Commuting Time, A Must or a Pleasure?

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Abstract

Every worker needs to travel to his/her work every day. Some have to travel short, whereas others travel more than an hour to their work. From most of the existing literature, commuting time turns out as an unpleasant activity. However, there is also existing literature which argues that some workers do not mind to extend their commuting time. This thesis investigates the relation between commuting and job satisfaction. Moreover, the relation between commuting and two aspects of a job are investigated, namely satisfaction of the atmosphere among colleagues and satisfaction of the relationship between worker and supervisor. The results show a negative relation between commuting time and job satisfaction and the two aspects of a job. Also the relation between tax deduction on travel expenses and job satisfaction is investigated. This relation turns out to be not significant.

Content

1. Introduction

We always start our working day with commuting to our work and we end our working day with travelling back home. Everyone needs to commute. Many of us do so at (almost) the same time and thus, it can be very busy in public transport or on the road from time to time. Sometimes there is a delay in public transport and/or a defect, which makes that you have to commute even longer. When you go by car on a rainy day, you have a big chance to end up in a traffic jam and when you go by bike, you can arrive sodden at work. These examples are a few important reasons why many workers do not like to commute. On the other hand, there are also workers who do not bother to commute and see it as a relaxing moment of the day. According to Ory et al. (2004), it is not that everyone dislikes commuting. They find that a small part of the population actually wants to increase their commuting time. On the other hand, Hilbrecht et al. (2014) find that the more you have to travel to work, it becomes less likely that you are satisfied with your life.

Given that the time spent on commuting is in the workers' leisure, it matters to the worker. In the Netherlands, workers travel 10.5% of the time available for travelling and work on average (Schwanen & Dijst, 2002). An employee could, for example, decline a job because he finds it too far away. On the other hand, an employee could also choose for a specific job because it is close to his/her home. This raises the following question: Does the time which a worker need to travel to his work lowering his job satisfaction? It could also be the other way around, that people who live further away from their work just do longer commuting because they find their job worth it to travel so much. This raises the following research question:

"What is the relation between commuting time and job satisfaction?"

In this thesis, I will to research the relation between commuting time and job satisfaction for Europe. Some workers only have to travel 5 minutes to their work and others have to travel more than an hour. This is relevant for employers, whether they choose someone to work for their company who lives far away or someone who lives close to the company. When the job satisfaction of a worker is high, this will result in better performance of that worker (Petty, McGee, & Cavender, 1984). I also want to research if there are differences within the European Union, due to different policy rules on commuting. For example, in the Netherlands commuting expenses are deductible up to a certain amount depending on employment income (Belastingdienst, 2016). Whether your commuting expenses are deductible could influence job

satisfaction. I predict that workers rate their job higher, when their travel expenses are tax deductible. In that case, workers have the feeling that they get compensated for their commuting time. They see this as something separate from their work.

In the past, researchers also investigated commuting time. Some existing literature shows that commuting time has a negative association with life satisfaction (Kahneman et al., 2004; Stutzer & Frey, 2008; Hilbrecht et al., 2014), while other research finds that commuting can also be experienced as satisfying by a worker (Ory et al., 2004; Jain & Lyons, 2008). There is hardly any research on the relation between commuting time and job satisfaction. However, job satisfaction is important to a worker. For example, the relation between job satisfaction and health is large (Faragher et al., 2005; Roelen et al., 2008). Job satisfaction is also important for the performance of a worker (Lawler II & Potter, 1967; Petty et al., 1984) and job satisfaction is also an important determinant for switching jobs (Freeman, 1978; Delfgaauw, 2007). Following from Wrede (2001), tax deduction should be tax deductible only in some cases. However, there is hardly no research done on the relation between job satisfaction and tax deduction on travel expenses.

For this research, I will use the Questionnaire for Fifth European Survey on Working Conditions (2010). In this questionnaire, 34 European countries are included. In every country, at least 1,000 individuals were interviewed by Eurofound, which leads to 43,816 interviewed individuals. To research the relation between tax deduction on travel expenses and job satisfaction, the source PwC Worldwide Tax Summaries Online will be used (PWC, 2016). This source gives an overview of the corporate and individual taxes in over 150 countries worldwide.

Evidence in this research shows a significant and negative relation between commuting and job satisfaction. Also the relation between commuting and two aspects of a job, atmosphere among colleagues and relationship between worker and supervisor, is negative. The relation between tax deduction on travel expenses and job satisfaction is not significant. Only the relation between tax deduction on travel expenses and satisfaction on the relationship between worker and supervisor is negative and significant at a 10%-level.

The remainder of this research is organized as follows. Section 2 provides a review on the related literature

about commuting, job satisfaction and tax deduction on travel expenses. In this section, I also state the hypotheses that follow from the related literature. Section 3 includes an explanation about the data and the empirical strategy of this research. In section 4, the results from the empirical analysis are provided and in section 5 I end with a conclusion. In that last section, I also answer the research question and provide some final remarks.

2. Related literature

In this section, a review on the existing papers of the research topic will be discussed. I start with existing literature on commuting and after that, job satisfaction is considered. Then, a review on tax deduction on travel expenses is provided. Finally, the hypotheses are stated, based on the related literature.

