

Job Satisfaction, Work Environment, and Rewards: Motivational Theory Revisited

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Abstract. A model of job satisfaction integrating economic and work environment variables was developed and used for testing interactions between rewards and work environment hazards. Data came from a representative panel of Danish employees. Results showed that psychosocial work environment factors, like information about decisions concerning the work place, social support, and influence, have significant impacts on the level of job satisfaction. Maximizing rewards did not compensate public employees to an extent that ameliorated the negative effects on job satisfaction of experiencing low levels of any of these factors whereas influence did not impact job satisfaction of private employees.

1. Introduction

Although job satisfaction is not considered an economic variable in itself, several studies in a labour economic context have highlighted that low job satisfaction is a determinant of resignations from the work place; see Akerlof *et al.* (1988), Blank and Diderichsen (1995), Clark *et al.* (1998), and Kristensen and Westergaard-Nielsen (2004). Other studies have shown an impact from job satisfaction on phenomena that are more difficult to observe directly, such as intention to leave the work place (Böckerman and Ilmakunnas, 2005), motivation and absenteeism (Keller, 1983; Tharenou, 1993), and counterproductive behaviour (Gottfredson and Holland, 1990). Work environment has been found to influence labour market outcomes in terms of early retirement (see Lund and Villadsen, 2005), employee long-term absence from work due to illness (see Benavides *et al.*, 2001; Hemmingway *et al.*, 1997; Lund *et al.*, 2005), short-term sickness absence (see Munch-Hansen *et al.*, 2009), and productivity (see Cooper *et al.*, 1996).

Within traditional economic theory, work environment factors have tended to be modelled as job attributes, seen as hazards at work for which compensating wage differentials are to be paid. The theory of compensating wage differentials goes as far back as Adam Smith's book, *Wealth of Nations*, from 1776, where equalizing wage differentials adjust the net advantages of different jobs. This makes it possible to achieve general labour market equilibrium when work places, preferences, and technologies are heterogeneous. Rosen (1986) reviews the various studies on the area and finds evidence of compensating wage differentials especially for physical working conditions, like shift work, heavy, dirty, or dangerous work.

Other studies find no evidence of compensating wages differentials (see Ehrenberg and Smith, 1994) or, in cases where workers do receive compensating wages differences, that the compensation does not reflect their true preferences (see Lanfranchi, 2002).

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According to the theory of compensating wages differentials, the equalization of total compensation is dependent on both perfect mobility of workers and perfect information for workers and firms. Both assumptions are questionable. Mobility may be, at least temporarily, limited by factors such as a high unemployment rate or family ties, restricting job choice to a specific mix of working hours, pay, or location. Likewise, full information regarding working conditions, especially when drawing in psychosocial work factors, cannot be known in advance, but will be experienced only in the actual work situation. Under these circumstances adverse working conditions can have an impact on the level of job satisfaction even if high wages are paid.

The purpose of the present paper is to identify determinants of job satisfaction in a model that contains detailed information on both work environment and economic factors. Moreover, we wish to test if employees report the same level of job satisfaction when exposed to a hazardous work environment in which compensations are maximized, as compared with a non-hazardous work environment in which there are no compensatory rewards. The results from the first analysis are of interest because most previous studies on job satisfaction either do not include all economic variables of interest, and are cross-sectional studies not accounting for unobserved heterogeneity, or include only few work environment factors. The second analysis can supplement the theory of compensating wages differentials by introducing more detailed work environment measures and by testing the capability of rewards to compensate workers for hazards in the work environment to an extent that ameliorates the effects on job satisfaction.

The work environment factors considered are all evidence-based health risks factors, thereby both long-term effects on work ability and health and short-term effects on employee satisfaction and motivation are considered. The data used in this study are a panel of a representative cohort of Danish employees at two points in time, 1995 and 2000. The data set consists of individual assessments of working conditions and socio-economic data for 3,412 employees (when omitting observations with missing response on any of the items analysed here). The data were collected by the National Institute of Occupational Health in Denmark.

2. Theoretical background

Job satisfaction is not an absolute measure but merely an indicator for a range of job characteristics. Using Locke's (1976) definition, job satisfaction is a positive emotional state resulting from the appraisal of one's job and it is worth recalling here that such subjective data are generally viewed with suspicion by economists. Freeman (1978) states that the principal problem in interpreting responses to such questions is that they depend not only on the objective circumstances in which an individual is situated, but also on one's psychological state. Moreover, the level of job satisfaction may also be influenced by ability thus representing unobservable, stable characteristics of individuals. Earlier studies within organizational psychology have shown that the level of job satisfaction varies very little over time, suggesting that it does reflect underlying stable personal dispositions (see Schneider and Dachler, 1978). This has been tested on a cohort of German employees by Dormann and Zapf (2001) in a review on the studies on the alleged stability of job satisfaction. The result was that after controlling for stable working conditions, the stability of job satisfaction diminishes to non-significance, indicating that an underlying dispositional influence on job satisfaction is not direct, but mediated by working conditions. This also suggests that the level of job satisfaction can be changed by organizational measures.

A general and well-known model of job satisfaction was developed by Herzberg (see Herzberg *et al.*, 1959). He found that some job factors could only cause dissatisfaction or short-lasting motivation whereas other factors could invoke long-lasting positive feelings towards the job. If job factors are in fact dual with regard to their effect on job satisfaction, the method used for examining job satisfaction should account for this. If only testing for positive or negative associations between the covariates and job satisfaction, information on the factors being only capable of causing either high job satisfaction or low job satisfaction would most likely be lost. As for the effects of compensatory rewards, this may be essential and consequently separate analyses are undertaken here for the outcome being highly satisfied with the job and the outcome being dissatisfied with the job.

Many of the earlier studies on job satisfaction have made an analytical distinction between the two genders as there consistently has been reported higher job satisfaction for women; see, for example, Sloane and Williams (2000) and Clark (1997). Where Sloane and Williams find that the differences stem from men and women having different types of work, Clark finds that neither different jobs, their different work values, nor sample selection accounts for the gender satisfaction differential. Rather he proposes an explanation based on well-being relative to expectations. A man and a woman with the same jobs and levels of expectations would report identical levels of job satisfaction. But as women's expectations are lower than men's due to having been more attached to work in the home, they will report higher job satisfaction than their male counterparts even given the same working conditions. This hypothesis is supported by the finding that the gender satisfaction differential disappears for the young, the higher educated, professionals and those in male-dominated work places. This can be related to the length of time women have had an established position at the labour market, an issue that has been further exploited in a paper by Kaiser (2005). Here Denmark, Finland, and the Netherlands are the only European countries that do not show significant gender-job satisfaction differences. They argue that the gender-job satisfaction paradox fades out in the process of 'modernizations' of the labour market. This modernization is facilitated if the welfare state as in Scandinavia and, to a certain extent, the Netherlands supports equal opportunities for women and men by means of, for example, kindergartens and homes for the elderly people.

