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WORKING PAPER

Are young workers compensated for a high strain job?

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Abstract

In this paper we test whether starters in a stressful job get a compensation for the burden they face. The compensating wage differentials model predicts a wage compensation for accepting a job with high workload. The Karasek model (1979) highlights the importance of a balance between demands and control in the job. The combination of both models leads to the hypothesis that the wage compensation for high workload will be lower in a job with high autonomy. The selectivity corrected estimations do not confirm this hypothesis. So, entrants on the labour market who start in a stressful job are in a problematic position as they are not compensated for this burden.

Keywords: job-demand-control model of Karasek, wage compensation, stress
JEL-code: J31

1. Introduction

In this paper we test whether starters in a stressful job get a compensation for the burden they face. If we consider high workload in a job as a stressor which constitutes a burden for the worker, the compensating wage differentials model predicts that workers accepting a job with high workload will receive a wage compensation (Rosen, 1986). This model has very strict assumptions (e.g. perfect information and perfect mobility among workers). Job search models (Mortensen, 1986; Burdett, 1978) offer a possible explanation for the lack of a compensation for high workload. The Karasek model (1979) refines the qualification of 'workload' as burdensome aspect of work, by highlighting the importance of a balance between demands in the job (i.e workload) and the control one can exercise in that job (i.e. the job autonomy one has). Especially a job with high workload and low autonomy (a 'high strain job') is supposed to be stressful, whereas a high demanding job with a lot of autonomy (an 'active job') results in learning opportunities. So we might expect that the wage compensation for high workload, if any, will be lower in a job with high autonomy (active job). Testing this hypothesis is the aim of this paper.

Previous research showed that entrants in a job with high workload and low autonomy ('high strain job') are less satisfied (De Witte et al., forthcoming). Therefore, it is important to analyse whether they get a compensation for this additional burden in their job. Without compensation, these young workers are really worse off. If they are compensated, there might be no reason for concern.

2. Theoretical frameworks

2.1 Wage compensation

The origins of the compensating wage differentials theory can be found in the work of Adam Smith: "The whole of the advantages and disadvantages of the different employments of labour and stock must, in the same neighbourhood, be either perfectly equal or continually tending to equality. If in the same neighbourhood, there was any employment evidently either more or less advantageous than the rest, so many people would crowd into it in the one case, and so many would desert it in the other, that its advantages would soon return to the level of other employments. This at least would be the case in a society were things were left to follow their natural cause, where there was perfect liberty, and where every man was perfectly free both to choose what occupation he thought proper and to change as often as he thought proper" (Smith, 1776).
Rees (1973) argues that Smith's approach is incomplete in one important respect, namely that he writes as all workers have identical tastes.

The impact of tastes of workers is integrated by applying the hedonic hypothesis. This hypothesis states that goods are valued for their utility–bearing attributes or characteristics. Hedonic prices are

defined as implicit prices of attributes and are revealed to economic agents from observed prices of differentiated products and the specific amounts of characteristics associated with them (Rosen, 1974).

Rosen (1986) formulated this application of hedonic prices to labour market transactions. A labour market transaction is viewed as a tied sale in which workers simultaneously sell (rent) the services of their labour and buy the attributes of their job. These attributes are fixed for any one job, but may vary from job to job. On the other hand employers simultaneously buy the services and characteristics of workers and sell the attributes of jobs offered to the market. The characteristics of a particular worker are fixed, but may differ among workers. An acceptable match occurs when the preferred choices of an employer and an employee are mutually consistent. The actual wage paid is therefore the sum of two conceptually distinct transactions, one for labour services and worker characteristics, and another for job attributes. In this sense the labour market may be viewed as an implicit market in job and worker attributes (Rosen, 1986).