2.1 Commuting

Commuting is an important activity during a work day. Schwanen & Dijst (2002) find that workers commute 10.5% of the time available for work and travelling in the Netherlands on average. There is a lot of research in the field on commuting. On the one hand, some workers experience commuting time as unpleasant and on the other hand there are workers who experience commuting time as a gift (Jain & Lyons, 2008). Ory et al. (2004) agree with this. They use a survey and find that half of their sample is satisfied with their amount of commuting and a small part of that group even wants to increase their commuting time. Stutzer & Frey (2008) test the influence of commuting time on life satisfaction with panel data from Germany. They find that workers who commute longer, report a lower life satisfaction. Hilbrecht et al. (2014) find the same outcomes as Stuzer & Frey, when you have to travel longer to work, it becomes less likely that you are satisfied with life. Kahneman et al. (2004) use the Day Reconstruction Method (DRM) to research the relationship between daily activities and the feeling about these activities. A part of the population is asked to write down their activities of the previous day and their feelings about these activities. Commuting turns out to be the least positive activity of the day of the respondents. Overall, from (almost) all the literature on commuting, it appears that commuting is seen as an unpleasant activity and sometimes even the most unpleasant activity of a day.

There are also some researchers who link commuting time on job search. For example, van Ommeren (1998) argues, that the probability of searching for another job increases sharply for workers who have to commute longer than 45 minutes to their work. Ommeren, Rietveld & Nijkamp (1999) extend this, by taking into account that workers can move to another house or switch jobs more than once. This makes it easier to understand the relationship between commuting distance and moving. Their results show when the commuting distance grows, that the expected duration of the job will decrease. Clark & Huang (2004) research another aspect of job search. They find that workers, who need to commute a bigger distance between their

work and resident, tend to decrease the commuting distance when they are switching job or resident. To summarize the existing literature on job search and commuting, workers who have to commute longer, tend to search sooner for another job. When they are looking for another job, they also tend to decrease the commuting distance.

Koslowsky & Krausz (1993) did a survey under nurses in several hospitals and they find a positive relation between commuting and stress. They also argue that the level of stress is higher at workers, who use the car in comparison to the workers who use public transport. Gatersleben & Uzzell (2007) also tests the last mentioned finding, but they extend their research with walking and cycling towards work. It turns out, that the journeys by bicycle are the most interesting and excited, and the journeys by foot are the most relaxed. The respondents rate cycling and walking as pleasant, whereas commuting by car and public transport is rated as unpleasant. St-Louis et al. (2014) research the same topic, but make a distinction between the three public transport types; bus, metro and commuter train. It turns out that walking and cycling are the most satisfying transport types, followed by the commuting train. Car, bus and metro are the least satisfying transport types. An addition in this research is that the determinants of satisfaction are divided in; trip characteristics, travel time, personal characteristics, travel preferences and mode preferences. Trip characteristics and travel time are the 'objective' factors, but these do not explain all the variation between the different transport types.

2.2 Job satisfaction

Since we spent a lot of time at work, it is important that we are satisfied with our job. For example, when we are not satisfied with our job, there is a big chance of having health issues (Faragher, Cass, & Cooper, 2005). The relationship between job satisfaction and mental health is extremely large. When a worker is not satisfied with his job, there is a great chance of being mentally ill, such as being depressed or having a burn-out. The same results are found by Roelen et al. (2008), who show that job satisfaction is negatively related to the total days of sickness of a worker.

Job satisfaction is also important for the performance of workers within their company. There is a strong and positive relation between job satisfaction and job performance (Lawler III & Porter, 1967; Petty et al. 1984). However, Schwab & Cummings (1970) argues that there are

covariates which are not taken into account in the relation between job satisfaction and job performance. These covariates may influence the strength and the sign of that relation.

Freeman (1978) shows that a worker will voluntary leave his job sooner, if his job satisfaction is low. Thus, according to the paper of Freeman (1978) there is a negative relation between job satisfaction and leaving the firm. Delfgaauw (2007) describes the same relation and he extends this, by investigating the reasons why some workers leave the firm when they are dissatisfied, while others search for another job within the firm. The workers who leave the firm are often dissatisfied with job domains within the firm, such as management, whereas workers who change job within the firm are most often dissatisfied with job domains that are job-specific.

There is not so much research on the relation between commuting and job satisfaction. Groot & Maassen (1999) research several aspects of a job of older workers. They use commuting time as one of the determinants of overall job satisfaction, but this coefficient is not significant. Spies (2006) investigates the relation between job satisfaction and distance between home and the workplace of a worker. He finds when a worker need to commute longer to work, that this will not always lower the job satisfaction of that worker. However, this research only took place under long-distance commuting conditions in one company of the North-West Russian oil industry.

2.3 Tax deduction on travel expenses

Wrede (2001) studies whether travel expenses should be tax deductible. He finds that travel expenses should not be deductible in case a household is perfectly mobile with respect to their residence, but has to work in a specific region. On the other hand, when households do not mind where they work, commuting expenses should be deductible. Potter et al. (2006) argues that in countries where travel expenses are tax deductible, the total car commuting and trip length rises. This is not a desirable result from the tax deduction on travel expenses. There is hardly any literature about the relation between tax deduction on travel expenses and the job satisfaction of a worker.

