Impact of wages and job levels on worker absenteeism

Christian Pfeifer
Institute of Labour Economics, Leibniz University Hannover, Hannover, Germany

Abstract

Purpose – This paper seeks to analyse to what extent absolute wage levels, relative wages compared with colleagues, and the position in a firm's hierarchy affect workers' absenteeism behaviour.

Design/methodology/approach – The paper uses personnel data of a large German company from January 1999 to December 2005. The data set contains 62,774 monthly observations of 1,187 full-time white-collar workers. Probit and Tobit models for individual monthly absenteeism are estimated.

Findings – Absenteeism is negatively correlated with absolute wages, relative wages, and hierarchical levels, which is in line with the paper's hypotheses. Moreover, the results indicate that a positive relative wage has a stronger impact than a negative relative wage, which gives rise to the issue of unequal wage structures.

Research limitations/implications – The findings point to the relevance of interdependent preferences and status in utility functions. From the non-linear relationship between relative wages and absenteeism it follows that an unequal wage structure has the benefit that relatively better paid workers are absent less frequenty, while the costs of higher absenteeism of workers at the lower tail of the wage distribution are rather low.

Practical implications – The results show that not only the absolute wage level but also status-related factors (e.g. relative wage, hierarchical level) affect employees' work effort and that unequal wage structures can be efficient to some degree.

Originality/value – The paper provides "real world" evidence from scarce personnel data for the importance of interdependent preferences and status. Furthermore, the non-linear relationship between relative wages and absenteeism is examined.

Keywords Absenteeism, Pay, Hierarchical organizations, Germany

Paper type Research paper

1. Introduction

Previous studies of absenteeism have established a negative correlation between wages and absenteeism as a proxy for work effort (for a literature review see Barmby *et al.*, 1991; Brown and Sessions, 1996). Studies using individual data like household surveys analyse the impact of individual wages on workers' absenteeism behaviour (e.g. Allen, 1981a; Leigh, 1984; Drago and Wooden, 1992; Allen, 1996; Winkelmann, 1999; Barmby and Gesine, 2000), whereas studies using establishment data analyse the impact of firms' average wages on aggregated absenteeism in firms (e.g. Allen, 1981b; Chaudhury and Ng, 1992; Barmby and Gesine, 2000; Heywood and Jirjahn, 2004; Ose, 2005). Both types of data sets are subject to measurement errors because information is provided by workers or managers. Moreover, individual data sets largely neglect firm

The author would like to thank Andrew Clark, Thomas Cornelissen, Knut Gerlach, participants at the SMYE 2008, and two referees of this journal for helpful comments. Financial support from the Fritz Thyssen Foundation is gratefully acknowledged.

International Journal of Manpower
Vol. 31 No. 1, 2010
pp. 59-72

0143-7720
DOI 10.1108/01437721011031694

characteristics that interact with employee behaviour like absenteeism (Barmby *et al.*, 1991; Barmby and Gesine, 2000). Establishment data sets have the drawback that variables are measured for the entire firm and, hence, cannot account for worker heterogeneity. These problems can be mitigated by using personnel data of one firm, because firm characteristics are hold constant and objectively measured absenteeism for every worker is available. As such data sets are difficult to access, they are rarely used. Barmby and Treble (1991), Brown (1994), and Barmby *et al.* (1995) analyse personnel records of British manufacturing plants. Their results support a negative correlation between wages and absenteeism.

In the subsequent analysis, I use personnel data of a large German company. One advantage of the personnel data set is that it contains not only individual absolute wages but also wages of co-workers, which allows the calculation of relative wages. Moreover, it is possible to analyse the impact of a worker's position in the firm's hierarchy on absenteeism behaviour. This issue has not been addressed in previous studies on absenteeism. Experimental economics, however, has recently provided some laboratory evidence on the effect of relative wage positions on work effort (e.g. Fehr and Gächter, 2000; Charness and Kuhn, 2007; Clark *et al.*, 2006).

Main findings of my econometric analysis are that workers with higher absolute and relative wages and at higher hierarchical levels are less absent, which points to the importance of interdependent preferences and status in workers' utility functions. Furthermore, I find that positive relative wage positions have a larger effect than negative relative wage positions, which gives rise to the issue of the efficiency of unequal wage structures. The paper is organized as follows: section 2 presents theoretical considerations and research hypotheses. The data, variables, and methods are described in section 3. Section 4 contains the econometric results. The paper concludes with a short summary and discussion of the results.