According to the basic compensating wage differential model, workers in a job with high workload should receive wage compensation.
Three assumptions at the supply side are needed to arrive at the prediction of the compensating wage differential theory (Ehrenberg and Smith, 2003):

1 Utility maximisation (workers maximise their utility, not their income)
2 Worker information (workers are aware of the job characteristics of importance for them)
3 Worker mobility (workers have a range of job offers from which to choose)

On the demand side also three assumptions are needed (Ehrenberg and Smith, 2003):

1 It is costly to reduce the “bad” characteristic (in our context this is high workload)
2 Firms operate at zero profit (due to competitive pressure)
3 All other job characteristics are already determined

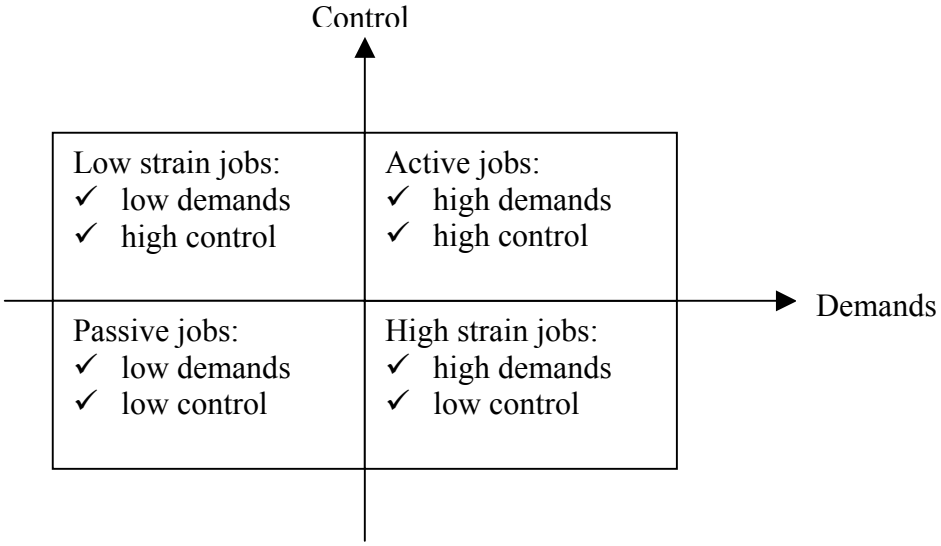
For school leavers, the assumptions at the supply side are very restrictive. According to the wage search model of Mortensen (1986) and Burdett (1978) the search process for a job stops when the wage offered exceeds the reservation wage. Blau (1991) includes non pecuniary work characteristics as indicators of the search process. As a consequence, the utility of the job becomes the unique determining element in the search process, instead of the wage. The reservation utility is a predetermined minimum acceptable utility level, determined by the level where the benefits of an additional search are equal to the benefits of accepting the job with its minimal acceptable utility level. When allowing for on-the-job-search, there are two reservation utilities: A and B (with A<B). When the respondent receives an offer with a utility that exceeds reservation utility A, the respondent accepts the job and continues searching for another job while working. He continues to search with an intensity that equals the marginal cost and return to search effort. The respondent quits the job, when he receives an offer with a utility equal or larger than the utility of his/her actual job. When the respondent receives a job offer of which the utility equals or exceeds reservation

utility B, the respondent accepts that job and stops searching for another job (the marginal cost exceeds the marginal return of search effort). In this framework, the accepted job should not be a utility maximizing job. It is sufficient that the utility of the accepted job exceeds the reservation utility level A. Given the cost of searching, it is not evident that people have 'a range of offers' to choose from. In this search theoretical framework, we are only sure that people will accept a job with a higher utility than the reservation utility level. This could be a high workload job. It is uncertain that the school leaver receives an alterative low workload job offer at the same moment. Because of this uncertainty, it is not necessary to pay a compensation for high workload.

2.2 'Job Demand-Control'-Model of Karasek (1979)

The job-demand-control model of Karasek (1979) achieved a dominant position within work and organizational psychology. One of the reasons is it simplicity, since it distinguishes only two basic dimensions when analysing jobs. The combination of psychological job demands and control or decision latitude gives rise to four job types, as described in figure 1. On the basis of the combination of both dimensions, Karasek formulated two hypotheses. The stress-hypothesis states that high demands combined with low decision latitude (a 'high strain' job) give cause for stress. The activity hypothesis states that the combination of high demands with a high level of control (an 'active' job) gives opportunities for growth and for the increase of one's competencies (Karasek, 1979).

Fig. 1: Jobtypes in the Karasek model (Karasek, 1979)



We can conclude that, according to the Karasek model, high workload is not per definition negative, as it can be a source of motivation when combined with a high level of control. Expressed in terms of preferences, we can summarise the Karasek model as follows: utility is decreasing with an increase in demands, and increasing with an increase in control.