2.4 Hypotheses

As said before, there is not many research on the relation between commuting and job satisfaction. In this thesis, I will research this relation. Not everyone dislikes commuting, some people actually want to increase their commuting (Ory et al. 2004; Jain & Lyons, 2008).

However, I predict that commuting time has a negative association with job satisfaction overall. When you have to travel longer, you need to leave earlier and at the end of the day you arrive later at home. This could make a worker less happy at work. So, I predict that this will lead to a lower job satisfaction. Based on the existing literature I state the following hypothesis:

H_1: Commuting time has a negative association with job satisfaction.

To investigate if commuting also has an association with other aspects of a job, I will study the satisfaction of the atmosphere among colleagues and satisfaction of the relation between worker and supervisor. I predict, that the time that a worker is commuting to his work has no association with these two aspects of a job. This leads to the following hypotheses:

H_2: Commuting time has no association with satisfaction of the atmosphere among colleagues.

H_3: Commuting time has no association with satisfaction of the relationship between worker and supervisor.

Based on the existing literature, there is hardly any evidence of the relation between tax deduction on travel expenses and job satisfaction. For that reason, I want to investigate this relation. I predict, that workers who have the feeling that they get compensated for their commuting time do not see commuting as something negative. Therefore, I predict that tax deduction on travel expenses has a positive relation with job satisfaction. This results in the following hypothesis:

H_4: Tax deduction on travel expenses has a positive association with job satisfaction.

To investigate if tax deduction on travel expenses also has a relation with other aspects of a job, I will again consider the satisfaction of the atmosphere among colleagues and the satisfaction of the relationship between worker and supervisor. Thus, I predict that these two aspects of a job have no association with tax deduction on travel expenses.

H_5: Tax deduction on travel expenses has no association with the satisfaction of the atmosphere among colleagues.

H_6: Tax deduction on travel expenses has no association with the satisfaction of the relationship between worker and supervisor.

3. Data & empirical strategy

For this research, the survey called European Working Conditions Survey (EWCS) 2010 will be used. This survey is in the field each five years and is conducted by Eurofound, the European Foundation for the Improvement of Living and Working Conditions. Eurofound also has two other surveys; the European Company Survey (ECS) and the European Quality of Life Survey (EQLS). These two are held every four years, but I will not use them in this research. The EWCS was in the field for the first time in 1990 and each wave was expanded with more countries. The survey of 2015 already took place, but the data is not available yet. The dataset of 2010 contains 43,816 individuals of 15 years or older, whom are in the workforce (in 2010) of 27 European Countries, Norway, Former Yugoslav Republic of Macedonia (FYROM), Croatia, Turkey, Albania, Kosovo and Montenegro. To get in contact, the individuals are visited at home for a maximum of three times. This leads to a response rate of 44,2% on average for all countries. In every country, at least 1,000 individuals were interviewed in their own dialect or language.

The face-to-face interviews started with some questions about the household of the individual. After that, there were 77 questions about the working conditions of the individual. The questionnaire ended with some questions about the demographics of the individual. Since not all questions are useful for this specific research, I will only use the ones that will help me to find an answer on the main research question. To measure job satisfaction, the following question is used: *"On the whole, are you very satisfied, satisfied, not very satisfied or not at all satisfied with working conditions in your main paid jobs?"*. The respondents could answer this question with; very satisfied (4), satisfied (3), not very satisfied (2) and not satisfied at all (1). To measure the satisfaction of the atmosphere among colleagues, I use the following statements:

- *Your colleagues help and support you*[1]
- *I feel 'at home' in this organization*[2]
- *I have very good friends at work*[2]

[1] Respondents answer these statements on a 5-point Likert scale; 1-never, 2-rarely, 3-sometimes, 4-most of the time and 5-always

[2] Respondents answer these statements on a 5-point Likert scale; 1-strongly disagree, 2-disagree, 3-neither agree nor disagree, 4-agree and 5-strongly agree

To measure the satisfaction of the relationship between worker and supervisor, I use the following statements:

- *Your manager helps and supports you*[1]
- *The organization I work for motivates me to give my best job performance*[2]

These statements are useful, because they enable to compute aspects of job satisfaction in which commuting time is (probably) not a part in the rating. Commuting time is measured with the question: "*In total, how many minutes per day do you usually spend travelling from home to work and back?"*. In the regressions, this is converted to hours. Otherwise, the coefficients of commuting time are too small to interpret.

I will use different control variables; gender, age, amount of years employed at specific company, household size, income per hour, work hours per week, level of education, kind of contract and total amount of workers at workplace. Also a country dummy is included, to control for cultural differences in answering the questions between the countries. The level of education is measured with the International Standard Classification of Education (ISCED) (Unesco Institute for Statistics, 1997). This measurement enables to compare the different countries with different education systems and consists of six different levels, from pre-primary education to tertiary education – advanced level (ISCED 6). The kind of contract is divided into six groups, in which an indefinite contract, a fixed term contract and no contract are the most important ones. The total amount of workers at the workplace is divided into eight groups, from working alone toward working with 500 and over colleagues. The variable tax deduction is a variable at the country level and is based on PwC Worldwide Tax Summaries Online (PWC, 2016). This source gives an overview of the corporate and individual taxes of 150 countries worldwide. For this research, I use the individual deductions part wherein they point out which employment expenses are deductible for each country. I do not make a distinction in what way the travel expenses are deductible. Mainly because the rules differ a lot from each other, which makes it hard to compare them with each other. Moreover, is it also hard to find data on this for all countries.