A more recent topic within this line of economic literature is based on the theory that the public sector is likely to attract individuals with high intrinsic motivation to care about the recipients of public service or those who thrive on the social recognition they might receive for contributing to an important mission (Benabou and Tirole, 2006). And although the picture is not fully conclusive, studies have in fact shown that publicly employed workers are less motivated by high pay and place a higher value on the intrinsic rewards than employees within the private sector. They are prepared to work for a lower overall pay level than is the case for private-sector employees because they derive satisfaction from participating in the production of a good of high social value; see, for example, Karl and Sutton (1998) and Houston (2000). Ren (2010) points to that value congruence for organization and employees can strengthen the intrinsic motivation. He also investigates whether value congruence can impact the design of the organization and finds that value congruence is related to employee participation in decision making and autonomy as opposed to control.

Apart from the above discussed differences in the incentive structures in the public and the private sector, there is also a difference in the gender distribution within the two sectors as women tend to be over-represented in the public as well as the non-profit sector. Narcy *et al.* (2008) investigates possible explanations for this and finds that the 'feminization' of the public sector can be explained by the fact that women obtain a higher wage gain from choosing this sector than men do, investigating, among other factors, the social objectives pursued by the

public sector. Also flexible working hours have seemed to attract women. The result in regard to wages was found for Greek data in Demoussis and Giannakopoulos (2007). In Denmark 63.4 per cent of the employees in the public sector are women whereas this figure for the private sector is only 35.1 per cent (OECD, 1997).

According to the previous discussion, a meaningful analytical distinction when studying job satisfaction is between the private and the public sector. Newer studies that have applied this distinction with good results are, for example, Demoussis and Giannakopoulos (2007) and Ghinetti (2007). They use Greek and Italian data, respectively, and the measures are on so-called 'domain satisfactions' representing different facets of the job, instead of a universal measure. Ghinetti examines differences in satisfaction between the private and the public sector in regard to six non-pecuniary job attributes. He finds that public and private employees are equally satisfied on three of the items, that the publicly employed are more satisfied on two items, and one item with mixed results. Using a division on sector, gender differences can be tested by means of interactions effects. In the present paper, we use a division on sector in combination with tests of gender interaction effects.

An often discussed topic in relation to job satisfaction is wage. The general assumption is that higher wage increases job satisfaction, not necessarily because it actually makes you happier in the job, but because a higher wage increases overall utility by increasing total expenditure opportunities. Many studies apply a general job satisfaction measure, which makes it difficult to distinguish the two effects. Furthermore, not only absolute, but also relative wage is considered to be positively correlated to the level of job satisfaction. This is when using the wages of other workers having the same characteristics and type of job for comparison; see, for example, Clark (1996). In the present paper, wage is used as one type of reward along with recognition and future opportunities at the job. In order not to confuse the relationships between the three types of rewards, we use the absolute wage in the present analyses as opposed to relative wages. The job satisfaction measure applied is a general measure of job satisfaction.

Other determinants of job satisfaction often applied in analyses performed within labour economic theory and thus also used in our analyses include education, job tenure, managerial position, the unemployment rate, and marital status and number of children. Tenure and having a leading position have nearly always been found to be positively related to job satisfaction (Clark, 1997). The relationships between job satisfaction, level of education, the unemployment rate, and wages are intertwined and convoluted. Education raises wages and thus job satisfaction. But education also raises expectations with respect to job content and thus the likelihood of experiencing job dissatisfaction. In addition, there is more opportunity for mobility between jobs in the low-wage job market due to fewer matching criteria for taking a job, increasing the likelihood of job satisfaction. Finally, a lower unemployment rate can raise job satisfaction through improved mobility (see Akerlof *et al.*, 1988). Where possible we use the unemployment rate within specific professions (60 per cent in the current sample), otherwise the average unemployment rate is used.

Hours of work have been considered as a measure of the disutility of work whereas utility is increasing with increased leisure time. In Denmark, as well as in many other countries, working hours have to a great extent become a non-divisible good as a result of regulation. Moreover, long working hours can be evident both for workers having a very challenging job and for workers just having too much work, as shown by Kristensen *et al.* (2004). As a result we decided not to use the absolute number of working hours in our analyses and included flexibility of working hours instead.

Although work environment has been used extensively in earlier job satisfaction studies, the present article restricts its focus to factors where there is evidence of negative health outcomes.

A widely used theory within psychosocial work environment research is the demand–control model, elaborated by Karasek (see Karasek and Theorell, 1990). Job demands encompass quantitative job demands, time pressure, and conflicting job demands whereas decision latitude in contrast is a measure of control and composed of level of job discretion and the degree of influence. Workers exposed to high demands and low control have an increased risk for a number of diseases, notably cardiovascular diseases. High job demands in association with low control have also been associated with diseases such as musculoskeletal disorders, psychiatric illness, gastrointestinal illness, cancer, suicide, sleeping problems, and diabetes (see Kristensen, 1996). Later studies (e.g. Johnson and Hall, 1988) have shown that a high level of social support can counteract the negative effects of high job strain.

A more recent theory is the effort–reward imbalance model by Siegrist (1996). High effort in combination with low rewards has been shown to have an impact on stress, sudden cardiac death, and hypertension. In this model job demands are a composite measure of time pressure and other quantitative demands, similar to the demands of the demand–control model. Reward can be in the form of wages, recognition, and opportunities for personal development or career opportunities. In our analyses we integrate all three reward measures in testing if employees report the same level of job satisfaction when exposed to a hazardous work environment in which compensations are maximized, as compared with a non-hazardous work environment in which there are no compensatory rewards.

Job security and predictability are related to the conception of status control. Not having a high level of information on decisions that concern the work place is an invisible stressor that has been found to predict heart disease (see Iversen *et al.*, 1989). In the extensive Whitehall II study set-up in Britain in order to investigate the causes of the social gradient in morbidity and mortality, the impact of privatization on a former civil-servant department when job outcomes were not established was evaluated (see Stansfeld *et al.*, 1997). In the gap between the announcement of the privatization and the termination phase where the employees had gained more certainty about their future job status, there was an increase in the psychiatric morbidity compared with the morbidity in the period before the announcement of the privatization.

Other psychosocial health factors included in the analyses in this paper are being exposed to aggression at the work place and role conflicts. Exposure to conflicts, teasing, or threats of violence can provoke stress, anxiety, and, in the long run, fatigue in the victims (see Hoegh, 2005). Role conflict is a measure of conflicting demands and unclear responsibilities and is considered a source of chronic stress, also shown to have an impact on job satisfaction (Fisher and Gitelson, 1983).