2. Theory and hypotheses

2.1 Absolute wages

In the framework of the static neo-classical labour supply model, absenteeism can be interpreted as a worker's adjustment-to-equilibrium strategy (Allen, 1981a; Dunn and Youngblood, 1986; Brown and Sessions, 1996). If a worker has signed an employment contract with a larger than his utility maximizing number of working hours, he might use absenteeism to decrease his working time to the utility maximizing equilibrium. As long as the substitution effect dominates the income effect, a wage increase leads to a larger number of utility maximizing working hours and, hence, to less absenteeism. A higher wage can be interpreted as compensation for working more hours and for being less absent. In Germany, workers who are absent due to sickness still receive their daily pay (Barmby and Gesine, 2000) and firms can hardly verify the true health status of absent workers[1]. Thus, a "greedy" worker has an incentive to enjoy absenteeism and to pretend sickness as much as possible. However, workers might not be that "greedy" and choose the initial utility maximizing level as reference point, even if they receive wage replacements. In a dynamic context workers might also consider that today's absenteeism might negatively affect their future career advancement (e.g. promotions).

Another explanation can be found in the gift-exchange model (Akerlof, 1982). If the firm pays a high wage, workers might interpret the firm's behaviour as a gift and react

with positive reciprocity, i.e. they provide more work effort and are less absent. Conversely, workers react with negative reciprocity and more absenteeism to low wages (Dohmen *et al.*, 2006). Non-shirking efficiency wage models (Shapiro and Stiglitz, 1984; Barmby *et al.*, 1994; Ose, 2005) also predict reduced absenteeism. In contrast to the gift-exchange model, however, the worker gets no gift but is punished (fired). Thus, the worker's loss if caught shirking is positively correlated with his wage level:

H1. Workers with a higher absolute wage are less absent.

2.2 Relative wages

In contrast with absolute wages, the impact of relative wages is largely related to comparisons with co-workers. Happiness studies have found that satisfaction does not only depend on one's own income but also on relative income, i.e. on reference levels an individual compares himself (Tomes, 1986; Easterlin, 1995; Clark and Oswald, 1996; Watson *et al.*, 1996; Solnick and Hemenway, 1998; Falk and Knell, 2004; Clark *et al.* 2007). Since job satisfaction is negatively correlated with absenteeism (Winkelmann, 1999), a higher relative wage is likely to be associated with less absenteeism.

Equity theory as a distributive justice principle concentrates on a fair proportion between outcomes and inputs (Adams, 1965). From equity theory follows that a worker, who feels overpaid or underpaid, will adjust his work effort (Akerlof and Yellen, 1990). If a worker compares himself with a co-worker or a group of co-workers, equity is reached in the equilibriums in (1), in which w denotes the wage and e the effort of individuals i and j:

$$\frac{w_i}{e_i} = \frac{w_j}{e_j} \Leftrightarrow \frac{w_i}{w_j} = \frac{e_i}{e_j} \tag{1}$$

If the wage of worker i is higher than the wage of worker j, the effort of worker i should also be larger so that the ratios between w and e of both workers are equal. Hence, a relatively higher wage should be associated with relatively larger effort and, consequently, with less absenteeism.

A higher relative wage can also be interpreted as a status symbol. Social status theory suggests that the relative wage within a group is one determinant of the local social status within this group. Frank (1984a, b) defines status as the relative wage position of a worker in his firm. The nature of relative wages implies that "one person's gain in status can occur only at the expense of a loss in status for others" (Frank, 1984b, p. 549). If status increases a worker's job utility, it should reduce absenteeism for three reasons. First, in the static labour supply model the utility maximizing number of working hours does not anymore depend solely on the absolute wage, which is used for consumption, but also on status in form of the relative wage position. For example a lower absolute wage can be compensated by higher status. Second, the worker enjoys his status primarily if he is at work. Third, if absenteeism is interpreted as shirking and detected shirkers are fired by the firm, the worker could lose his status. Accordingly, Clark *et al.* (2006) and Brown *et al.* (2008) report experimental and survey evidence that wages of co-workers and the individual rank in the wage distribution affect well-being and work effort:

H2. Workers with a higher relative wage than their co-workers are less absent.

2.3 Hierarchical levels

In addition to considerable wage effects, higher hierarchical levels are associated with higher status comprising features like autonomy, authority, responsibility, access to centres of power, and titles, which are non-pecuniary elements of compensation (Frank, 1984b, p. 568). Contrary to relative wages, status in form of hierarchical levels does not imply that a gain in status by one person is at the expense of a status loss for other persons by the same amount. Consider an extreme example in which all workers are supervisors and get the same wage. In such a scenario, a supervisor has no subordinates and no status in a pure reciprocal relationship of hierarchical standing. However, the formal position and title (e.g. supervisor or manager) might be visible to outsiders and lead to higher external status.

After considering workers' behaviour, firms' behaviour in form of screening has to be taken into account, too. A firm is likely to select and to promote workers with less absenteeism to higher hierarchical positions because absenteeism is more costly at higher levels (e.g. quasi-fixed employment costs, wages). Moreover, if a worker is absent, the firm cannot learn about the workers' productivity and, hence, the probability to assign him to a higher level declines (Pfeifer, 2007)[2]:

H3. Workers at a higher hierarchical level are less absent.