3.1 Descriptive statistics

Table 1 shows the descriptive statistics of the sample used in this research. Most of the respondents indicated that they are satisfied with their job (79,9%) and 20,1% is not satisfied with their job at all. 37,6% of the respondents indicated that their colleagues are always helpful

and supportive and 35,5% indicated that their colleagues are helpful most of the time and supportive. Most of the respondents indicated that they feel at home at their organization (69,4%) and that they have very good friend at work (75,1%). The managers of the respondents are indicated as helpful and supportive, for which 31,1% always agrees with this and 31,8% agrees with this most of the time. Also 61,1% of the respondents indicated that the organization they work for, motivates them to give their best job performance. The respondents travel 41.3 minutes per day on average from house to work and back, for which the standard deviation is 34.0 (Figure 1). The maximum commuting time is 360 minutes, which is stated by three respondents. 48% of the sample is male and the average age is 42 years old. Not all European Countries use the Euro as their national currency, so they convert the given monthly income with the exchange rate of March 1, 2010. However, since not everyone is working the same amount of hours per month, the monthly income is translated into income per hour. This gives an average income of €8.25 per hour (after taxes and social security contributions) and a standard deviation of €10.21. Most of the respondents stopped schooling in ISCED 3. This means that most of the respondents stopped with school when they were 15/16 years old and just finished high school. The mean of years that the respondents are employed at a specific company is 10 years, for which the standard deviation is 9.9 years. The households of the respondents contain 3 persons on average with a standard deviation of 1.4. The respondents work 39 hours per week on average, where most of them have an indefinite contract (76,7%) and work with 10 to 49 workers at their workplace (27,9%).

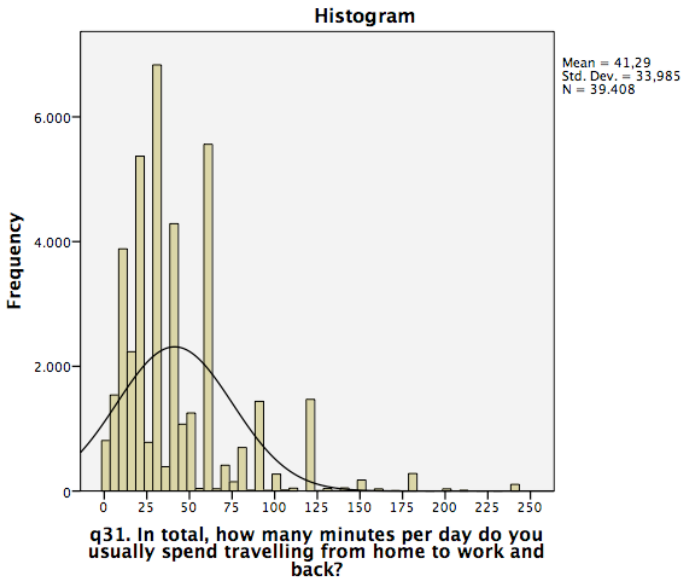

Figure 1: Commuting time

In this research, I will also compare the countries where commuting expenses are tax deductible with the countries where commuting expenses are not tax deductible. To research this, the variable "*tax deduction"* is introduced. This variable is 1 if commuting expenses are tax deductible and 0 if they are not tax deductible according to PwC Worldwide Tax Summaries Online (PWC, 2016). The way in which the commuting expenses are tax deductible differs for every country. For that reason, I will only research the case whether commuting expenses are tax deductible or not. Whether your commuting expenses are tax deductible or not, depend on the country you live. Figure 2 shows a map of Europe, on which the green countries are the countries where commuting expenses are tax deductible and the countries in red are the countries without tax deduction. Table 4 in the appendix provides an overview of all the 34 countries.

Figure 2: Tax deduction

Table 2 shows the descriptive statistics of the differences between the countries where commuting expenses are tax deductible and countries where commuting expenses are not tax deductible. Workers who receive tax deduction on their commuting expenses are more often very satisfied with their job than workers without tax deduction, namely respectively 29,0% and 19,6%. The respondents who do not receive tax deduction on their commuting expenses tend to get less help from their colleagues and have less very good friends at work. However,

they feel ‘at home’ more often in their organization. The manager of the worker who receives no tax deduction on travelling expenses is more helpful and supportive to the respondents, but these workers are less motivated by the organization they work for, to give their best job performance. The commuting time of that group of workers is 39.4 minutes on average, which is shorter than the group with tax deduction. They travel 44.89 minutes to their work on average (see figure 3 and figure 4). Workers whose commuting expenses are tax deductible tend to work longer at their company, but work less hours per week and live in smaller households. Workers who receive tax deduction have an indefinite contract more often and seem to be higher educated than workers who do not receive tax deduction on commuting expenses.