Physical job demands are included using a measure of the frequency of odd working positions, including having the back heavily bent forward with no support for hands or arms, twisted or bent body, hands lifted to shoulder height or higher, the neck heavily bent forward or squatting or kneeling (see Lund and Tsonka, 2003). Noise is measured on a dichotomous scale reflecting if workers are exposed to noise so high that one must raise his or her voice more than 75 per cent of the time in order to communicate with others. For a review of the effects of noise on mental health, see Stansfeld *et al.* (2000).

3. Method

3.1 Elaboration of variables

In this paper the wording of the question on job satisfaction is: ‘Are you satisfied with your job?’. The answers fall in four verbally labelled and ordered categories. Possible answers are:

‘Yes, indeed’, ‘To some extent’, ‘Not so much’, and ‘No or very seldom’. For analytical purposes, answers in the category ‘Yes, indeed’ define the outcome high job satisfaction whereas answers in categories ‘Not so much’ and ‘No or very seldom’ define being dissatisfied with the job.

In general the variables are entered in the model in their original form. However the variable representing high demands in combination with low control, as well as the scale for social support, is composed of several measures. Social support consists of a practical and a psychological dimension, both of which are assessed in the questionnaires. The scales differ slightly from 1995 to 2000 and we have therefore dichotomized in a way that makes them equivalent. Hence we only look at situations where the employee either *always* receives help, support, and encouragement or not. There are separate questions for social support from colleagues and from leaders or superiors. Not always receiving support from either colleagues or superiors is assigned the lowest level, always receiving support from either colleagues or superiors are the two intermediate levels, and always receiving support from both groups is the highest level.

In order to measure demands and level of control, a variable that reflects the demands in different occupations has been constructed. Demands are defined as being high if work demands attention and full concentration almost all of the time, if the pace of work is perceived to be very fast, or when conflicting or unclear job demands are experienced. Low control is defined as a combination of limited influence on planning one’s own work and low job variation.

3.2 Data and the population

Data on work environment and health in the working population were obtained from the Danish Work Environment Cohort Study (DWECS) (see Burr *et al.*, 2003). The panel started out with a simple random sample drawn from the central population register in 1990, consisting of people aged 18–59 years per 1 October 1990. People in this panel were interviewed in 1995, 2000, and 2005 and the panel is continuously adjusted for ageing and immigration. The 1990 sample consisted of 9,653 individuals of which 8,664 participated (90 per cent). Of these, 6,067 (70 per cent) were wages earners. The following 1995 sample consisted of 10,702 persons, of which 8,572 participated (80 per cent). Of the participants in 1995, 5,649 (65.9 per cent) were wage earners, 6.7 per cent were enterprise owners, and 27.4 per cent were not in the job market. Of the 5,649 wage earners in 1995, 4,647 also participated in the survey in 2000 (82.3 per cent).

The population used for the analyses in this paper are the respondents who were wage earners in 1995 and who also participated in DWECS as wage earners in 2000, corresponding to 3,773 individuals. The sample only contains information about present job in 1995 and 2000, respectively, and on tenure in these jobs. Information on possible intervening unemployment spells is only obtainable when linking the data set to a register of social payment transfers that have not been within the scope of this paper.

Job satisfaction has shown to be related to job change as in, for example, Kristensen and Westergaard-Nielsen (2004). As for job change in our population, a total of 1,128 individuals have changed work place in the period. When dividing this subsample on job satisfaction levels as reported in 1995, 49.7 per cent of those who were not, or only very seldom satisfied with the job change work place during the 5-year period whereas only 32.2 per cent of those who were highly or to some extent satisfied with the job have changed job by 2000. Moreover, as wage earners who had a low degree of job satisfaction in 1995 have had a higher

incentive to leave the work force completely or start their own enterprise by 2000, the final sample may be biased. To estimate the size of this potential bias, all participants in 2000 (including unemployed and enterprise owners) are divided among the four categories of job satisfaction levels reported in 1995. The results are that 21 per cent of those who were not, or only very seldom, satisfied are not in the work force in 2000. Of those who were highly or to some extent satisfied with the job, only 14 per cent had left the work force. However, the total amount of dissatisfied workers who have left the sample amounts to 58 persons and attrition should therefore not pose a serious threat to the reliability of results. After deducting observations with missing values on any of the analysed items, the cohort consisted of 3,412 individuals. See Table 1 for sample characteristics.

3.3 Statistical analyses

The data resulting from measuring qualitative phenomena by the use of questionnaires are most often categorical, ordinally scaled data. This means that they are ordered, but with intervals that might be uneven. One example is measures of job satisfaction using a verbal rating scale, consisting of a discrete number of verbally described ordered categories. This type of data restricts the types of arithmetic operations that can be applied, which in turn limit the range of statistical methods suitable for the analysis.

As noted earlier, another problem when analysing job satisfaction is that of unobserved heterogeneity. It causes problems because the regression model is based on the assumption that there is no correlation between the explanatory variables and the error term. But as the error term captures the variation from potentially omitted variables such as fixed personal traits that may influence the probability of a specific outcome on the job satisfaction variable, this type of model error is likely to occur in analyses of job satisfaction.

A method to eliminate heterogeneity is the application of conditional likelihood in logistic regression, as shown by Chamberlain (1980) in the case of having a binary response variable. The principle applied here is that when using logistic regression with conditional likelihood and having more than one observation per object, the variables that do not change values are not used in the estimation. Unfortunately this also means that a variable like gender will be omitted from the estimation. The latter problem can be solved by either splitting up the analysis in two parts according to gender or by integrating gender effects as interaction effects, which is the method adopted in this paper. As the scale on which job satisfaction is measured in the present analysis consists of four ordered categories with verbal ratings, ordinal comparability can be assumed and the response variable can be recoded to a binary variable without violating any assumptions.

Conditional likelihood estimation is performed using the panel 1995–2000. Supplementary ordinary regressions are completed using the cross-sectional data from 2000. Predicted probabilities are generated from the cross-sectional data. Initially, correlation analysis using Kendall Tau was performed on all explanatory variables. The correlation coefficient was below 0.30 except between age and tenure, and between education in years and wage. Tenure is used as a substitute for age, as the sign of the correlation between age and job satisfaction also may depend on age (Clark *et al.*, 1998). Educational levels were dichotomized and tested in the model as with the gender interaction terms.