3. Previous empirical research

The Karasek model has been the focus of a large amount of empirical research (e.g. De Jonge & Kompier, 1997; Karasek & Theorell, 1990; van der Doef & Maes, 1999). The main focus is on the stress hypothesis. Research concerning the activity hypothesis is rather scarce. In general, research clearly confirms the stress hypothesis. In their review of 20 years of empirical research on the Job Demand Control model, van der Doef and Maes (1999) conclude that most studies support the hypothesis that employees in high strain jobs are worse off: they experience a lower level of psychological well-being, less job satisfaction, more burnout and more job-related psychological distress. Epidemiological studies equally show that workers in a high strain job exhibit lower levels of various aspects of physical health, such as cardiovascular diseases (De Jonge & Kompier, 1997). Most studies show that both job characteristics distinguished by Karasek exhibit main effects on these (psychological and physical) outcome variables: an increase in job demands is associated with a decrease in health and well-being, whereas an increase in job control is associated with an increase in these outcome variables. As a conclusion, research demonstrates that more job demands are stressful, whereas more control in the job leads to a decrease in stress among workers.
A previous test of the Karasek model with the SONAR dataset (i.e. the dataset used in this paper) confirms both the stress and the activity hypothesis. The combination of high demands and low control did result in lower overall job satisfaction (De Witte et al., forthcoming). This combination is typical for a high strain job, and can be considered as a particularly stressful situation.

A lot of empirical work has been done concerning the compensating wage differentials model. Most work has been done with respect to the risk of injury or death on the job. Viscusi (1993) gives an overview of labour market studies concerning the value of life and job injuries. Although the estimations vary considerably, the hypothesis that wages will be higher when the risks are higher, is mostly supported. A variety of other job characteristics have been the focus of research on compensating wage differentials. Wage premiums have been found for night work, inflexible work schedules, having to stand a lot and working in a noisy environment (Ehrenberg, 2003). Smith (1979) however summarises that the theory of compensating differentials is only conclusive in case the job contains a risk of dying, but inconclusive with respect to other job characteristics.

Recent work estimating a wage differential for high workload work is non existent. Two recent papers do estimate a price for stress. Both papers measure stress using respondent answers on the question whether their work is ‘mentally stressful’ (French& Dunlap, 1998) or ‘mentally demanding’ (Groot and Maassen van den Brink, 1999). French and Dunlap (1998) estimate compensating wage differentials for job stress, using OLS. Their findings suggest that a compensating wage differential does exist in occupations with above-average levels of mental stress. Groot and Maassen van den Brink (1999) include sample selection correction terms and

found a compensation of 6-9% for workers in stressful jobs. This means that these workers earn 6-9% more than they would have earned in jobs without stress.

The main contribution of our work is testing the impact of 'job control' on the wage differential for high workload. We define stress in an accurate way by using one of the leading models in job stress research and we combine the Karasek model with the predictions of economic models about the pricing of job characteristics.

4 Data

We will test the hypothesis whether there is a wage compensation for high workload and if so, whether it is larger in jobs where high workload is combined with low autonomy. We test this for the Flemish youth labour market using the SONAR data. The SONAR dataset contains information about the transition from school to labour market for 23 years old, resulting from face-to-face interviews. Month to month registrations of the educational and labour market career as well as opinions about work in general and background information are available. For a detailed overview of the SONAR dataset we refer to SONAR (2000) and SONAR (2004).
For this research we will use the second wave of 3.000 23-years-old (born in 1978). We will estimate the compensating differential for high demands in the first job, as the dataset contains extended information about that job.
Not all 3.000 individuals are included, as not all of them found work (or had worked) yet when they were questioned (i.e. at the age of 23). We also excluded self-employed people. As a result the sample we use consists of 2093 respondents.