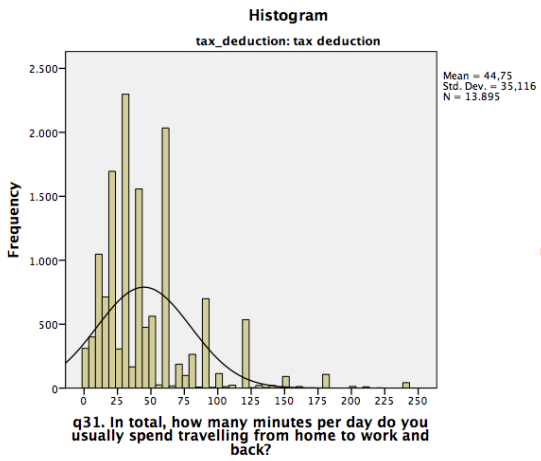

Figure 3: Tax deduction

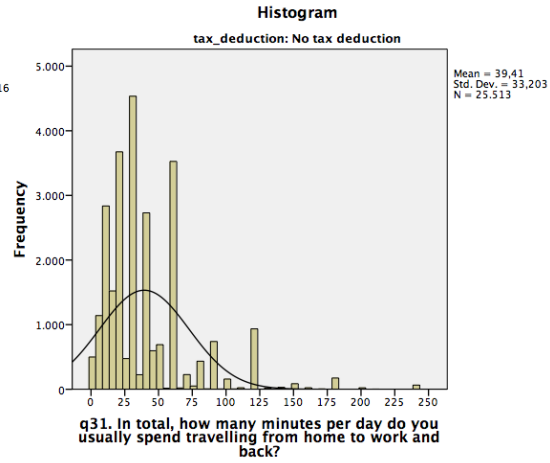

Figure 4: No tax deduction

The correlation matrix (table 3) shows the correlations between all variables. Most variables are highly correlated with each other. All control variables are highly correlated with job satisfaction and it is thus important to include these control variables. Commuting time is negatively correlated with job satisfaction and also with the other statements on the satisfaction of the atmosphere among colleagues and the satisfaction of the relationship between worker and supervisor. All statements are positively correlated with job satisfaction. Except for the statement ‘Your colleagues help and support you’. This statement is negatively correlated with job satisfaction. The control variables only show small correlations between each other, which could indicate that there is no multicollinearity.

3.2 Empirical strategy

To study the relation between commuting time and job satisfaction, three different OLS models will be run. With these models, I want to research the relation between commuting time and job satisfaction. Do workers commute a long time to their work, because they really like their

work? Or are they forced to commute a long time, which lowers their job satisfaction? One model includes job satisfaction in general, the second one includes the satisfaction about the atmosphere among colleagues and the third one includes the satisfaction about the relationship between worker and supervisor. As said before, the second and third model are included in this research to compute aspects of job satisfaction in which commuting time is (presumably) not taken in account by rating the specific statement. This leads to the following regressions:

(1) $Job\ Satisfaction_{in\ general} = \beta_0 + \beta_1 * commuting\ time + \beta_2 * country\_dummy_{-1} + \beta_3 * control\ variables + \varepsilon$

(2) $Job\ Satisfaction_{atmosphere\ among\ colleagues} = \beta_0 + \beta_1 * commuting\ time + \beta_2 * country\_dummy_{-1} + \beta_3 * control\ variables + \varepsilon$

(3) $Job\ Satisfaction_{relationship\ worker\ -\ supervisor} = \beta_0 + \beta_1 * commuting\ time + \beta_2 * country\_dummy_{-1} + \beta_3 * control\ variables + \varepsilon$

The control variables are; gender, age, income, level of education, amount of years employed at specific company, household size, work hours per week, kind of contract and total amount of workers at workplace. The country dummy is included in the regression to control for cultural differences between all countries.

To research the association between tax deduction on travel expenses and job satisfaction, the variable tax deduction on travel expenses is added to the model. As explained in the previous section, I predict when commuting is tax deductible, that workers have the feeling that they get compensated for their commuting time. In that case, commuting time will be less important for job satisfaction. Tax deduction on travel expenses is on the country level, just as the country dummy. This is why an interaction term between tax deduction on travel expenses and commuting time is introduced in the model. Tax deduction on travel expenses is not included as a separate variable, because it is perfectly correlated with the country dummy. This leads to the following regressions:

(4) $Job\ Satisfaction_{in\ general} = \beta_0 + \beta_1 * commuting\ time + \beta_2 * commuting\ time\ x\ tax\ deduction\ on\ travel\ expenses + \beta_3 * country\_dummy_{-1} + \beta_4 * control\ variables + \varepsilon$

(5) $Job\ Satisfaction_{atmosphere\ among\ colleagues} = \beta_0 + \beta_1 * commuting\ time + \beta_2 * commuting\ time\ x\ tax\ deduction\ on\ travel\ expenses + \beta_3 * country\_dummy_{-1} + \beta_4 * control\ variables + \varepsilon$

(6) $Job\ Satisfaction_{relationship\ worker\ -\ supervisor} = \beta_0 + \beta_1 * commuting\ time + \beta_2 * commuting\ time\ x\ tax\ deduction\ on\ travel\ expenses + \beta_3 * country\_dummy_{-1} + \beta_4 * control\ variables + \varepsilon$

3.3 Gauss-Markov assumptions

Since I will use an OLS model, it is important to check the Gauss-Markov assumptions. First of all, the models need to be tested on heteroskedasticity. From the scatterplot of the residuals it turns out that this model suffers from heteroskedasticity (figure 5, 6 and 7). The variance of the error term is not constant. This is presumably the case because the outcome variable is an ordinal variable. Moreover, the Breusch Pagan test shows for all three models a p-value of 0.000. Thus, the H_0 of homoskedasticity is rejected. This suggests that there is heteroskedasticity in the OLS models. To control for this, I use robust standard errors.