3. Data, variables, and descriptive statistics

The data set was extracted from computerised personnel records of a large German limited company that produces innovative products for the world market. The company has a works council and is subject to an industry wide collective contract. The personnel records contain information on all employees in the company's headquarter on a monthly basis from January 1999 to December 2005. The subsequent empirical analyses focus on fulltime white-collar workers, who are the majority of the firm's workforce. Part-time employees (less than the regular 35 hours per week) are excluded because they might have other reasons for being absent (e.g. family responsibility, more than one part-time job) or have already adjusted the number of contractual working hours to their optimal level. Moreover, part-time employment allows a better balance of working and private life. The exclusion of blue-collar workers is based on the consideration that medical reasons might play a more important role for being absent in production work (e.g. injuries at work, lower degrees of an injury or a disease already lead to an inability to work), which cannot be attributed to shirking behaviour. Furthermore, apprentices, trainees, employees in early retirement schemes, and employees who are absent on a permanent basis (e.g. parental leave) are excluded from the sample. All in all, 62,774 monthly observations of 1,187 white-collar workers remain in an unbalanced panel.

The collective contract contains hierarchical levels that are defined using task descriptions and qualifications needed to execute tasks on the job. Whereas new entrants are largely assigned to hierarchical levels according to their formal education, insiders can move up the hierarchy due to on-the job learning. The highest level (level 6) consists of non-pay-scale employees who are not subject to collective agreements ("aussertariflich") and can be associated with upper management positions. Table I presents a further description of the hierarchical levels and descriptive statistics about levels, wages, and absenteeism. Task complexity and autonomy as well as average hourly wages are larger at higher levels. Hourly wages are computed by dividing each

Table I.
Definition of hierarchical levels and descriptive statistics

	Total number of monthly observations	Mean number of employees	Mean hourly wage (euros)	Wage quartiles 25%	50%	75%	Relative frequency of monthly absenteeism	Mean monthly days absent (total)	Mean monthly days absent (restricted[a])
Level 1: easy tasks (no formal education necessary)	5,557	70	14.59	13.32	14.47	15.58	0.18	0.69	3.91
Level 2: medium-complex tasks (three-year apprenticeship)	13,384	169	18.59	17.08	18.61	19.94	0.16	0.66	4.14
Level 3: complex tasks (college degree)	16,208	206	21.73	20.30	21.65	22.99	0.13	0.48	3.79
Level 4: complex tasks with decisions in own field of duty (university degree)	9,674	122	24.97	23.54	24.84	26.37	0.11	0.46	4.07
Level 5: very complex tasks with decisions of broader importance (university degree)	7,316	93	28.29	27.00	28.32	29.62	0.12	0.43	3.57
Level 6: upper management, non-pay-scale (not subject to collective contract)	10,635	127	34.52	29.95	32.25	36.07	0.08	0.32	3.94
Total	62,774	787	23.86	21.91	23.43	25.19	0.13	0.50	3.93

Notes: Observation period is January 1999 to December 2005; Total number of white-collar workers during this period is 1,187; [a]Restricted: conditional on being absent

worker's monthly gross income in Euros by his monthly working hours. Hourly wages increase with levels and the wage quartiles show a sizeable within level variation of wages. On average 13 percent of all white-collar workers in the sample are at least one day absent during one month. Whereas the frequency is 18 percent among workers at level one, it is only 8 percent at level six.

Probit and Tobit models are estimated to analyse workers' probability (monthly days absent larger than zero) and length (number of monthly days absent) of being absent during a given month. As repeated observations per individual are not independent, standard errors are clustered on panel ID. The variables of interest in the subsequent analyses are absolute wages in Euros, relative wages[3] in percent ($100 \times$ [individual wage of worker i in month t/average wage at worker i's level in month $t-1$]), dummies for hierarchical levels, and dummies for wage quartiles at these levels. The formal educational degree (high school, university, and less than high school as reference group), a female dummy, age and tenure in years as well as their squared terms are used as control variables. Since absenteeism seems largely affected by seasonal factors (e.g. flu, vacations) and to control for aggregate factors (e.g. unemployment), month dummies are included. Table II presents descriptive statistics of the variables.

4. Econometric results

The marginal effects on the predicted probability of being absent at the means of all covariates are estimated using Probit models. The first specification in Table III