The full model with variables given in Table 1 and Appendix A becomes:

Table 1. Summary of key demographic and economic variables in balanced panel (N = 3,412)

	1995		2000		1995		2000	
	Private	Public	Private	Public	Private	Public	Private	Public
Age in years								
Mean	35.7	39.7	40.9	44.7	10,891	9,932	13,600	12,123
Years of school					4,909	4,102	4,667	3,541
Mean	12.1	13.3	12.5	13.7				
Std. deviation	2.19	2.57	2.36	2.53	7.0	8.8	9.0	11.4
Professions					7.52	8.10	8.79	9.64
Vocational training	53.5	34.2	54.4	33.7				
Marital status					64.9	36.6	65.0	34.5
Cohabiting	74.7	79.3	80.8	81.9	35.1	63.4	35.0	65.0

$$\begin{aligned}
JS_{ij} = & \alpha_i + \beta_1 \text{married}_{ij} + \beta_2 \text{Children}_{ij} + \beta_3 \text{High school}_{ij} + \beta_4 \text{Short further education}_{ij} \\
& + \beta_5 \text{Tenure}_{ij} + \beta_6 \text{Leader}_{ij} + \beta_7 \text{unemployment rate}_{ij} + \beta_8 \text{Noise}_{ij} \\
& + \beta_9 \text{Physical strain}_{ij} + \beta_{10} \text{Influence}_{ij} + \beta_{11} \text{High demand-low control}_{ij} \\
& + \beta_{12} \text{Job security}_{ij} + \beta_{13} \text{Information}_{ij} + \beta_{14} \text{Role conflict}_{ij} \\
& + \beta_{15} \text{Social support}_{ij} + \beta_{16} \text{Conflict at work}_{ij} + \beta_{17} \text{Flexible hours}_{ij} \\
& + \beta_{18} \text{Logpay}_{ij} + \beta_{19} \text{Job future}_i + \beta_{20} \text{Recognition leader}_i + \varepsilon_{ij}.
\end{aligned}$$

The i subscript refers to different persons and j refers to different measurements for person i , Job satisfaction (JS) is the dependent variable, α the constant, β is the vector of the coefficients of the explanatory variables, and ε_{ij} is a random error term. Questionnaire answers on job future opportunities and recognition from leaders are only available for the 2000 cross-section.

The estimation method is maximum likelihood and the statistical computer programs used were SAS 8.2 and STATA 9.0, the logit procedure and the clogit procedure. Results are presented as factor changes in odds, expressing the increase in the odds of being in the group having a high degree of job satisfaction, for a one point, or level, increase in the explanatory variable.

4. Results

In this section we present the empirical results based on four sets of analyses. (1) Preliminary regression analyses on gender differences. (2) Main results: Estimating the probability of the outcomes being highly satisfied with the job and being dissatisfied with the job using conditional likelihood estimation. (3) An ordinary logistic regression analysis using only data from 2000 with addition of recognition from leaders and future job opportunities to the model. This model is used for predicting the probability of having a high level of job satisfaction when rewards are optimized and work environment factors are at unfavourable levels. (4) A fourth and last analysis has the purpose of validation of the question on job satisfaction and consists of a regression where job satisfaction as response variable is substituted by a question on the degree of motivation and engagement in one's work.

4.1 Preliminary analyses on gender differences

Initially, tests for gender interaction effects are performed. For private-sector employees, social support shows both a significant gender effect and a general effect on job satisfaction. For public-sector employees job security indicates a significant gender effect and a general effect. In both cases being a woman increases the impact on the level of job satisfaction.

The gender interaction effects are verified when running separate regressions on genders still using the division on sectors. The results can be seen in Appendix B. Due to the loss of observations when using fixed effects regressions these regressions are run on only the 2000 cross-section using ordinary logistic regression on the outcome being highly satisfied. A few results turn out to be gender specific: only for publicly employed men, having no education above high school level lowers the probability of a high level of job satisfaction and having a leading position increases the probability of high job satisfaction significantly. For publicly employed women only, the unemployment rate is significantly and inversely related to the level of job satisfaction. Job security is significant as suggested by the found interaction effects. For privately employed men and women, gender-specific effects are influence that increases the

probability of high job satisfaction for men, job security that increases the likelihood of job satisfaction for women, and being exposed to aggression at the work place, which is only significant for women. Moreover, the coefficient of social support is larger for women than for men corresponding to the results of the gender analysis. In regard to wages, the effect is large and positive for both privately employed men and privately employed women but non-significant for both genders within the public sector.

As discussed in the statistical analysis section multicollinearity existed between education in years and wage. Therefore educational levels are entered as separate variables to the model. Ultimately, only having no further education beyond high school and having a short further education were statistically significant ($p < 0.05$) and these levels are therefore kept in the model.

4.2 Results using conditional likelihood on the combined panel of data from 1995 and 2000

The gender interaction effects found and the two variables representing educational level are now entered in the final model. The results are shown in Table 2. The left section of the table shows the results when estimating the probability of having a high level of job satisfaction and the right section of the table shows the results when estimating the probability of having a low level of job satisfaction, the latter in order to test for a duality in the impacts on job satisfaction as discussed in Section 2. Looking first at the results for the economic and demographic measures, the odds of being in the high job satisfaction category are reduced with one-fifth for every additional child for private employees, although the latter effect is only borderline significant ($p = 0.077$). This result is matched in the public sector, in the way that the odds of having a low level of job satisfaction triple for an additional child. For private-sector employees, having no more than a high school education, opposed to having an educational level above high school, nearly triples the odds of being in the high job satisfaction category and also reduces the odds of being in the low job satisfaction category, although the latter effect is only borderline significant ($p = 0.063$). Having a medium length or short further education nearly halves the odds of being highly satisfied with one's job. Educational level does not show any effects of significance for public-sector employees. High tenure raises the odds of being in the low job satisfaction category for public-sector employees, a result not matched elsewhere. Within both sectors, the level of job satisfaction seems to be related to the size of the unemployment rate, and the scope of this relation is similar for private and public employees. The sizes of the odds indicate an 8.3 per cent decrease in the odds of being in the high satisfaction category per per cent increase in the unemployment rate for private-sector employees and a 9 per cent decrease in the odds of being in the high satisfaction category per per cent increase in the unemployment rate for public-sector employees.

In regard to occupational health factors, the public and the private sector have four factors in common: role conflicts nearly halves the odds of being in the high satisfaction category in both sectors, odd work positions decrease the odds of being in the high satisfaction category for private employees by one-third, and for public employees by nearly one-half. Increasing the level of information that concerns the work place raises the odds of being highly satisfied by 71 per cent for privately employed and by 91 per cent for publicly employed workers. For each increase in the level of social support, the odds of being highly satisfied increase by 58 per cent and 31 per cent, respectively.

