including any overtime and bonuses", and the other concerning overall job satisfaction: "All things considered, how satisfied or dissatisfied are you with your present job overall". Overall job satisfaction is asked after questions concerning satisfaction with promotion prospects, pay, relations with superiors, job security, being able to use initiative, the work itself, and hours worked.[2] Overall job satisfaction, but more particularly satisfaction with pay, should reflect any change in workers' happiness and morale following a pay cut.

3 The relationship between happiness and pay growth

The link between morale and pay cuts has been noted by many economists. The link has been given greater prominence by recent small-scale survey evidence including Agell and Lundborg (1995, 1999), Blinder and Choi (1990) and Campbell and Kamlani (1997), and most influentially Bewley (1995, 1998, 1999).[3]

Bewley interviewed over 300 businessmen, union leaders, job recruiters and unemployment counsellors in the north-eastern United States, in an attempt to discover why pay did not fall during the recession of the early 1990s.

[2] Questions on satisfaction with promotion prospects, relations with boss, and use of initiative were not asked after Wave 7.

[3] See Howitt (2002) for a summary of the findings of these surveys.

He presents evidence that many of his interviewees believe that pay cuts reduce morale and demotivate workers. Workers' standard of living is reduced by a pay cut. In addition, managers claim that workers would be insulted by a pay cut, that workers would perceive it as reflecting their lack of worth to the company, and their self-esteem would fall. Whereas the 'income effect' might take some time to be noticed (due for example to the buffer of saving – although several managers opined that workers spend all they are paid), the direct morale effect could be rapid. To take one example of several relevant quotes, a manager of a restaurant with 30 employees states: "I have never cut anyone's pay. I don't believe in it in principle... A pay cut would be interpreted as a punishment, even if it were done across the board. It would be insulting and would lower people's standard of living and for both those reasons, it would hurt morale and get people working against rather than for the restaurant. In this business, that could happen in a couple of days." (Bewley, 1999, p.175).

The morale theory suggests that pay cuts will make workers less happy. But what is the counterfactual? Less happy than what? The alternative we focus on is higher pay, or 'rigid' pay. The precise definition of this alternative – 'rigid' pay – proves to be very important. Bewley (1999) defines rigidity broadly, as "the failure of companies to cut pay" (p.171). This broad definition of pay rigidity contrasts pay cuts with the absence of pay cuts, which in principle could encompass both freezes and raises. Technically, we could write this as $(-\infty, 0)\,[0, +\infty)$, where the square bracket indicates that there is a discontinuity at nominal zero such that freezes are significantly different from nominal cuts. Bewley is prompted to group freezes with raises because he found that "gradual reductions in real wages were acceptable, for the slow decline in living standards caused by pay freezes was less noticeable and more tolerable than abrupt nominal cuts" (p.433). Bewley's evidence is clearly consistent with the morale theory being a theory of nominal downward rigidity. The implied discontinuity in the pay growth–morale relationship at nominal zero might reflect money illusion, loss aversion, or a similar psychological effect (see Shafir et al., 1997, and Kahneman et al., 1986). Bewley (1999) argues that the discontinuity is better characterised in terms of the

'insult' felt by workers following a deliberate decision by management to cut their pay, in addition to the fall in their standard of living (p.432). Whatever the explanation, this conception of downward nominal rigidity has been used as the basis for many macroeconomic models (see Howitt, 2002, for a discussion).

In our empirical work we use this broad definition of rigidity, contrasting nominal cuts with the absence of such cuts. But any finding that cuts are worse than non-cuts would be consistent with cuts being worse than just raises, or just freezes, or both. So we also focus on a 'narrow' conception of nominal rigidity, distinguishing pay freezes from nominal raises and from nominal cuts. This allows us to distinguish their relative effects on morale, and represents a test of the $(-\infty, 0)\,[0, +\infty)$ hypothesis. We should find freezes better for morale than cuts if the morale story is to explain downward nominal wage rigidity.