	Mean	Standard deviation	Minimum	Maximum
Monthly absenteeism (dummy)	0.1273	0.3333	0.0000	1.0000
Monthly days absent	0.4999	1.9230	0.0000	23.0000
Hourly wage in Euros	23.8600	7.0918	8.7356	83.3333
Squared hourly wage/100	6.1959	4.3644	0.7631	69.4445
Relative wage at level in percent[a]	0.0000	12.1329	−55.1413	131.0405
Squared relative wage/100	0.4757	5.8436	−30.4056	171.7160
Relative wage in percent (positive)	4.2675	8.9032	0.0000	131.0405
Squared relative wage (positive)/100	0.9739	5.6802	0.0000	171.7160
Relative wage in percent (negative)	−4.2675	5.6220	−55.1413	0.0000
Squared relative wage (negative)/100	−0.4982	0.9556	−30.4056	0.0000
Level 2 (dummy)	0.2132	0.4096	0.0000	1.0000
Level 3 (dummy)	0.2582	0.4376	0.0000	1.0000
Level 4 (dummy)	0.1541	0.3611	0.0000	1.0000
Level 5 (dummy)	0.1165	0.3209	0.0000	1.0000
Level 6 (dummy)	0.1694	0.3751	0.0000	1.0000
High school degree (dummy)	0.1476	0.3547	0.0000	1.0000
University degree (dummy)	0.3775	0.4848	0.0000	1.0000
Female (dummy)	0.2150	0.4108	0.0000	1.0000
Age in years	42.4135	9.6258	18.6603	65.9753
Age squared	1891.5580	819.6287	348.2058	4352.7460
Tenure in years	13.7323	9.6973	0.0055	48.2000
Tenure squared	282.6129	329.1557	0.0000	2323.2400

Table II.
Descriptive statistics of variables

Notes: Number of observations is 62,774 for 84 months; Total number of white-collar workers in the sample is 1,187; [a]Relative wages are calculated: relative wage $= 100 \times$ ((individual wage of worker i in t/average wage at worker i's level in $(t-1)$

	(1)	(2)	(3)	(4)	(5)	(6)
Hourly wage in Euros	−0.0086***		−0.0060*			
	(0.0020)		(0.0032)			
Squared hourly wage/100	0.0082***		0.0061*			
	(0.0029)		(0.0038)			
Relative wage in percent[a]				−0.0009**		
				(0.0004)		
Squared relative wage/100				0.0009		
				(0.0008)		
Relative wage in percent (positive)					−0.0016**	
					(0.0008)	
Squared relative wage (positive)/100					0.0016	
					(0.0010)	
Relative wage in percent (negative)					−0.0006	
					(0.0011)	
Squared relative wage (negative)/100					0.0049	
					(0.0050)	
Wage quartile 2 at level (dummy)						0.0016
						(0.0067)
Wage quartile 3 at level (dummy)						−0.0041
						(0.0076)
Wage quartile 4 at level (dummy)						−0.0179**
						(0.0081)
Level 2 (dummy)		−0.0133	−0.0023	−0.0179	−0.0160	−0.0171
		(0.0120)	(0.0136)	(0.0120)	(0.0124)	(0.0121)
Level 3 (dummy)		−0.0354***	−0.0154	−0.0405***	−0.0393***	−0.0395***
		(0.0121)	(0.0160)	(0.0122)	(0.0125)	(0.0123)
Level 4 (dummy)		−0.0449***	−0.0187	−0.0504***	−0.0495***	−0.0495***
		(0.0127)	(0.0202)	(0.0124)	(0.0126)	(0.0125)
Level 5 (dummy)		−0.0366**	−0.0020	−0.0432***	−0.0428***	−0.0422***
		(0.0138)	(0.0242)	(0.0136)	(0.0138)	(0.0138)
Level 6 (dummy)		−0.0725***	−0.0355	−0.0801***	−0.0763***	−0.0776***
		(0.0120)	(0.0236)	(0.0124)	(0.0131)	(0.0121)
Predicted probability at means	0.1208	0.1206	0.1205	0.1205	0.1204	0.1205
Sample mean	0.1273	0.1273	0.1273	0.1273	0.1273	0.1273
Pseudo R^2	0.0284	0.0289	0.0293	0.0294	0.0296	0.0296

Notes: Heteroskedastie robust standard errors clustered on panel ID in parentheses; Significant at 10 per cent; **Significant at 5 per cent; ***Significant at 1 per cent; Number of total observations is 62,774 for 84 months; All estimates control for educational degrees, gender, age, age squared, tenure, tenure squared, and month; [a]Relative wages are calculated: relative wage = 100 × ((individual wage of worker i in t/average wage at worker i's level in $(t-1)$

Table III.
Probit estimates (marginal effects on predicted probability of being absent at means of covariates)

contains the absolute wage, its squared term, and the control variables (educational degrees, gender, age, age squared, tenure, tenure squared, and month)[4]. An increase of the absolute hourly wage from the average wage ($w_M = 23.86$) by €1 decreases the probability of monthly absenteeism on average by 0.47 percentage points[5]. Because of the significant and positive squared wage effect, the total effect is diminishing. For example, a €10 wage increase from the average wage does not decrease the probability by 4.7 percentage points ($10 \times (-0.47)$) but by only 3.95 percentage points.

Specification (2) includes only the hierarchical levels and control variables. The marginal effects are significant and negative, i.e. workers not working at level one are less likely to be absent. Except for level five, the effects are larger for the next higher level. The strongest effect is estimated for level six. Workers at level six are on average 7.25 percentage points less likely to be absent compared to workers at level one. Since the levels might also cover wage effects, specification (3) includes both. Whereas wages and levels still have negative effects as expected, the separate effects are substantially smaller and of lower significance than in the previous estimates. An hourly wage rise of 1 (10) Euro has a marginal effect of minus 0.31 (minus 2.54) percentage points and the marginal effect of level six is minus 3.55 percentage points. The results of specifications (1), (2), and (3) support the view that absolute wages as well as hierarchical levels reduce the probability of being absent. However, the results of specification (3) might also be interpreted in a different way: workers with ceteris paribus higher absolute wages than workers at the same level are less likely to be absent. This interpretation already gives some hint for the negative impact of relative wages, on which the focus relies in the next specifications.