For public employees, increasing the level of influence increases the odds of being highly satisfied with the job by 71 per cent, and having foreseeable job security above 12 months nearly doubles the odds of being in the high job satisfaction category. For private-sector

Table 2. Results from conditional logistic regression, when estimating the probability of being highly satisfied with one's job and being dissatisfied with one's job. Divided on private-sector and public-sector employees

	High job satisfaction			Low job satisfaction ^c		
	Private (Reg. 1)		Public (Reg. 2)	Private (Reg. 3)		Public (Reg. 4)
	OR fixed	CI	OR fixed	OR fixed	CI	OR fixed
Cohabiting ^a	1.061	0.674–1.672	1.310	1.379	0.360–5.274	0.744
Number of children	0.811(*)	0.643–1.023	1.047	0.803	0.394–1.639	3.396*
High school or less ^a	2.881*	1.342–6.186	0.497	0.062(*)	0.003–1.157	11.731
Short further education	0.558*	0.359–0.868	0.796	0.414	0.085–2.022	2.327
Job tenure in years	1.009	0.978–1.040	0.974	1.046	0.951–1.150	1.195*
Leader status ^a	1.349	0.707–2.573	0.460	3.378	0.320–35.729	0.061
Unemployment rate	0.917*	0.876–0.960	0.910*	1.006	0.906–1.116	1.017
1. Noise ^a	0.525*	0.303–0.907	0.739	3.843*	1.238–11.926	0.358
2. Odd work positions	0.681*	0.514–0.903	0.579*	1.238	0.653–2.347	1.250
3. Influence	1.045	0.849–1.292	1.710*	1.943*	1.176–3.212	3.186(*)
4. Low control–high demand	0.965	0.446–2.091	0.595	4.482*	1.425–14.091	0.727
5. Job security 1 year ^a	1.532	0.904–2.596	2.042(*)	3.012*	1.016–8.933	0.939
6. Information	1.709*	1.380–2.116	1.906*	2.112*	1.222–3.650	2.052(*)
7. Role conflicts ^a	0.537*	0.398–0.723	0.525*	2.247(*)	0.949–5.320	1.152
8. Social support	1.576*	1.257–1.978	1.309*	1.496*	1.059–2.114	1.586(*)
9. Exposed to aggression ^a	0.973	0.555–1.705	0.936	1.825	0.679–4.902	4.557(*)
10. Flexible hours	1.246*	1.103–1.409	1.035	0.913	0.641–1.300	0.805
Monthly pay. Ln kr	1.698(*)	0.990–2.913	1.386	1.176	0.275–5.038	1.766
Male social support ^b	0.755*	0.575–0.992	—	—	—	—
Male job security ^b	—	—	0.150*	—	—	—

^a Dichotomous variables.

^b Gender interaction effects: Male = 1.

^c Scales are reversed for influence, job security, information, social support, and flexible hours when estimating job dissatisfaction. CI: 95% confidence interval. Significance levels:(*) 0.05 < *p* < 0.10, * 0.0000 < *p* < 0.05.

Number of observations: Reg. 1 = 1,200, Reg. 2 = 650, Reg. 3 = 282, Reg. 4 = 128.

–log (Likelihood): Reg. 1 = 317.1, Reg. 2 = 172.6, Reg. 3 = 50.8, Reg. 4 = 27.3.

Pseudo *R*²s: Reg. 1 = 0.24, Reg. 2 = 0.23, Reg. 3 = 0.48, and Reg. 4 = 0.38.

employees, three additional factors have significant impacts on the probability of being highly satisfied with one's job: noise halves the odds of having the highest level of job satisfaction; more flexible working hours increase the odds of being highly satisfied by 25 per cent; and finally the odds of log pay suggest that when log pay is increased by one unit the odds of being in the high satisfaction category increase by nearly 70 per cent. The effect is borderline significant ($p = 0.054$).

Comparing the results from the conditional likelihood estimation with the results from the ordinary logistic regression analyses (as shown in Appendix B), a few discrepancies emerge: for publicly employed men having no more than a high school education lowers the probability of a high level of job satisfaction and having a leading position raises the probability of a high level of job satisfaction using ordinary regression analysis only. Influence raises the probability of high job satisfaction significantly for privately employed men but not when using fixed effects analyses. For public employees, being exposed to aggression at the work place lowers the probability of high job satisfaction when using ordinary logistic regression analysis and the corresponding result from the fixed effects regression is an increase in the probability of dissatisfaction when being exposed to conflicts. For private employees odd work positions only show an effect in the fixed effects analysis.

Looking at the results of predicting being dissatisfied with one's job several factors impact on the probability of both having a high degree of job satisfaction and being dissatisfied with the job. This is the case in the private sector for noise, information, role conflicts, and social support, and in the public sector for influence, information, and social support. On the other hand, being exposed to violence, threats of violence or teasing, or having a job with low control in combination with high demands only has an impact on the probability of being dissatisfied with the job.

4.3 Hazards and the effects of rewards on the likelihood of being highly satisfied with the job

Following the results from the regressions presented in the previous sections, pay is only a significant predictor of having a high level of job satisfaction in the private sector, and did not seem to have any impact on the probability of being dissatisfied. Within both labour economic studies and work psychology, future opportunities and recognition are also considered as rewards of work. As additional information is available on future opportunities and recognition in data from 2000, the following analysis incorporates all three types of rewards.

In addition, people were asked in 1995 what they considered to be the most important aspect of their work. Of the three possible answers, 11.2 per cent answered that the pay was good (6.0 per cent in the public sector and 14.8 per cent in the private sector), 58.0 per cent answered that the work interested them (65.6 per cent in the public sector and 52.7 per cent in the private sector), and 30.8 per cent answered that they got along well with colleagues (28.4 per cent in the public sector and 32.4 per cent in the private sector). The differences among public and private employees with regard to pay support the evidence from our analyses. However the results also suggest that alternative rewards may be considered although the capability of these rewards to compensate for hazards in the work environment is more uncertain.

The second question we have sought to investigate is whether employees exposed to hazards at work for which they receive above average rewards, when comparing with employees in non-hazardous work with average rewards, report the same level of job satisfaction. This was achieved by means of calculations of predicted probabilities. The factors tested were significant predictors of both having a high level of job satisfaction and being dissatisfied with the

job. Initially, a regression on the 2000 cohort integrating recognition from leaders and future possibilities in the model was performed. The results from this regression are shown in Appendix C.

The hazards analysed for private-sector employees are high noise, low levels of information and social support, and role conflicts. For the public sector, low levels of information, influence, and social support are chosen. The results from varying the levels of these variables from their best, to their worst case, and at the same time maximizing the three types of rewards are shown in Table 3.

The values in column 2 express the probability of being highly satisfied with the job when each of the six chosen work environment factors are in their most positive position and all other variables are held constant at the mean. Column 3 shows the probability of being highly satisfied with the job when each of the six hazards is at the most negative level. Columns 4, 5 and 6 give the probability of having a high level of job satisfaction when the individual factors are at the worst case, single rewards are at their best, and all other variables are at their mean.