The measurement of job characteristics (such as job demands and control) can be done in two ways: observers can rate the job of a specific worker (a so called 'objective' measurement), or workers can rate their own jobs ('subjective' measurement; see e.g. Frese & Zapf, 1988). Both methods are in fact 'subjective', however, as both ratings have to be performed by an individual. The observer ratings have the advantage that the rating is performed separately from the respondent, thus excluding subjective evaluations and actual mood states of the observed worker. The disadvantage, however, is that the observer can only sample a specific (visible) part of the job performed, within a given time span. The self description of the worker has the advantage that he or she can take all possible aspects of the job into account, whether or not they are visible or scarce. The correlation between both methods, however, is rather high (Fried & Ferris, 1987; O'Brien, 1986). Fried & Ferris (1987) in their analysis of 15 studies handling this problem found a median correlation of 0.63 between the so-called 'objective' and 'subjective' rating, suggesting that both methods measure the same reality. As a consequence, it is warranted to use self-descriptions of workers, collected during interviews.

We constructed a demand and control variable based on a list of items about different characteristics of their job, tested in previous research (e.g. De Witte, 1990; Hooge & De Witte, 1998). The respondents had to rate these items on a 4-point scale, ranging from completely agree, rather agree, rather disagree, to completely disagree.

We used the items related to job demands and job control. For job demands we could only use one item, asking whether one had to work at a great pace or under time pressure. To measure job control we used an average of three items: were the workers able to decide (a) what to do on a particular day, (b) how much work they had to perform that day and (c) how to perform the job. Joining these 3 items together is allowed since their internal consistency (measured by Cronbach's alpha) is 0.809.

For both job characteristics completely and rather agree were considered as 'high' and completely and rather disagree were considered as 'low'. The table shows the distribution of jobs in the sample.

Table 1: Number of the different job types in the sample

	low control	high control
low demands	Passive jobs: 509	Low strain jobs: 412
high demands	High strain jobs: 832	Active jobs: 338

5 Estimation procedure

5.1 Estimation of the wage equation

The standard human capital earnings function as developed by Mincer is of the form (Mincer, 1974):

$$\ln W_i = \alpha_0 + \alpha_1 X_i + \upsilon_i$$

where the vector X contains schooling, experience and experience squared. The constant term α_0 represents the log of the earnings of someone without any additional investment in human capital. As we are considering the first job, no experience terms can be added. In addition to the human capital variable schooling we add personal, firm and job characteristics to the vector X. Using the semi-logarithmic specification, the coefficients α_1 can be interpreted as percentage changes in the starting wage for the variable considered.

As we are interested in comparing the wage between the different job types, we will estimate the following equation:

$$\ln W_i = d1 + d2 + d3 + d4 + \alpha_1(X_i * d1) + \alpha_2(X_i * d2) + \alpha_3(X_i * d3) + \alpha_4(X_i * d4) + d1 * \upsilon_1 + d2 * \upsilon_2 + d3 * \upsilon_3 + d4 * \upsilon_4$$

With d1,d2, d3 and d4 dummy variables for the different job types (passive jobs, high strain jobs, low strain jobs and active jobs). A joint test whether the coefficients for the different job types were equal or not will be performed.

5.2 Sample selection

It is possible that selection over the different job types is not completely random. Workers selecting themselves in a certain job type might be better off in this job type than in alternative ones. Therefore, the results from the wage predictions for the different job types might be biased (respondents who are not better off in a certain job type are omitted in the estimation; the sample is thus censored). Following standard procedures to correct for sample selection, we check if sample selection for the job types is significant.

The general idea of correcting sample selection is that the variables causing the specification error are estimated. These estimates are then used as regressors to estimate the wage functions.

A widely used method to correct for sample selection is the Heckman procedure (1979). Different from Groot & Maasen Van den Brink (1999) where the selection equation is binary, we need the generalisation of Lee (1983) to polychotomous choice selectivity models.
However Bourguignon, Fournier and Gurgand (2001) show that the method of Lee relies on a very unlikely particular case and they provide an alternative to get consistent estimates.

5.2.1 Estimation procedure based on Lee

In a first step the job type K (i.e. the four Karasek job types) is estimated for the whole sample using the following multinomial logit model:

$$K_{ij} = \delta_{0j} + \delta_{j1} Y_i + \varepsilon_{ij} \qquad \text{for } j = 1,\ldots 4$$

Y: vector of personal and job characteristics

The parameters are estimated by maximum likelihood and the probabilities P_{ij} (that an individual i chooses job type j) are computed. Out of these estimates the sample selection correction terms are calculated as suggested by Lee (1983). The log of the hourly wage on a set of personal and job characteristics is than regressed, whereby the sample selection correction terms (λ_{ij}) are included as an additional regressor.

$$\ln W_{ij} = \alpha_{0j} + \alpha_{1j} X_i + \kappa_j \lambda_{ij} + \mu_{ij} \qquad \text{for } j = 1,\ldots 4$$

The correct asymptotic covariance matrix for the different wage equations is computed as in Heckman (1979).