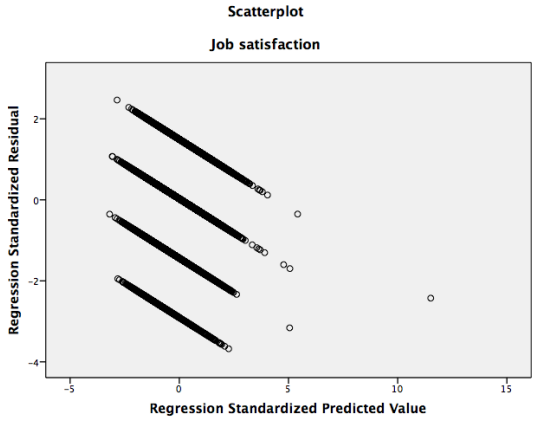

Figure 5: Job satisfaction

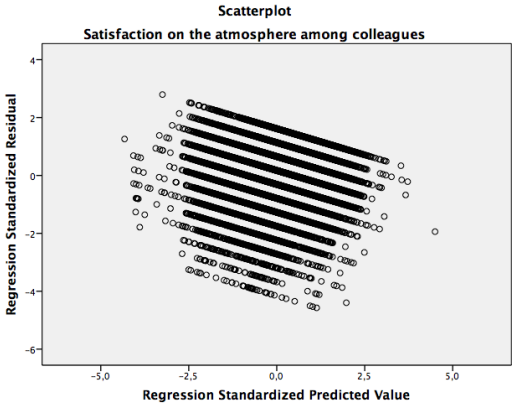

Figure 6: Satisfaction of the atmostphere among colleagues

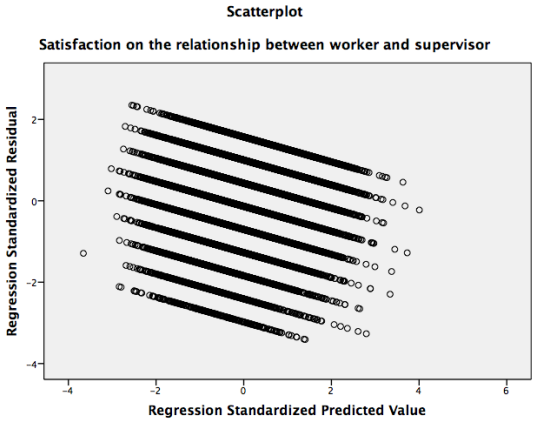

Figure 7: Satisfaction of the relationship between worker and supervisor

Secondly, the model must not suffer from perfect collinearity. To overcome this, I use the following dummies as reference group; male (gender), upper secondary education (ISCED 3) (level of education), an indefinite contract (kind of contract), alone (total amount of workers at workplace) and Belgium (country). The dummy variables male, upper secondary education (ISCED 3), an indefinite contract and Belgium are dropped out as these are the biggest groups. Alone (total amount of workers at workplace) is omitted because it could make the

interpretation easier. Thirdly, the model must not include multicollinearity. This is already shown in the correlation matrix, which shows that the correlations are quite small, and that there is presumably no multicollinearity. Finally, we need to check whether the error distribution is normally distributed (figure 8, 9 and 10). The model of satisfaction of the atmosphere among colleagues and the model of satisfaction of the relationship between worker and supervisor looks normal. However, the model on job satisfaction looks a bit messy and could suffer from non-normality. To conclude, it seems that some of the assumptions underlying the OLS model are violated. For this reason, I will use an ordered multinomial logit regression in addition to the OLS regression.