Table 1 gives an indication of the relationship between pay change and happiness for British stayers during the 1990s. The figures relate to "happy" workers – combining the top two satisfaction categories (of seven) – and "unhappy" workers – the lowest two satisfaction categories. More workers are satisfied than are dissatisfied. Dissatisfaction with pay is much more common than dissatisfaction with the job overall. 11% of all workers report themselves not satisfied with their pay, compared to under 5% dissatisfied with their job. 41% are satisfied with their pay, whereas almost 60% are satisfied with their job. A greater proportion of those who take pay cuts are not satisfied compared with those who have raises. For example, 12.5% of those who report nominal monthly cuts are dissatisfied with their pay compared with 9.8% of those who experience nominal monthly raises (which represents a difference significant at the 1% level). 39% of those who have nominal monthly cuts are satisfied with their pay compared with 42% of those who enjoy raises.[4]

Our econometric work essentially investigates whether the differences in

[4] Although this again implies that those taking cuts are significantly less happy, it is perhaps surprising that such a large fraction of workers taking cuts report themselves happy with their pay (and job).

the full distribution of satisfaction between those who have pay cuts and other workers are significant, controlling for other relevant factors. We isolate the effect of a pay cut on the satisfaction of a given worker econometrically by using individual-specific effects to control for unobserved individual characteristics (specifically, we include random individual effects). We use ordered probit models since satisfaction, the dependent variable, has seven ordinal categories. In addition to controlling for unobservable individual effects, we control for observable factors that may affect happiness, including a quadratic in age, years of education, non-labour income, and dummies for gender, non-white, marital status and poor health.[5] The relation between happiness and pay cuts might also be affected by prevailing economic conditions such as the risk of unemployment: people might be less unhappy to take a pay cut in a declining industry or region, for example. So we control for survey year, industry and region. Implicit contracts or other arrangements guaranteeing wage stability are unlikely to apply to certain occupations, such as sales, (and this will be known when that occupation is chosen) so we control for occupation. These four sets of dummies essentially control for the increased likelihood of voluntary pay cuts in certain circumstances. We thereby identify the effect of involuntary pay cuts on workers' morale. It is these involuntary cuts that would be most likely to reduce morale.

Table 2 confirms that pay cuts typically make workers unhappy compared to those who do not suffer cuts. A random effects ordered probit regression of the seven-category pay satisfaction variable on the controls and a bivariate nominal pay cut dummy reveals a significant negative effect: experiencing a pay cut reduces the likelihood of individuals reporting high satisfaction, and increases the probability that they will report themselves dissatisfied, compared to their happiness if they did not have a pay cut. Marginal effects can be calculated and indicate that, on average for satisfaction with pay, a stayer who has a cut in their monthly pay is 0.9 percentage points more likely to report themselves in the bottom two satisfaction categories (i.e. 8.1% more likely), and 4.3 percentage points (10.5%) less likely to report themselves in

[5]Similar characteristics have previously been found to affect satisfaction. See for example Blanchflower and Oswald, 2003, Di Tella et al., 2001, and Frey and Stutzer, 2002.

the top two satisfaction categories.[6]

As remarked, we control for age, age squared, number of years' education, marital status, race, gender, health and non-labour income (see Table 2). Older people seem happier with their pay. Previous research has suggested a U-shaped relationship between overall job satisfaction and age (happiness declining until the early thirties and then rising – see Blanchflower and Oswald, 2003), but we find that this U shape disappears once we allow for individual-specific (random) effects (specifically, we find the age-happiness relationship to be positively sloped, linearly for pay and quadratically for the job overall). More educated people are less satisfied, which would be consistent with higher, unfulfilled, aspirations (our results for education contrast with those of Blanchflower and Oswald, 2003, who report a positive education effect for workers in the United States). Education is associated with a greater degree of dissatisfaction with the job than with pay. Married people are more satisfied (more so with their pay than overall), as are women (the excess happiness of women is greater for the job in general than with pay). Non-whites are less satisfied (even more dissatisfied with their pay than overall). A larger non-labour income raises satisfaction. People in poor health are less happy, but the effect is not significant for pay.