The variable of interest in specification (4) is the worker's relative wage at his level measured as percent deviation from the level's average wage. This measure of relative wages is close to a normal distribution with a mean of zero. The effect of the relative wage is significant and negative, whereas its squared term is positive but not significant. A worker, who earns 1 (10) percent more than the average wage at his level, is 0.09 (0.82) percentage points less likely to be absent. Since the size of the effects of a positive and a negative deviation from the level's average wage might differ, specification (5) treats them separately. It can be seen that the effects of negative relative wage positions are smaller and not even significant, while the effects of positive relative wages are quite strong. For example, a deviation from the level's average wage by plus 1 (10) percent decreases the probability by 0.16 (1.46) percentage points, whereas a deviation by minus 1 (10) percent increases the probability by only 0.06 (0.16) percentage points. Specification (6) includes wage quartiles at the levels to validate the findings about relative wages. As can be seen, workers in a level's second or third wage quartile are not significantly less likely to be absent than workers in the first quartile. However, workers in the fourth wage quartile are 1.79 percentage points less likely to be absent compared to co-workers at the same level, who are in the first wage quartile.

Table IV displays the results of the Tobit estimates which confirm the results of the Probit estimates. For a quantitative interpretation, the marginal effects on the predicted monthly number of days absent conditional on being absent at the means of all covariates ($(E(y|x,y > 0)/(x)$ are computed and presented in Table V[6]. The marginal effects in Table V show that considering specification (1) an hourly wage increase by 1 (10) Euro decreases the monthly number of days absent on average by

Table IV.
Tobit estimates (coefficients = marginal effects on latent variable)

	(1)	(2)	(3)	(4)	(5)	(6)
Hourly wage in euros	−0.3277***		−0.1852			
	(0.0756)		(0.1218)			
Squared hourly wage/100	0.3080***		0.1794			
	(0.1067)		(0.1446)			
Relative wage in percent[a]				−0.0272*		
				(0.0164)		
Squared relative wage/100				0.0240		
				(0.0299)		
Relative wage in percent (positive)					−0.0516*	
					(0.0296)	
Squared relative wage (positive)/100					0.0480	
					(0.0381)	
Relative wage in percent (negative)					−0.0160	
					(0.0422)	
Squared relative wage (negative)/100					0.1407	
					(0.1857)	
Wage quartile 2 at level (dummy)						0.0908
						(0.2578)
Wage quartile 3 at level (dummy)						−0.0937
						(0.2920)
Wage quartile 4 at level (dummy)						−0.5857*
						(0.3264)
Level 2 (dummy)		−0.5097	−0.1530	−0.6685	−0.6058	−0.6391
		(0.4731)	(0.5183)	(0.4783)	(0.4907)	(0.4811)
Level 3 (dummy)		−1.5039***	−0.8174	−1.6909***	−1.6505***	−1.6500***
		(0.5062)	(0.6418)	(0.5178)	(0.5277)	(0.5207)
Level 4 (dummy)		−1.9351***	−0.9681	−2.1636***	−2.1312***	−2.1202***
		(0.6077)	(0.8554)	(0.6109)	(0.6183)	(0.6122)
Level 5 (dummy)		−1.7274***	−0.5057	−1.9958***	−1.9839***	−1.9458***
		(0.6313)	(0.9447)	(0.6483)	(0.6539)	(0.6526)
Level 6 (dummy)		−3.4087***	−1.8469*	−3.7654***	−3.5790***	−3.6449***
		(0.6472)	(1.0708)	(0.6966)	(0.7225)	(0.6721)
Pseudo R^2	0.0154	0.0158	0.0159	0.0160	0.0161	0.0160

Notes: Heteroskedastic robust standard errors clustered on panel ID in brackets; *Significant at 10 per cent; **Significant at 5 per cent; ***Significant at 1 per cent; Number of total observations is 62,774 for 84 months; uncensored observations 7,990, left-censored observations 54,784; All estimates control for educational degrees, gender, age, age squared, tenure, tenure squared, and month; [a]Relative wages are calculated: relative wage = 100 × ((individual wage of worker i in t/ average wage at worker i's level in $(t-1)$

Table V.
Tobit estimates (marginal effects on predicted days absent conditional on being absent at means of covariates)