5.2.2 Estimation procedure based on B-F-G

Bourguignon et al (2001) show that the Heckman based correction term only incorporates the correlation between υ_j and ε_j for the choice j but neglects the possible correlation of υ_j with ε_j for the other possible choices. They correct this as follows[4]:

$$\ln W_{ij} = \alpha_{0j} + \alpha_{1j} X_i + \sigma_j \left[\rho_1 m(\hat{P}_1) + \rho_2 m(\hat{P}_2) + \rho_3 m(\hat{P}_3) + \rho_4 m(\hat{P}_4) \right] + \mu_{ij} \qquad \text{for } j = 1,...4$$

with ρ_1 : the correlation between υ_j and ε_1^*

$m(\hat{P}_1)$: the conditional expected value of ε_1^*

$\varepsilon_1^* = \Phi^{-1}(G(\varepsilon_1))$ G(.) is the cumulative of the Gumbel distribution function

Bourguignon et al (2001) suggest the use of weighted least squares in the second step model to gain efficiency. To obtain consistent standard errors they recommend a bootstrap method.

6 Estimation results

6.1 Sample selection

In appendix 1 the selection and wage equations results correcting for sample selection using the method of Bourguignon- Fournier-Gurgand can be found. To estimate the job type we use a multinomial logit model with the parameters of a passive job normalised to zero. Since the selection terms in the estimated wage equations are not significant, we do not discuss them further on.

6.2 Wage differentials

The estimated wage equation (without sample selection correction) can be found in appendix 2. We test whether the coefficients for the different job types were equal or not. The joint hypothesis that the differences in coefficients equals zero was rejected (p=0.0001).

Since we only observe the actual wage, we have to calculate the counterfactual wage. To eliminate the effects of the random term, we use the estimates to calculate all the wages (the wage when workload is high and the wage when workload is low). Table 2 offers the mean and median value of the predicted wages in all 4 job types. The wages of passive jobs and high strain jobs (the two job types in the low control segment) are close to each other. The same holds for the wages of the job types in the high control segment (low strain jobs and active jobs). It is also clear that the wages in the high control segment are higher than those in the lower control segment. The second part of table 2 offers the counterfactual wage for each jobtype: the wage one would have earned if one works in a job with high respectively low workload. So the counterfactual wage for the passive jobs

[4] For details about the bias in the Heckman type correction and the alternative for it, we refer to Bourguignon, Fournier & Gurgand (2001).

is the wage these people would earn in a high strain job. The counterfactual wage for high strain jobs is the wage workers in a high strain job would earn in a passive job.

Table 2 The distribution of the observed and predicted wages for the different job types.

	predicted wage				predicted counterfactual wage			
	passive	high strain	low strain	active	passive	high strain	low strain	active
Mean	1.777	1.772	1.864	1.862	1.772	1.781	1.852	1.871
Median value	1.770	1.767	1.851	1.871	1.765	1.770	1.861	1.873

Since we are interested whether or not there is a wage differential for high workload, we compute the wage differential between working in a high workload job and working in a low workload job. So we calculate the wage difference (d) as the wage which would be earned when one works in a job with high workload (H) minus the wage one would get in a low workload job (L):

$$d = E(\ln(W_i^H) - E(\ln(W_i^L)$$

We calculate this wage difference for the low ad high control segment.

The average and median values of the wage differential in both segments are presented in table 3. On average, workers in a high workload job earn less than if they would work in a low workload job. In the high control segment this average wage loss is even higher than in the low control segment (0.56% versus 0.41%). The median values are also negative, which means that more than half of the population has a wage loss because of working in a high workload job.

Table 3: Mean and median value of the wage differential (in%)

	Low control segment	High control segment
Mean value	-0.41	-0.56
Median value	-0.49	-0.67

In general we can conclude that no evidence is found in favour of a wage differential for high workload jobs. On average there is a wage loss of having a high workload job, in both segments.