Working in Energy and Water Supplies and the Chemical and Allied industries makes stayers more likely to report greater satisfaction with pay than stayers in other industries, and stayers in Distribution, Hotels and Catering are most dissatisfied with their pay.[7] Unsurprisingly, perhaps, Managers are far more likely than other occupations to be happy with their pay. Pro-

[6] The marginal effects are calculated as the effect of the independent variable on the probability of being in category j, where $j = 0, 1, ..., 6$ are the seven ordinal levels of satisfaction that respondents can choose. The marginal effect is given by

$$\frac{\partial \Pr(j)}{\partial x_i} = \phi\left(\mu_{j-1} - \beta' x_i\right) - \phi\left(\mu_j - \beta' x_i\right) \beta$$

where ϕ is the standard normal density; μ_j are the threshold parameters, i.e. the estimated values of the unobserved (latent) continuous dependent variable that separate category j from category $j-1$ ($\mu_0 = 0$; $\mu_6 = \infty$); β are the estimated coefficients; x_i are the independent variables. For a given x_i, these marginal effects are calculated at the means of the other explanatory variables.

[7] We do not report the individual coefficients for each industry, occupation, region and year in Table 2.

fessionals are also relatively happy, whereas Plant and Machine Operatives and Craft and Related occupations are relatively dissatisfied with their pay. There are no differences in pay satisfaction across regions that are significant at the 5% level, but stayers in the region Yorkshire and Humberside are most likely to report pay satisfaction and workers in Wales, Scotland and Greater London are most likely to be dissatisfied with their pay. Pay dissatisfaction is most likely near the beginning of the sample, during 1993-1997, and satisfaction is most likely in the later years, 1998-1999.

So far we have focused on the 'broad' definition of nominal rigidity, comparing those who take cuts with everyone else. To investigate the 'narrow' definition of rigidity that is often the focus of theoretical work we need instead to compare pay cuts with pay freezes. We do this by adding a 'rise' dummy to the regressions. This isolates those with rigid pay as the base case (around 1,250 cases for monthly pay and 550 for hourly pay, once we have eliminated cases with missing data on the control variables), to which the 'cut' and 'rise' effects are relative. Table 3 indicates that there is no evidence that pay cuts of any size reduce happiness more than pay freezes do: the coefficient on the cut dummy is insignificantly different from zero.[8] All of the negative effect of pay cuts versus non-cuts stems from the comparison of those taking cuts with those enjoying raises.

This result is very strong and perhaps surprising. We find no evidence that money illusion or loss aversion operate. Workers do not seem particularly disturbed by falls in the pecuniary value of their pay, compared to the alternative of no change in pay. Instead, workers who suffer nominal cuts and those who have nominal freezes are all less happy than those whose pay rises.

Macroeconomic theory often supposes that freezes have a very different

[8] For satisfaction with pay, the sign of the coefficient on the cut dummy becomes positive once we add the rise dummy, although for overall job satisfaction the coefficient remains negative. A significant positive coefficient on the cut dummy in Table 3 would imply that workers taking cuts were happier than those experiencing freezes, but the effects in Table 3 are not significant at the 5% level (that for hourly pay is significant at the 8% level and that for monthly pay at 25%). The controls used for these regressions are the same as in Table 2. The addition of the 'rise' dummy, which is the only change, leaves the coefficients on the controls almost unaltered, so we do not report them.

effect on workers' morale than nominal cuts. As noted above, we can write this as $(-\infty, 0)\,[0, +\infty)$: the hypothesis proposes a discontinuity at zero such that cuts are significantly worse than freezes. Instead, we find empirically that freezes can be grouped with nominal cuts, and both differ from raises. We find $(-\infty, 0]\,(0, +\infty)$, indicating that there is a 'break' in the satisfaction–pay change relationship, but that this occurs strictly above nominal zero.[9]

We find that the morale effect does not support strict downward nominal rigidity, but instead supports a story of broad or generalised downward rigidity possibly more akin to 'real' rigidity.[10] Of course, this does not mean there is no (downward) nominal rigidity. It means that the morale explanation of this phenomenon is not supported by the evidence. Downward nominal wage rigidity could be explained instead by other theories, including menu costs or overlapping contracts (see for example Bewley, 1999 ch.20, for a discussion of theories of wage rigidity).

As noted earlier, measurement error in pay is an important issue in data from panel surveys of individuals. We can investigate whether our findings are robust to possible measurement error by repeating the regressions on the subsample of workers who check their pay stubs. Pay for these workers will be accurate and reported cuts truly capture reductions in total pay.[11] Table 4 shows that the results are replicated for the measurement-error-free subsample. Nominal cuts make workers less happy than non-cuts, for both pay and overall job satisfaction. But once we separate out freezes it again seems that freezes resemble cuts more than raises in their effect on happiness

[9] We can be vague about the pay change–satisfaction relationship above zero as it is not the focus of this paper. For example, there may be a continuous increase in satisfaction with increasing raises, so that on average raises are significantly better than freezes (in this case, small raises and freezes might have insignificantly different effects on satisfaction). Alternatively, there might be a 'jump effect'. It might be that any positive raise is significantly better than a freeze, or the break might occur at real zero: perhaps it is real raises that make workers significantly happier than nominal cuts and freezes.