Having the lowest level of information gives the lowest probability of having a high degree of job satisfaction observed for private-sector employees (0.62). For public-sector employees the likelihood of being highly satisfied with the job when information is at the lowest level is 0.56. This is the case when all other variables are held at an average level. Moreover, the probability of being highly satisfied with one's job never exceeds 0.75 as long as information is low, which is below both 0.81 and 0.79, the average probabilities of being highly satisfied with the job within the public and the private sector.

Low influence predicts the lowest probability of a high level of job satisfaction for public-sector employees, which is 0.56. In this case it is not possible to reach the same level of job satisfaction when having the lowest possible level of influence, as compared with those experiencing a high level of influence even if receiving maximum rewards. The same is evident for social support for employees in both sectors. In contrast, the impacts of high noise or experiencing role conflicts on the probability of having a high level of job satisfaction are, however, neutralized by either the highest level of leader recognition or future opportunities, or a high wage, being among the best-paid 2 per cent in the sample.

4.4 Hazards and the effects of rewards on the likelihood of being highly motivated in the job

The analysis made in Section 4.3 is repeated now predicting the probability of having the highest level of motivation when the levels of influence, social support, and information are at their worst, individual rewards are at their best, and all other variables are at their mean. The results of this regression are shown in Appendix D. Table 4 is analogous with Table 3. The results in Table 4 are consistent with the results in Table 3, except that receiving the highest level of leader recognition now seems to compensate privately employed for a low level of social support.

5. Discussion

The way work environmental and socio-economic factors related to job satisfaction was not only in terms of either increasing job satisfaction or not, i.e. being motivational factors or not. Thus in line with Herzberg *et al.*'s (1959) theory some job factors also function as maintenance factors that are only being capable of making employees dissatisfied with the job. In addition to this, some factors only had the impact of lowering the likelihood of being highly satisfied with the job. These could be characterized as inconvenience factors with an unsettling effect on the motivation factors.

Table 3. Probability of a high level of Job Satisfaction (JS) for varying levels of dissatisfaction factors and rewards (X)

	P(High JS) when X is optimal and the rest of the factors at their means	P(High JS) when X at its worst and the rest of the factors at their means	P(High JS) when Pay is at maximum, X at its worst, and the rest of the factors at the means	P(High JS) when Leader Recognition high, X at its worst, and the rest at the means	P(High JS) when Future Opportunities are high, X at its worst, and the rest at their means
Private sector					
Noise	0.798	0.713	0.804	0.817	0.815
Information	0.825	0.618	0.727	0.743	0.741
Social support	0.881	0.727	0.814	0.827	0.825
Role conflict	0.812	0.736	0.821	0.834	0.832
Public sector					
Information	0.838	0.563	0.520	0.701	0.717
Social support	0.879	0.754	0.721	0.848	0.858
Influence	0.829	0.598	0.556	0.730	0.746

Probability of high Job Satisfaction for *private* employees when all variables at their mean: 0.7901.
Probability of high Job Satisfaction for *public* employees when all variables at their mean: 0.8052.
Leader recognition is at its highest when the employee has answered 'To a very high degree' when asked: 'Is your work acknowledged and appreciated by the management?' and future opportunities are maximized when the employee has answered 'To a very high degree' when asked: 'Are the future prospects of your job good?'.

Table 4. Probability of a high level of motivation (M) for varying levels of dissatisfaction factors and rewards (X)

	P(High M) when X is optimal and the rest of the factors at their means	P(High M) when X at its worst and the rest of the factors at their means	P(High M) when Pay is at maximum, X at its worst, and the rest of the factors at the means	P(High M) when Leader Recognition high, X at its worst, and the rest at the means	P(High M) when Future Opportunities are high, X at its worst, and the rest at their means
Private sector					
Information	0.396	0.268	0.299	0.414	0.356
Social support	0.467	0.320	0.353	0.476	0.415
Public sector					
Information	0.474	0.338	0.380	0.443	0.448
Social support	0.532	0.408	0.453	0.518	0.523
Influence	0.507	0.161	0.187	0.230	0.233

Notes: Motivation is at its highest when the employee has answered 'Yes, indeed' when asked: 'Do you feel motivated and engaged in your work?'; 39.2% of the private employees and 46.3% of the public employees answer 'Yes, indeed'.

While adding to the credibility of results, many respondents unfortunately are lost when using conditional likelihood estimation as those with none changing characteristics are dropped from the analysis. When comparing the results of the ordinary regression analyses with the results using conditional likelihood estimation it did not seem that controlling for fixed effects alters results in regard to the subjective measures used. A possible explanation is that most answers are put as frequencies of exposure during working hours leaving less room for misconceptions of the questions.

About two-thirds of the results on work environment variables were common for public- and private-sector employees, with effects of just about the same size. Common factors were odd work positions and role conflict, both factors lowering the probability of having a high level of job satisfaction, and information on decisions that concerns the work place and social support, of which higher levels predicted being highly satisfied with the job and lower levels predicted job dissatisfaction. Factors being specific for the private sector were noise and a combination of low control and high demands, whereas exposure to aggression at the work place and level of influence only seemed to have an effect on public employees.

Being exposed to violence, threats of violence or teasing, and having a job with low control in combination with high demands are examples of maintenance factors as the extent of their impact is confined to negative outcomes. In accordance with our results, public employees have been shown to have an increased risk of experiencing conflicts, teasing, or threats of violence at work (see Hoegh, 2005) whereas jobs with low control and high demands are typically found on industrial work sites within the private sector.

In testing the ameliorative capability of rewards to compensate for the negative effects on job satisfaction deriving from exposure to (primarily psychosocial) hazards in the work environment, our results indicated only a limited effect for this type of compensating differential. In particular, rewards could not neutralize the effects on job satisfaction when employees have low levels of information on decisions that concerns the work place, social support, or, as a result for public employees only, influence. Most previous studies searching for evidence of compensating wage differentials for work environment hazards have been concerned with observable occupational health hazards (see Rosen, 1986), an exception being for very stressful work (French and Dunlap, 1998).

The results were duplicated and even more pronounced when the analysis was repeated substituting job satisfaction with motivation. Where the same fraction of public employees and private employees reported being highly satisfied with the job, there was a discrepancy among the two sectors when comparing the fraction of employees reporting to be highly motivated. Thirty-nine per cent of the private employees and 46 per cent of the public employees reported to be the highly motivated. These results also correspond to the result that more public than private employees report that the most important aspect of their work was that the work interested them (66 per cent versus 53 per cent). The differences are small but the results support the theory that public employees should have higher intrinsic motivation (Benabou and Tirole, 2006). As wages did not show any significant impact on the level of job satisfaction for public employees and neither had any significant compensating value in regard to certain hazards at the job, the results also point to that publicly employed workers are less motivated by high pay and place a higher value on the intrinsic rewards as also seen in Karl and Sutton (1998) and Houston (2000).