7 Conclusion

The main conclusion of our empirical work is that young workers are not compensated for high workload in their job. The compensating wage differentials framework predicts that workers should get a compensation for disamenities in the job. We thus hypothesised that workers get a wage compensation for taking a job with high workload. The combination with the Karasek model leads to the hypothesis that the wage compensation for workload should be lower in the high control segment (i.e. for the active jobs) than in the low control segment. Our empirical results do not

support this hypothesis. First of all, we can conclude that the compensating wage differentials theory, which predicts a compensation for disamenities in the job, is not valid for workload. Perhaps compensation is only given for really threatening characteristics of the work (a risk to die seems the typical example where the compensating wage differentials theory is valid). A possible explanation why this theory is not valid for less dangerous circumstances can be found in the search theoretical framework (Mortensen, 1986; Burdett, 1978 and Blau, 1991). This theory predicts that school leavers accept the first job which offers a utility higher than a predetermined reservation utility level. Since searching for a job is not 'a free lunch' the accepted job is not necessary the utility maximizing job.

If we combine this conclusion with the conclusion that the combination of low autonomy and high workload does indeed result in stressful jobs (as witnessed by lower overall job satisfaction, see De Witte et al., forthcoming), we can conclude that workers in high strain jobs are really worse off. First of all, they have a stressful job and (as a consequence) feel less satisfied. In addition to this, we have found that they are not compensated for this less favourable position. The other job type that Karasek distinguished is the active job (characterised by high workload but also high autonomy). According to Karasek, this combination leads to growth. In this research, we also observe that these young workers - and workers in the high control segment in general - are better paid than their counterparts. These results lead to the conclusion that our supposed segments according to the control provided in the job are a true duality in the labour market for young people. On the one hand the better paid active jobs with on average higher job satisfaction and on the other hand the less paid dissatisfying stressful jobs.

Two important questions for further research arise. First of all, we can ask the question if young workers try to avoid such an unfavourable position by leaving their stressful job more rapidly than their counterparts in other types of jobs (turnover). Secondly, we have to find out whether stressful jobs are only a start position or if they are the start of a career in this type of job? The latter would have important policy implications, as in current discussions "stress" is often considered as high workload only, without linking this aspect to the control dimension. Our results seem to suggest that first of all high workload combined with autonomy is not per se negative and secondly that jobs with a high level of control are better-paid jobs.

Appendix 1:

Results of Bourguignon-Fournier-Gurgand method to correct for sample selection

Results of the multinomial logit model on Karasek job type (selection equation)

	high strain job	low strain job	active job
Constant	-1.34***(0.36)	0.21 (0.41)	-2.85***(0.53)
Man (ref)			
Woman	0.26*(0.15)	-0.15 (0.18)	0.09 (0.19)
Living without partner (ref)			
Living with partner	0.17 (0.14)	0.25 (0.16)	0.14 (0.18)
Number of children	-0.24 (0.16)	0.04 (0.19)	-0.16 (0.24)
lower education	0.14 (0.39)	0.29 (0.50)	0.41 (0.62)
lower secondary education	0.22 (0.20)	-0.28 (0.29)	0.08 (0.32)
higher secundary education			
higher education (3 years)	-0.06 (0.19)	0.14 (0.21)	0.42*(0.23)
higher education (more than 3 years)	-0.01 (0.36)	0.65*(0.35)	0.73*(0.37)
Permanent contract (ref)			
Temporary contract	-0.35***(0.14)	-0.42***(0.16)	-0.41**(0.17)
Full-time (ref)			
Part time	-0.25 (0.19)	-0.49**(0.23)	-0.65**(0.27)
Clerk (ref)			
Worker	-0.18 (0.19)	-0.68***(0.24)	-0.80***(0.27)
Small company (>10 employees)	-0.14 (0.18)	-0.01 (0.22)	-0.37 (0.24)
Medium company (ref)			
Large company (<50 employees)	-0.14 (0.15)	0.14 (0.18)	-0.18 (0.19)
Working during the day (ref)			
Working during the night	0.35*(0.18)	-0.01 (0.27)	-0.05 (0.30)
Not working in shifts (ref)			
Working in shifts	0.30*(0.17)	-0.49**(0.24)	-0.63**(0.27)
Elementary job level	0.50**(0.22)	-0.13 (0.28)	0.77**(0.32)
Lower job level	0.19 (0.17)	-0.22 (0.21)	0.47**(0.24)
Intermediate job level (reference)			
Higher job level	0.24 (0.22)	0.56**(0.23)	0.65***(0.25)
Scientific job level	0.79*(0.41)	0.72*(0.40)	1.09***(0.40)
Not giving direction (ref)			
Giving direction	0.18 (0.29)	-0.02 (0.33)	0.68**(0.31)
Service sector	0.31*(0.17)	-0.26 (0.21)	-0.05 (0.23)
Public sector	-0.06 (0.23)	0.09 (0.26)	-0.58*(0.29)
Characteristics of the work			