[10] Howitt (2002) notes that "Bewley's [(1999)] evidence does not make it entirely clear whether real or nominal wage cuts are more damaging to morale ... He did pose the question to six of his subjects, who told him that nominal wage rigidity was stronger than real rigidity. He concludes that this is true" (pp.129-130).

[11] Howitt (2002) has pointed out that the pay stub refers to latest, rather than usual, pay. In around 80% of cases, though, these are identical.

(all cut coefficients become insignificant, indicating no difference from the base case of freezes, and they become positive, whereas rise coefficients are larger and more significantly positive).

4 Conclusion

This paper used data on individual workers' pay and reported happiness to investigate the morale theory of downward nominal rigidity. Raw data show many pay cuts. According to the morale theory, workers should be less happy following pay cuts. We find clear evidence that workers who take nominal cuts are less happy, overall and specifically with their pay, than other workers whose pay does not fall. But versus those whose pay is rigid, those suffering nominal cuts report themselves no worse off. Our results suggest that the morale effect may generate generalised downward rigidity in the labour market, rather than strict nominal rigidity.

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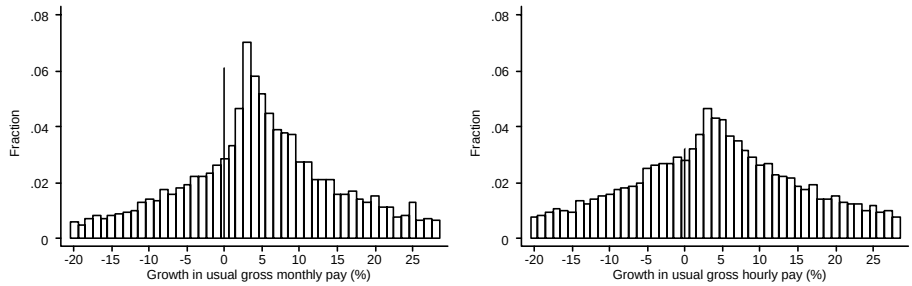

Figure 1: The distribution of nominal pay growth, 1991/2–1998/9 (stayers)

The vertical line at zero represents the fraction of stayers whose pay is rigid from one year to the next. Each bar of the histogram is centred on an integer (we only show pay changes between -20% and 29%). The bar centred on zero includes all workers except those with pay freezes.

Table 1

Satisfaction and changes in pay

Sample	Proportion of workers (%)				Cases
	Not satisfied		Satisfied		
	with pay	overall	with pay	overall	
Nominal monthly					
Cut	12.5	5.6	38.8	57.2	6,713
Rigid	13.6	4.4	41.3	60.6	1,437
Rise	9.8	4.2	42.3	59.3	15,867
All	10.8	4.6	41.3	58.8	24,017
Nominal hourly					
Cut	11.7	4.9	39.3	56.9	7,738
Rigid	12.9	3.8	42.8	66.7	650
Rise	10.3	4.5	42.0	59.0	14,569
All	10.8	4.6	41.1	58.5	22,957

Data relate to stayers. 'Not satisfied' combines categories 1 and 2 on a 7-category ordinal satisfaction scale. 'Satisfied' combines categories 6 and 7. Overall satisfaction relates to the job. Numbers of cases relate to satisfaction with pay.