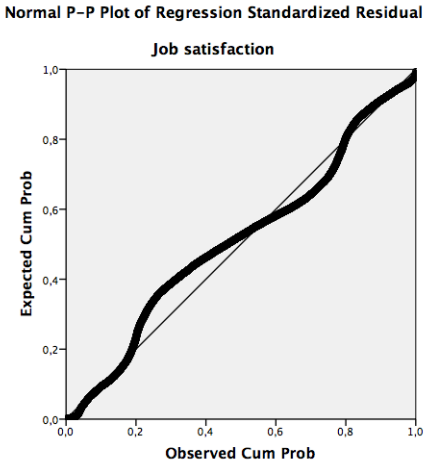

Figure 8: Job satisfaction

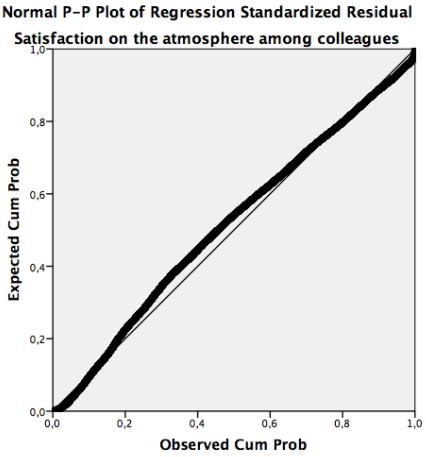

Figure 9: Satisfaction of the atmosphere among colleagues

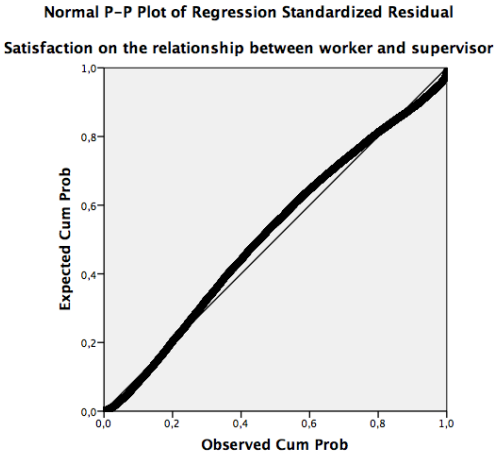

Figure 10: Satisfaction of the relationship between worker and supervisor

4. Results

This section presents the results following from the models explained in the previous section. Firstly, the OLS models will be discussed and the ordered multinomial logit models will be discussed in the second part. Both models will include three different regressions on job satisfaction, satisfaction of the atmosphere among colleagues and the satisfaction of the relationship between worker and supervisor.

4.1 OLS regressions

The results from the model with job satisfaction as the dependent variable can be found in table 5. In the first column only commuting time is included as the independent variable. In this case commuting time has a significant negative association of -0.047 on job satisfaction. In column 2, some standard demographics and the country dummies are added to the regression. By introducing these standard demographics and country dummies, the negative magnitude of commuting time becomes larger. The increase in the magnitude of this coefficient is mainly coming from adding country dummies and the level of education. When you are a female, you rate your job 0.001 higher on average than men do, but this is not significant. Also, age and household size show insignificant coefficients. Income per hour is significant with 0.004 and positively related to job satisfaction. Also, workers who have a lower level of education rate their job lower than workers who are middle educated (ISCED 3). The high educated workers rate their job higher than the middle educated workers. The country where the worker comes from has a big influence on job satisfaction. For example, a worker from Greece rates his job 0.371 lower in comparison to another worker from Belgium and a worker from Denmark rates his job 0.260 higher than a worker from Belgium. Thus, the job satisfaction of workers differs between Greece and Denmark with 0.631 point on average, on a 4-point Likert scale.

In the third column, some work related variables are added to the regression; years in the company, work hours per week, kind of contract and total amount of workers at workplace. These are added as control variables, in addition to the standard demographics added in column 2. Still the variable of interest, commuting time, is negatively and significantly related with job satisfaction with a coefficient of -0.060. By adding work related variables, the magnitude of the coefficient of commuting time gets smaller. Female, age and household size are still insignificant. However, income per hour is significant with a coefficient of 0.006. Level of education shows the same signs as in column 2. The coefficient of years in the company is

insignificant. Work hours per week has a significant and negative association with job satisfaction of -0.003. Workers with an indefinite contract are overall more satisfied with their job than workers with other kinds of contracts. Moreover, employees who work alone at their workplace are more satisfied than workers who work with more colleagues at their workplace. In column 4, the interaction term between tax deduction and commuting time is introduced. This interaction term is insignificant. Thus, when travel expenses are tax deductible for a worker, this worker will rate his job higher on average, in comparison to a worker who do not receive tax deduction on his travel expenses. However, this cannot be interpreted since this interaction term is not significant. The coefficient of commuting time changes from -0.060 towards -0.062, when introducing the interaction term.

In table 6, the dependent variable is satisfaction of the atmosphere among colleagues. In the first column, commuting time is again the only independent variable. The coefficient is -0.176 and significant at a 1%-level. In the second column, some standard demographics are added to the model. This makes the negative magnitude of the coefficient of commuting time larger. The variable female is significantly and negatively related to job satisfaction. Household size and income per hour show a positive and significant association with satisfaction of the atmosphere among colleagues. Level of education shows the same signs as under the OLS regression, where job satisfaction is the dependent variable. So, low educated workers show a negative relation with the dependent variable satisfaction of the atmosphere among colleagues, whereas higher educated workers show a positive relation with this dependent variable. In the third column, some work related variables are again added. These variables still show the same signs as in table 4, but only the magnitudes differ. The variable, total amount of workers at workplace, is the only variable that shows other coefficients. This is obviously coming from when you work alone, because you cannot be satisfied on the atmosphere among colleagues then. The interaction term between tax deduction and commuting time that is added in column 4, has a coefficient of -0.035 but is insignificant. The magnitude of the variable commuting time becomes smaller when including the interaction term. However, since the interaction is not significant, this is hard to interpret. In case the interaction term was significant, a one-hour increase in commuting time lead to a 0.151+0.035=0.186 lower job satisfaction. In comparison, without the interaction term a one-hour increase in commuting time lowers job satisfaction with 0.166.