	(1)	(2)	(3)	(4)	(5)	(6)
Hourly wage in Euros	−0.0588***		−0.0332			
	(0.0136)		(0.0220)			
Squared hourly wage/100	0.0553***		0.0322			
	(0.0192)		(0.0260)			
Relative wage in percent[a]				−0.0049*		
				(0.0029)		
Squared relative wage/100				0.0043		
				(0.0054)		
Relative wage in percent (positive)					−0.0093*	
					(0.0053)	
Squared relative wage (positive)/100					0.0086	
					(0.0068)	
Relative wage in percent (negative)					−0.0029	
					(0.0076)	
Squared relative wage (negative)/100					0.0252	
					(0.0333)	
Wage quartile 2 at level (dummy)						0.0163
						(0.0464)
Wage quartile 3 at level (dummy)						−0.0168
						(0.0522)
Wage quartile 4 at level (dummy)						−0.1040*
						(0.0573)
Level 2 (dummy)		−0.0906	−0.0274	−0.1184	−0.1074	−0.1132
		(0.0833)	(0.0925)	(0.0836)	(0.0860)	(0.0842)
Level 3 (dummy)		−0.2632***	−0.1447	−0.2949***	−0.2880***	−0.2880***
		(0.0867)	(0.1121)	(0.0881)	(0.0898)	(0.0887)
Level 4 (dummy)		−0.3315***	−0.1697	−0.3686***	−0.3632***	−0.3615***
		(0.0993)	(0.1464)	(0.0988)	(0.1001)	(0.0992)
Level 5 (dummy)		−0.2960***	−0.0895	−0.3395***	−0.3375***	−0.3314***
		(0.1035)	(0.1650)	(0.1048)	(0.1058)	(0.1058)
Level 6 (dummy)		−0.5665***	−0.3176*	−0.6208***	−0.5923***	−0.6024***
		(0.1000)	(0.1766)	(0.1058)	(0.1106)	(0.1027)
Predicted days absent at means	3.9914	3.9886	3.9879	3.9877	3.9874	3.9875
Sample mean	3.9274	3.9274	3.9274	3.9274	3.9274	3.9274

Notes: Results are obtained from Tobit estimates in Table IV; Marginal effects conditional on being uncensored: $(E(y|x,y > 0)/(x)$; Heteroskedastic robust standard errors clustered on panel ID in parentheses; *Significant at 10 per cent; **Significant at 5 per cent; ***Significant at 1 per cent; [a]Relative wages are calculated: relative wage = 100 × ((individual wage of worker i in t/average wage at worker i's level in $(t-1)$

0.03 (0.27) days. Specification (2) indicates that employees at higher levels are less absent, except for level five. For example, employees at level six are on average 0.57 days less absent than workers at level one. In the combined estimate of wages and levels in specification (3), both effects are smaller again. A wage increase by 1 (10) Euro decreases the number of days absent by 0.02 (0.15) and the marginal effect of level six is minus 0.32 days. Specification (4) shows that a relatively higher wage of 1 (10) percent is associated with 0.005 (0.05) days less absenteeism. In the separated analysis of positive and negative deviations from the average pay in specification (5), a positive relative wage of 1 (10) percent decreases absenteeism by 0.01 (0.09) days. Negative relative wages, however, have much smaller effects and are not significant. Moreover, specification (6) shows again that only workers in the fourth wage quartile of a level are significantly less absent, namely 0.10 days.

5. Conclusion

The econometric analysis of monthly absenteeism in a German company provides evidence that workers are less absent if they enjoy a higher absolute wage, a higher relative wage, and are employed at a higher hierarchical level. Overall, the results do not only point to the importance of absolute compensation but also to the importance of status related job characteristics like the relative wage position and the hierarchical level (e.g. title, autonomy). An interesting finding is that a positive deviation from the level's average wage has a larger impact than a negative deviation which is not even significant.

One explanation for this finding might be that due to a self-enhancement motive workers make downward comparisons in order to make themselves feel better (Falk and Knell, 2004). Consequently, workers with a lower wage rank do not feel underpaid and, hence, do not react with more absenteeism. A contrary effect, when choosing the reference group, is the motive of self-improvement. This motive implies that workers make upward comparisons and choose higher reference standards to improve their own performance, which would also lead to less absenteeism or at least not to more absenteeism. In addition to these psychological considerations, the non-negative reciprocal behaviour might also be explained by an efficiency wage argument. Since the analysed company pays wages above the union bargained wages, the outside options of the company's workforce might be worse so that workers have incentives not to shirk and not to be absent even if they obtain a lower rank in the wage hierarchy.

Another status-related explanation follows the model of Frank (Frank, 1984a, b; Schaubroek, 1996). Workers are not paid according to their marginal product because they have different preferences concerning their relative wage positions. Workers at the lower tail of the wage distribution are paid above their marginal product and workers at the upper tail of the wage distribution are paid less than their marginal product. The line of reasoning for this kind of wage structure is that workers at the upper tail gain utility from their higher relative wage position, while workers at the lower tail are compensated for their loss in status. Workers at the lower tail of the wage distribution have lower preferences towards status because they could have moved to another firm with a different wage structure, in which they are at the upper tail. Therefore, they have no incentive to be more absent than workers at the upper tail. Conversely, workers at the upper tail of the wage distribution might provide more work effort because they could lose their status if they have to move to a different wage structure.