Table 2

Ordered probit evidence on the relation between satisfaction and pay cuts

Base: Workers without nominal pay cut

Dependent variable:	Satisfaction with pay		Overall job satisfaction	
	monthly	hourly	monthly	hourly
cut	-0.114	-0.087	-0.078	-0.075
	(−6.3)	(−4.8)	(−4.2)	(−4.2)
age/10	0.156	0.188	-0.042	-0.024
	(1.9)	(2.2)	(−0.5)	(−0.3)
age^2/100	-0.007	-0.010	0.019	0.018
	(−0.7)	(−1.0)	(1.9)	(1.7)
education/10	-0.102	-0.069	-0.445	-0.430
	(−1.6)	(−1.0)	(−7.0)	(−6.5)
married dummy	0.161	0.154	0.083	0.077
	(5.8)	(5.5)	(2.9)	(2.7)
female dummy	0.267	0.289	0.388	0.412
	(7.2)	(7.6)	(10.8)	(11.3)
nonwhite dummy	-0.232	-0.216	-0.185	-0.165
	(−2.2)	(−2.0)	(−1.8)	(−1.5)
poor health dummy	-0.042	-0.050	-0.196	-0.192
	(−1.0)	(−1.2)	(−5.0)	(−4.7)
non-labour income	0.056	0.049	0.052	0.042
	(4.6)	(3.3)	(5.9)	(3.9)
10 region dummies	yes	yes	yes	yes
9 industry dummies	yes	yes	yes	yes
8 occupation dummies	yes	yes	yes	yes
8 wave dummies	yes	yes	yes	yes
Observations	21,399	20,486	21,423	20,498
Individuals	5,458	5,340	5,464	5,343

The table reports ordered probit coefficients. 'Cut' is a dummy variable taking value 1 if a worker had a nominal pay cut and 0 otherwise. The dependent variables are reported satisfaction with pay or with the job overall, on a seven-category ordinal scale. Data relate to stayers' usual pay. Z statistics for test of zero coefficient are in parentheses. Estimations allow for random effects.

Table 3

Ordered probit evidence on the relation between satisfaction and pay cuts

Base: Workers with pay freezes

Dependent variable:	Satisfaction with pay		Overall job satisfaction	
	monthly	hourly	monthly	hourly
cut	0.043	0.096	-0.012	-0.081
	(1.2)	(1.8)	(−0.3)	(−1.5)
rise	0.169	0.188	0.070	-0.007
	(4.8)	(3.6)	(1.9)	(−0.1)
Observations	21,399	20,486	21,423	20,498
Individuals	5,458	5,340	5,464	5,343

The table reports ordered probit coefficients on a cut dummy variable taking value 1 if a worker had a nominal pay cut and 0 otherwise and a rise dummy taking value 1 if a worker had pay raise and 0 otherwise. The dependent variables are reported satisfaction with pay or with the job overall, on a seven-category ordinal scale. Data relate to stayers' usual pay. Z statistics for test of zero coefficient are in parentheses. Controls include age, age squared, years of education, gender dummy, married dummy, non-white dummy, poor health dummy, non-labour income, and region, industry, occupation and wave dummies (coefficients not reported). Estimations allow for random effects.

Table 4

The impact of measurement error on the relation between satisfaction and pay cuts

Measurement-error-free subsample

	Base: Workers without nominal pay cut			
Dependent variable:	Satisfaction with pay		Overall job satisfaction	
	monthly	hourly	monthly	hourly
cut	-0.103	-0.081	-0.125	-0.099
	(−2.6)	(−2.1)	(−3.0)	(−2.6)
rise				
Observations	5,694	5,472	5,692	5,470
Individuals	2,116	2,069	2,116	2,069

	Base: Workers with pay freezes			
Dependent variable:	Satisfaction with pay		Overall job satisfaction	
	monthly	hourly	monthly	hourly
cut	0.061	0.089	0.129	0.136
	(0.6)	(0.7)	(1.2)	(0.9)
rise	0.171	0.174	0.263	0.239
	(1.8)	(1.3)	(2.5)	(1.5)
Observations	5,694	5,472	5,692	5,470
Individuals	2,116	2,069	2,116	2,069

The table reports ordered probit coefficients on a cut dummy variable taking value 1 if a worker had a nominal pay cut and 0 otherwise and a rise dummy taking value 1 if a worker had pay raise and 0 otherwise. The dependent variables are reported satisfaction with pay or with the job overall, on a seven-category ordinal scale. Data relate to stayers' usual pay and include only stayers whose pay stubs were checked both this year and last. Z statistics for test of zero coefficient are in parentheses. Controls include age, age squared, years of education, gender dummy, married dummy, non-white dummy, poor health dummy, non-labour income, and region, industry, occupation and wave dummies (coefficients not reported). Estimations allow for random effects.