Very low probabilities of having a high level of job satisfaction (0.56) and being highly motivated at the job (0.16) were evident for public employees with the lowest level of influence. This clearly suggests that lack of influence can demotivate public employees and points to that

intrinsic motivation can be undermined if people feel controlled, and have little autonomy and freedom in performing work tasks (Deci and Ryan, 1985). Moreover, in the long run, lack of autonomy can pose a threat to value congruence between the employees and the organization, as suggested by Ren (2010).

In regard to the results concerning gender differences, job security showed a general positive effect on job satisfaction as well as a gender-specific effect for employees in the public sector, suggesting women pursue job security more than men. For private employees, any effect of job insecurity would be dissatisfaction with the job and the size of the effect was just about the same for the two genders. In a study by D'Addio *et al.* (2003), job security was found to have the same effect for men and women after adjusting for fixed effects. Without adjusting for fixed effects, men seemingly valued job security the most. In the study by Clark *et al.* (1998), they find that the extent to which women or men pursue job security varies among countries and that the differences are relatively small. These other studies have split the analyses on gender, which complicates comparison, and the differing time span of years over which the observations are made most likely has an effect too. Clark *et al.* (1998) also find that women report having good relations at work more often than men. Whereas Sloane and Williams (2000) find that good interpersonal relations are most important for women. This is consistent with our finding that among private employees, women value social support more than men.

The impact on job satisfaction from wages may also reflect an effect of satisfaction with the job that derives from increased total expenditure opportunities as the question on job satisfaction in our study is one that reflects overall job satisfaction. The results may also be dependent on the given wage structure as both wages and wages dispersion are lower within the public sector than within the private sector in Denmark at the time (Wadensjö, 1996).

Finally, the impact on job satisfaction from the unemployment rate is large. D'Addio *et al.* (2003) found a similar negative correlation between job satisfaction and the rate of unemployment. In both the study by D'Addio *et al.* (2003) and our study, this relation is only significant after controlling for fixed effects. That is, apart from the result when making a separate analysis on gender and sector. It is noteworthy that the unemployment rate has these clear derived effects on the subjective feelings towards the job. According to the studies by Akerlof *et al.* (1988), a low unemployment rate makes it possible for unsatisfied employees to change to jobs with more desired characteristics.

Appendix A: List of work environment variables

1. Noise: Two levels according to answer to the below:

3/4 or more of the work day being exposed to noise that high that one must raise the voice to be able to speak with others.

2. Odd work positions: A score with a one point increase when respondents have marked a positive answer to the following questions: 3/4 or more of the working hours the work entails work with:

1. The back heavily bended forward with no support for hands or arms.
2. The body twisted or bended in the same way several times an hour.
3. The hands lifted to shoulder height or higher.
4. The neck heavily bended forward.
5. Squatting or kneeling.

3. Influence: Four levels; Can you plan your own work?

4. Low control–high strain:

Influence: Four levels; Can you plan your own work?

Job variation: Four levels; Is your job varied?

Time pressure: Recoded into two levels;

1995: Does your work entail that you have to work under time pressure in order to get certain pieces of work done?

2000: Is it necessary to work very fast?

Mental demands: Does your work demand all your attention and concentration?

5. Job security: Two levels according to:

(1995): Certain or pretty sure of keeping the job the next 12 months.

(2000): The present job is not a fixed-term appointment with less than 12 months left.

6. Information: Four levels; Are you informed about decisions that concern your work place?

7. Unclearness of role and conflicting demands: Two levels according to the consent or not of either of two statements:

It is clear what my responsibility.

I experience conflicting demands in my work.

8. Social support: (four levels — No support, always support from colleagues but not always from superiors, always support from superiors but not always from colleagues, always support from colleagues and superiors)

1995: Do you receive help and encouragement from your superior/colleagues?

2000: How often do you receive help and support from superior or colleagues?

9. Conflicts, teasing, unwanted sexual attention, threats, or violence (two levels):

1995: Are you exposed to any form of unpleasant teasing, unwanted sexual attention, threats of violence, or violence at your work place? (Not reporting any incidents constitutes a 'no')

2000: Have you been exposed to unpleasant teasing, unwanted sexual attention, threats of violence, or physical violence at your work place within the last 12 months? (Not reporting any incidents constitutes a 'no')

10. Flexibility of work schedule: Four levels according to the time space within a respondent can vary the daily working schedule without giving further notice.

Can you change the placing of your working hours from day to day without making prearrangements, e.g. meet at work late or leave work early?

11. Recognition: Four levels:

Is your work acknowledged and appreciated by the management?

12. Future opportunities: Four levels:

Are the future prospects of your work good?

Appendix B: Estimating high job satisfaction on the 2000 cross-sectional data. Divided on gender

	Men				Women			
	Private (Reg. 1)		Public (Reg. 2)		Private (Reg. 3)		Public (Reg. 4)	
	Coef.	Standard error	Coef.	Standard error	Coef.	Standard error	Coef.	Standard error
Cohabiting ^a	0.258	0.1896	0.1700	0.2248	0.307	0.2327	0.167	0.1477
Number of children	-0.067	0.0728	-0.078	0.0860	-0.026	0.1004	-0.015	0.0612
High school or less ^a	0.237	0.1999	-0.638*	0.2592	0.286	0.2709	-0.117	0.1804
Short further education	-0.437*	0.1916	0.060	0.1890	-0.481*	0.2177	-0.1656	0.1349
Job tenure in years	0.010	0.0086	-0.004	0.0093	0.006	0.0109	0.010	0.0070
Leader status ^a	0.181	0.2451	0.743*	0.3642	0.348	0.5299	-0.267	0.2914
Unemployment rate	-0.011	0.0295	0.010	0.0223	0.021	0.0369	-0.029*	0.0139
1. Noise ^a	-0.587*	0.2142	0.104	0.2853	-0.529(*)	0.2808	-0.044	0.1963
2. Odd work positions	-0.176	0.1062	-0.493*	0.1827	-0.226	0.1476	-0.380*	0.1126
3. Influence	0.244*	0.0906	0.395*	0.1190	0.121	0.1252	0.247*	0.0880
4. Low control–high demand	-0.658	0.4282	-0.919	0.6509	-0.991	0.5711	-0.003	0.5338
5. Job security 1 year ^a	0.087	0.3488	-0.292	0.2948	0.469*	0.3909	0.369*	0.1888
6. Information	0.475*	0.0926	0.759*	0.1206	0.607*	0.1390	0.623*	0.0896
7. Role conflicts ^a	-0.626*	0.1441	-0.578*	0.1632	-0.435*	0.2099	-0.542*	0.1212
8. Social support	0.371*	0.0678	0.314*	0.0742	0.459	0.0856	0.362*	0.0508
9. Exposed to aggression ^a	-0.294	0.2811	-0.732*	0.1916	-0.348*	0.2922	-0.335*	0.1397
10. Flexible hours	0.175*	0.0528	0.143	0.0598	0.171*	0.0685	0.104*	0.0471
Monthly pay. Ln kr	0.639*	0.2705	0.066	0.2794	0.611*	0.2802	-0.092	0.2195

^a Dichotomous variables.