From the findings it follows that an unequal wage structure has the benefit that relatively better paid workers are less absent, while the costs of higher absenteeism of workers at the lower tail of the wage distribution are rather low. However, since the returns to higher wages and, consequently, the gains from a steeper and more unequal wage structure are diminishing, efficient wage inequality is limited[7].

Notes

1. This is partly due to the institutional arrangement that absence usually has to be medically certified not until the fourth day.
2. Note that such selection effects might interfere with a causal status interpretation of hierarchical levels.
3. An advantage of using ratios instead of absolute differences of wages is the following: consider a collective agreed wage increase for every worker by 10 per cent. Such an increase for everyone would also increase the absolute wage differences by 10 per cent even though the relative wage positions have not changed at all. The ratios, however, stay constant. For example, if worker *i* earned €10 before the wage increase, he earns €11 after the wage increase. If the average wage at worker *i*'s level was €8, it is €8.80 after the wage increase. The absolute differences are, therefore, €2 before and €2.20 after the wage increase, which misleadingly implies a better relative wage position of worker *i*. In fact, the relative wage position has not changed because everyone earns 10 per cent more. The ratios cover this issue correctly because worker *i* earned 25 per cent (10/8) more than the average worker at his level before the wage increase and still earns 25 per cent (11/8.80) more than his co-workers after the wage increase.
4. Throughout all regressions, high school and university degrees have a negative effect on absenteeism, whereas female and older workers as well as workers with longer tenure are more likely to be absent. Since some month dummies are highly significant, aggregated and seasonal factors play an important role. The complete regression results can be requested from the author.
5. Note that the reported marginal effects are absolute values, i.e. they indicate the absolute change in the probability. A quite small absolute marginal effect of 1 percentage point (0.01) is a sizeable relative marginal effect of more than 8 per cent ($0.01/0.12 = 0.08$).
6. For a discussion of marginal effects in the Tobit model see McDonald and Moffitt (1980). Note that the probability of being uncensored was already estimated in the Probit models. The marginal effects on the probability in the Tobit models have approximately the same size as in the Probit models. Even though the reported absolute marginal effects conditional on being uncensored are small at first glance, the relative marginal effects are quite sizeable. For example, an absolute marginal effect of 0.4 days is a relative marginal effect of 10 per cent ($0.4/4.0 = 0.1$).
7. Freeman and Gelber (2006) find an inverse u-shaped relationship between output and inequality in tournament experiments, which also indicates the limitation of wage inequality. Furthermore, the wage structure in the model of Frank (1984a, b) cannot be steeper than the wage structure if individual wages equal individual marginal productivity.

References

Adams, J.S. (1965), "Inequity in social exchange", *Advances in Experimental Social Psychology*, Vol. 2, pp. 267-99.

Akerlof, G.A. (1982), "Labor contracts as partial gift exchange", *Quarterly Journal of Economics*, Vol. 97 No. 4, pp. 543-69.

Akerlof, G.A. and Yellen, J.L. (1990), "The fair wage-effort hypothesis and unemployment", *Quarterly Journal of Economics*, Vol. 105 No. 2, pp. 255-83.

Allen, S.G. (1981a), "An empirical model of work attendance", *Review of Economics and Statistics*, Vol. 63 No. 1, pp. 77-87.

Allen, S.G. (1981b), "Compensation, safety, and absenteeism: evidence from the paper industry", *Industrial and Labor Relations Review*, Vol. 34 No. 2, pp. 207-18.

Allen, W.D. (1996), "Family illness and temporary work absence", *Applied Economics*, Vol. 28, pp. 1177-80.

Barmby, T.A. and Gesine, S. (2000), "Worker absenteeism: why firm size matters", *Manchester School*, Vol. 68 No. 5, pp. 568-77.

Barmby, T.A. and Treble, J.G. (1991), "Absenteeism in a medium-sized manufacturing plant", *Applied Economics*, Vol. 23, pp. 161-6.

Barmby, T.A., Orme, C.D. and Treble, J.G. (1991), "Worker absenteeism: an analysis using microdata", *Economic Journal*, Vol. 101 No. 405, pp. 214-29.

Barmby, T.A., Orme, C.D. and Treble, J.G. (1995), "Worker absence histories: a panel data study", *Labour Economics*, Vol. 2, pp. 53-65.

Barmby, T.A., Sessions, J.G. and Treble, J.G. (1994), "Absenteeism, efficiency wages and shirking", *Scandinavian Journal of Economics*, Vol. 94 No. 4, pp. 561-6.

Brown, G.D.A., Gardner, J., Oswald, A.J. and Qian, J. (2008), "Does wage rank affect employees' wellbeing?", *Industrial Relations*, Vol. 47 No. 3, pp. 355-89.

Brown, S. (1994), "Dynamic implications of absence behaviour", *Applied Economics*, Vol. 26, pp. 1163-75.