Requiring much physical effort	0.79***(0.14)	-0.27 (0.17)	0.18 (0.19)
Requiring much mental effort	0.36**(0.15)	-0.01 (0.18)	1.11***(0.25)
Requiring many creative ideas	0.25 (0.16)	0.64***(0.18)	1.04***(0.20)
Dangerous or unsafe circumstances	0.63***(0.19)	0.25 (0.25)	0.44*(0.26)
Smelly or noisy surroundings	0.43***(0.15)	0.18 (0.20)	0.48**(0.22)
Many responsibilities	0.40***(0.15)	0.08 (0.17)	0.53***(0.20)
No varied work	0.38*(0.21)	-0.44*(0.23)	0.42 (0.33)
In which one can indulge oneself	0.54***(0.14)	0.10 (0.17)	0.15 (0.19)
Study regularly to keep up-to date	-0.41***(0.15)	0.29 (0.18)	0.17 (0.20)
Many contacts with other people	-0.05 (0.17)	-0.43**(0.18)	-0.01 (0.19)

Log Likelihood: -2219,4064

Standard errors between brackets

* significant at 10% level, ** significant at 5% level, *** significant at 1% level

Results of the wage equations

	passive jobs	high strain jobs	low strain jobs	active jobs
Constant	1.68***(0.14)	1.85***(0.06)	1.77***(0.12)	1.76***(0.17)
Man (ref)				
Woman	-0.05**(0.02)	-0.10***(0.02)	-0.04*(0.02)	0.01 (0.03)
lower education	-0.02 (0.07)	0.00 (0.06)	-0.03 (0.05)	0.32*(0.17)
lower secondary education	0.00 (0.03)	-0.04 (0.02)	-0.06 (0.04)	0.00 (0.05)
higher secundary education				
higher education (3 years)	0.11***(0.02)	0.05**(0.02)	0.11***(0.03)	0.06*(0.03)
higher education (more than 3 years)	0.07 (0.10)	0.10*(0.06)	0.19***(0.04)	0.19***(0.05)
Permanent contract (ref)				
Temporary contract	-0.01 (0.02)	-0.04**(0.02)	0.00 (0.02)	0.02 (0.02)
Full-time (ref)				
Part time	0.11***(0.03)	0.16***(0.03)	0.16***(0.04)	0.14**(0.05)
Clerk (ref)				
Worker	0.01 (0.03)	-0.04 (0.03)	-0.02 (0.04)	-0.07 (0.05)
Small company (>10 employees)	-0.03 (0.03)	-0.04 (0.03)	0.02 (0.03)	-0.09***(0.03)
Medium company (ref)				
Large company (<50 employees)	0.05**(0.02)	0.08***(0.02)	0.03 (0.02)	0.02 (0.02)
Working during the day (ref)				
Working during the night	0.09***(0.03)	0.05**(0.02)	0.06 (0.05)	0.05 (0.04)
Not working in shifts (ref)				
Working in shifts	0.04*(0.02)	0.02 (0.02)	0.09**(0.04)	0.08*(0.05)
Elementary job level	-0.04 (0.03)	-0.05*(0.03)	0.02 (0.04)	0.05 (0.05)