CI: 95% confidence interval. Significance levels: (*) $0.05 < p < 0.10$, * $0.0000 < p < 0.05$.

Number of observations: Reg. 1 = 1,356, Reg. 2 = 959, Reg. 3 = 728, Reg. 4 = 1,754.

–log (Likelihood): Reg. 1 = 639.3, Reg. 2 = 483.2, Reg. 3 = 363.1, Reg. 4 = 907.1.

Pseudo R^2 s: Reg. 1 = 0.17, Reg. 2 = 0.18, Reg. 3 = 0.17, and Reg. 4 = 0.13.

Appendix C: Estimating high job satisfaction on the 2000 cross-sectional data

	(Reg. 1)				(Reg. 2)			
	Private (N = 2,057)				Public (N = 1,296)			
	OR	P > z	CI lower	CI higher	OR	P > z	CI lower	CI higher
Cohabiting ^a	1.358	0.042	1.011	1.823	0.959	0.829	0.655	1.404
Number of children	0.934	0.263	0.829	1.053	0.979	0.782	0.842	1.138
High school or less ^a	1.361	0.064	0.982	1.886	0.708	0.154	0.441	1.138
Short further education	0.653	0.004	0.488	0.8727	0.881	0.451	0.634	1.224
Job tenure in years	1.016	0.024	1.002	1.030	1.012	0.144	0.996	1.029
Leader status ^a	1.252	0.323	0.802	1.957	1.580	0.267	0.704	3.544
Unemployment rate	1.006	0.796	0.961	1.054	0.991	0.753	0.938	1.047
1. Noise ^a	0.628	0.008	0.444	0.888	1.030	0.906	0.628	1.691
2. Odd work positions	0.845	0.058	0.710	1.005	0.859	0.282	0.651	1.133
3. Influence	1.121	0.139	0.964	1.303	1.483	0.001	1.181	1.862
4. Low control–high strain	0.464	0.033	0.229	0.940	1.616	0.677	0.168	15.497
5. Job security 1 year ^a	1.186	0.535	0.692	2.031	0.7185	0.289	0.390	1.324
6. Information	1.430	0.000	1.219	1.679	1.592	0.000	1.259	2.011

Appendix C: Continued

	(Reg. 1)				(Reg. 2)			
	Private (N = 2,057)				Public (N = 1,296)			
	OR	P > z	CI lower	CI higher	OR	P > z	CI lower	CI higher
7. Role conflicts ^a	0.648	0.000	0.508	0.827	0.747	0.055	0.555	1.006
8. Social support	1.407	0.000	1.233	1.604	1.335	0.000	1.160	1.536
9. Work place aggression ^a	0.792	0.284	0.517	1.213	0.775	0.161	0.542	1.107
10. Flexible hours	1.164	0.000	1.069	1.268	1.113	0.063	0.994	1.246
Monthly pay. Ln kr	1.711	0.006	1.164	2.515	0.847	0.546	0.495	1.450
Male social support	0.992	0.897	0.878	1.121	—	—	—	—
Male job security	—	—	—	—	0.876	0.445	0.625	1.230
11. Recognition from leader	1.701	0.000	1.477	1.959	1.741	0.000	1.453	2.086
12. Job future opportunities	1.450	0.000	1.293	1.628	1.499	0.000	1.298	1.732

^a Dichotomous variables.
CI: 95% confidence limits.
Pseudo R²s: Reg. 1 = 0.22, Reg. 2 = 0.18.
-log (Likelihood): Reg. 1 = 929.9, Reg. 2 = 588.9.

Appendix D: Estimating the outcome being highly motivated on 2000 cross-sectional data

	(Reg. 1)				(Reg. 2)			
	Private (N = 2,057)				Public (N = 1,292)			
	OR	P > z	CI lower	CI higher	OR	P > z	CI lower	CI higher
Cohabiting ^a	1.175	0.237	0.899	1.534	1.489	0.017	1.072	2.068
Number of children	1.038	0.468	0.938	1.148	0.963	0.564	0.848	1.093
High school or less ^a	1.158	0.315	0.869	1.540	1.315	0.195	0.869	1.989
Short further education	1.095	0.479	0.850	1.410	1.204	0.174	0.920	1.574
Job tenure in years	0.999	0.908	0.987	1.010	0.998	0.765	0.984	1.011
Leader status ^a	1.328	0.090	0.956	1.842	0.897	0.681	0.534	1.504
Unemployment rate	1.016	0.441	0.976	1.057	0.954	0.049	0.909	0.999
1. Noise ^a	0.849	0.365	0.595	1.210	1.126	0.594	0.727	1.742
2. Odd work positions	1.112	0.220	0.938	1.318	1.126	0.364	0.872	1.452
3. Influence	1.414	0.000	1.213	1.647	1.752	0.000	1.403	2.186
4. Low control–high strain ^b	1.283	0.530	0.589	2.795	—	—	—	—
5. Job security 1 year ^a	0.594	0.044	0.357	0.987	0.657	0.092	0.403	1.070
6. Information	1.215	0.014	1.040	1.420	1.208	0.079	0.977	1.493
7. Role conflicts ^a	0.708	0.002	0.565	0.885	0.769	0.043	0.597	0.991
8. Social support	1.231	0.000	1.115	1.358	1.180	0.001	1.065	1.306
9. Work place aggression ^a	1.441	0.063	0.981	2.117	1.074	0.654	0.787	1.464
10. Flexible hours	1.007	0.856	0.934	1.084	0.955	0.327	0.870	1.047
Monthly pay. Ln kr	1.178	0.348	0.836	1.659	1.194	0.450	0.754	1.889
Male social support	1.008	0.857	0.923	1.100	—	—	—	—
Male job security	—	—	—	—	0.952	0.738	0.715	1.267
11. Recognition from leader	1.822	0.000	1.583	2.096	1.508	0.000	1.281	1.774
12. Job future opportunities	1.308	0.000	1.178	1.451	1.319	0.000	1.168	1.488

^a Dichotomous variables.
^b Low control–high strain left out of the analysis for public employees due to perfect correlation with the outcome $y = 0$.
CI: 95% confidence interval.
Pseudo R²s: Reg. 1 = 0.13, Reg. 2 = 0.11.
-log (Likelihood): Reg. 1 = 1193.8, Reg. 2 = 796.1.

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