Brown, S. and Sessions, J.G. (1996), "The economics of absence: theory and evidence", *Journal of Economic Surveys*, Vol. 10 No. 1, pp. 23-53.

Charness, G. and Kuhn, P. (2007), "Does pay inequality affect worker effort? Experimental evidence", *Journal of Labor Economics*, Vol. 25 No. 4, pp. 693-723.

Chaudhury, M. and Ng, I. (1992), "Absenteeism predictors: least squares, rank regression, and model selection results", *Canadian Journal of Economics*, Vol. 25 No. 3, pp. 615-35.

Clark, A.E. and Oswald, A.J. (1996), "Satisfaction and comparison income", *Journal of Public Economics*, Vol. 61, pp. 359-82.

Clark, A.E., Frijters, P. and Shields, M.A. (2007), "Relative income, happiness and utility: an explanation for the Easterlin paradox and other puzzles", *Economic Journal*.

Clark, A.E., Masclet, D. and Villeval, M.-C. (2006), "Effort and comparison income: experimental and survey evidence", IZA discussion paper No. 2169, Bonn.

Dohmen, T., Falk, A., Huffman, D. and Sunde, U. (2006), "*Homo reciprocans*: survey evidence on prevalence, behaviour and success", IZA discussion paper No. 2205, Bonn.

Drago, R. and Wooden, M. (1992), "The determinants of labor absence: economic factors and workgroup norms across countries", *Industrial and Labor Relations Review*, Vol. 45 No. 4, pp. 764-78.

Dunn, L.F. and Youngblood, S.A. (1986), "Absenteeism as a mechanism for approaching an optimal labor market equilibrium: an empirical study", *Review of Economics and Statistics*, Vol. 68 No. 4, pp. 668-74.

Easterlin, R.A. (1995), "Will raising the incomes of all increase the happiness of all?", *Journal of Economic Behavior and Organization*, Vol. 27, pp. 35-47.

Falk, A. and Knell, M. (2004), "Choosing the Joneses: endogenous goals and reference standards", *Scandinavian Journal of Economics*, Vol. 106 No. 3, pp. 417-35.

Fehr, E. and Gächter, S. (2000), "Fairness and retaliation: the economics of reciprocity", *Journal of Economic Perspectives*, Vol. 14 No. 3, pp. 159-81.

Frank, R.H. (1984a), "Interdependent preferences and the competitive wage structure", *RAND Journal of Economics*, Vol. 15 No. 4, pp. 510-20.

Frank, R.H. (1984b), "Are workers paid their marginal products?", *American Economic Review*, Vol. 74 No. 4, pp. 549-71.

Freeman, R.B. and Gelber, A.M. (2006), "Optimal inequality/optimal incentives: evidence from a tournament", NBER working paper no. 12588, Cambridge, MA.

Heywood, J.S. and Jirjahn, U. (2004), "Teams, teamwork and absence", *Scandinavian Journal of Economics*, Vol. 106 No. 4, pp. 765-82.

Leigh, J.P. (1984), "Unionization and absenteeism", *Applied Economics*, Vol. 16, pp. 147-57.

McDonald, J.F. and Moffitt, R.A. (1980), "The uses of Tobit analysis", *Review of Economics and Statistics*, Vol. 62 No. 2, pp. 318-21.

Ose, S.O. (2005), "Working conditions, compensation and absenteeism", *Journal of Health Economics*, Vol. 24, pp. 161-88.

Pfeifer, C. (2007), "Determinants of promotions in an internal labour market: testing implications from tournament theory and efficient allocation of workers", paper presented at the EEA Meeting 2007.

Schaubroek, J. (1996), "Pay status hierarchy and organizational attachment", *Journal of Economic Psychology*, Vol. 17 No. 5, pp. 579-89.

Shapiro, C. and Stiglitz, J.E. (1984), "Equilibrium unemployment as a worker discipline device", *American Economic Review*, Vol. 74, pp. 433-44.

Solnick, S.J. and Hemenway, D. (1998), "Is more always better? A survey on positional concerns", *Journal of Economic Behavior and Organization*, Vol. 37, pp. 373-83.

Tomes, N. (1986), "Income distribution, happiness and satisfaction: a direct test of the interdependent preferences model", *Journal of Economic Psychology*, Vol. 7 No. 4, pp. 425-46.

Watson, R., Storey, D., Wynarczyk, P., Keasey, K. and Short, H. (1996), "The relationship between job satisfaction and managerial remuneration in small and medium-sized enterprises: an empirical test of 'comparison income' and 'equity theory' hypotheses", *Applied Economics*, Vol. 28, pp. 567-76.

Winkelmann, R. (1999), "Wages, firm size and absenteeism", *Applied Economics Letters*, Vol. 6 No. 6, pp. 337-41.

About the author

Christian Pfeifer is Senior Researcher at the Institute of Labour Economics, Leibniz University, Hannover. He can be contacted at: pfeifer@aoek.uni-hannover.de