Lower job level	0.00 (0.02)	-0.02 (0.02)	-0.03 (0.03)	-0.01 (0.04)
Intermediate job level (reference)				
Higher job level	0.06*(0.04)	0.07**(0.03)	0.07**(0.03)	0.09**(0.04)
Scientific job level	0.12 (0.08)	0.07 (0.06)	0.11**(0.05)	0.10**(0.05)
Not giving direction (ref)				
Giving direction	-0.02 (0.05)	0.04 (0.03)	-0.01 (0.05)	-0.01 (0.03)
Service sector	-0.03 (0.03)	-0.01 (0.02)	-0.06**(0.03)	-0.05 (0.03)
Public sector	-0.03 (0.04)	0.00 (0.03)	-0.09***(0.03)	-0.11***(0.04)
_m0	0.03 (0.09)	0.17 (0.13)	-0.06 (0.18)	0.10 (0.21)
_m1	0.01 (0.23)	0.12 (0.08)	0.02 (0.20)	-0.08 (0.24)
_m2	-0.11 (0.22)	0.34*(0.19)	-0.02 (0.08)	-0.20 (0.25)
_m3	0.01 (0.18)	0.04 (0.14)	-0.09 (0.16)	-0.03 (0.06)
(N)	(470)	(776)	(388)	(320)
Adjusted R^2	0.17	0.2	0.16	0.16

Bootstrapped standard errors between brackets (number of replications= number of observations in the subsample)

* significant at 10% level, ** significant at 5% level, *** significant at 1% level

Appendix 2:

Results of the wage equations

	passive jobs	high strain jobs	low strain jobs	active jobs
Constant	1.75***(0.04)	1.78***(0.03)	1.79***(0.04)	1.81***(0.04)
Man (ref)				
Woman	-0.06***(0.02)	-0.10***(0.02)	-0.04**(0.02)	0.01 (0.02)
lower education	-0.01 (0.05)	-0.01 (0.04)	-0.03 (0.07)	0.33***(0.09)
lower secondary education	0.00 (0.03)	-0.03 (0.02)	-0.07*(0.04)	0.00 (0.04)
higher secundary education				
higher education (3 years)	0.11***(0.02)	0.06**(0.02)	0.12***(0.02)	0.06**(0.03)
higher education (more than 3 years)	0.09*(0.05)	0.11**(0.05)	0.20***(0.03)	0.21***(0.04)
Permanent contract (ref)				
Temporary contract	-0.02 (0.02)	-0.04**(0.02)	0.00 (0.02)	0.01 (0.02)
Full-time (ref)				
Part time	0.10***(0.02)	0.16***(0.02)	0.16***(0.03)	0.12***(0.04)
Clerk (ref)				

Worker	0.00 (0.03)	-0.03 (0.02)	-0.03 (0.03)	-0.10***(0.04)
Small company (>10 employees)	-0.03 (0.02)	-0.04**(0.02)	0.02 (0.03)	-0.08***(0.03)
Medium company (ref)				
Large company (<50 employees)	0.05**(0.02)	0.07***(0.02)	0.03*(0.02)	0.02 (0.02)
Working during the day (ref)				
Working during the night	0.09***(0.03)	0.06***(0.02)	0.05 (0.04)	0.05 (0.04)
Not working in shifts (ref)				
Working in shifts	0.03 (0.02)	0.03 (0.02)	0.07**(0.03)	0.06 (0.04)
Elementary job level				
Lower job level	-0.04 (0.03)	-0.03 (0.02)	0.01 (0.04)	0.04 (0.04)
Intermediate job level (reference)	-0.01 (0.02)	-0.01 (0.02)	-0.03 (0.03)	-0.02 (0.03)
Higher job level				
Scientific job level	0.07**(0.03)	0.08***(0.03)	0.08***(0.03)	0.10***(0.03)
	0.13**(0.06)	0.10*(0.05)	0.12***(0.04)	0.12***(0.04)
Not giving direction (ref)				
Giving direction				
	-0.02 (0.04)	0.04 (0.03)	-0.01 (0.04)	-0.01 (0.03)
Service sector	-0.03 (0.02)	-0.01 (0.02)	-0.07**(0.03)	-0.06**(0.03)
Public sector	-0.02 (0.03)	-0.01 (0.03)	-0.09***(0.03)	-0.11***(0.03)

N: 1954

Log Likelihood: 587.46

Standard errors between brackets

* significant at 10% level, ** significant at 5% level, *** significant at 1% level

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