The results from the regression with satisfaction of the relationship between worker and supervisor as dependent variable can be found in table 7. Commuting time is negatively and significantly (-0.137) associated with the satisfaction of the relationship between worker and supervisor. In column 2, some standard demographics are again included. The signs of these variables do also not differ from the previous regression. Only the significance levels of the variables differ, in comparison to the previous regression. Besides, the variable commuting time does not change in sign and still has a negative association of -0.148 with the satisfaction of the relationship between worker and supervisor. In the third column, the work related variables are included in the regression. The signs of these added variables remain the same as in the previous tables, only the magnitude differs. The interaction term which is introduced in the fourth column, is -0.075 and is significant at a 10% significance level. It changes the coefficient of commuting time from -0.128 to -0.097, which is significant. This means when commuting time of a workers increases with one hour and his travel expenses are tax deductible, that the worker rates the satisfaction of the relationship between worker and supervisor 0.172 lower on average. When commuting time of a workers increases with one hour and his travel expenses are not tax deductible, the worker rates the satisfaction of the relationship between worker and supervisor 0.097 lower on average. This means that workers without tax deduction are more satisfied with the relationship between worker and supervisor on average.

In this research, the dependent variable is a Likert scale variable in every case and thus an ordinal variable. OLS is for that reason probably not a good estimator, this already turns out when checking the assumptions of OLS in the previous section. Therefore, I also use a logit regression. These coefficients are harder to interpret, but I can compare them to the coefficients of the OLS regressions.

4.2 Ordered multinomial logit regressions

In table 8, the first ordered multinomial logit model on job satisfaction can be found. In the first column, only commuting time is included as explanatory variable. An increase of one hour in commuting time decreases significantly the probability of being satisfied with your job. In column 2, some standard demographic variables are added to the model. In this regression, the variable commuting time is negative and significant again. The coefficients of female, age and household size are insignificant. A one-hour increase in commuting time results in a decrease in the probability of being satisfied with your job. An increase of one euro in income per hour results in an increase in the probability of being satisfied with your job. This is significant at a

1%- level. The low educated workers face a decrease in the probability of being satisfied with their job, in comparison to the middle educated workers. On the other hand, high educated workers face an increase in the probability of being satisfied with their job satisfaction, in comparison to the middle educated workers. Also, the country dummies are included to control for cultural differences between the countries.

In the third column, again some work related variables are added to the model. An increase of one additional year in the company results in an increase in the probability of being satisfied with your job, but this is insignificant. Also, when your work hours per week increase with one hour, the probability of being satisfied with your job significantly decreases. Moreover, if you have a fixed term contract, a temporary employment agency contract or no contract with your firm, this results in a decrease in the probability of being satisfied with your job, in comparison to the workers with an indefinite contract. On the other hand, when you have an apprenticeship or other training scheme or other kind of contract than the mentioned contracts, the probability of being satisfied with your job significantly increases in comparison to workers with an indefinite contract. Workers who work alone at their workplace are more satisfied, than the workers who work with more colleagues at their workplace. In the fourth column, only the interaction term between tax deduction and commuting time is added to the regression. However, this coefficient is insignificant. The other coefficients of the variables remain the same in column 4. This ordered multinomial logit regression shows nearly the same results as under the OLS regression. The signs of the coefficients are the same, but only the magnitude differs.

The results of the ordered multinomial logit model on satisfaction of the atmosphere among colleagues can be found in table 9. A one-hour increase in commuting time decreases the probability of being satisfied with the atmosphere among colleagues significantly. In column 2, some standard demographics are again added to the model. A one-hour increase in commuting time is still significantly results in a lower probability of being satisfied with the atmosphere among colleagues. When being a female, this decreases the probability of being satisfied with the atmosphere among colleagues, compared to being a male. A one-euro increase in income per hour and one person more in a household results in an increase in the probability of being satisfied with the atmosphere among colleagues, which is significant. Level of education shows the same signs as in the model with job satisfaction as dependent variable. Note, not all of them are significant. In the third column the work related variables are added

to the model. An additional year in the company significantly results in an increase in the probability of being satisfied with the atmosphere among colleagues. Kind of contract shows the same signs as in the previous model with job satisfaction as dependent variable. These coefficients are all significant at a 5%-level. Obviously, when you work with colleagues this significantly increases the probability of being satisfied with the atmosphere among colleagues. In column 4, the interaction term tax deduction * commuting is added to the model. The coefficient is insignificant and this interaction term does not change the signs of the significant coefficients of the other variables. The ordered multinomial logit model shows the same results as in the OLS model on satisfaction of the atmosphere among colleagues.

In table 10, the ordered multinomial logit model on satisfaction of the relationship between worker and supervisor can be found. In the first column, only commuting time is included in the model. A one-hour increase in commuting time results in a decrease in the probability of being satisfied with the relationship between worker and supervisor. In the second column, the standard demographic variables and the country dummies are added to the model. The coefficients of female and age are not significant. An one person increase in the household size and an one euro increase in income per hour, increases the probability of being satisfied with the relationship between worker and supervisor. A lower level of education than middle educated results in a decrease in the probability of being satisfied on the relationship between worker and supervisor. A higher level of education than middle educated results in an increase in the probability of being satisfied on the relationship between worker and supervisor. In column 3, the work related variables are added to the model. These variables again show the same signs as in the ordered multinomial logit model on job satisfaction and also on the satisfaction of the atmosphere among colleagues. These variables all show significant coefficients. The interaction term tax deduction * commuting time is added in column 4. This coefficient is negative and significant. Thus, a worker with tax deduction on travel expenses and with the same commuting time, as other workers without tax deduction on travel expenses, has a lower satisfaction of the relationship between worker and supervisor on average. Again, this ordered multinomial logit model shows the same results as in the OLS model on the satisfaction of the atmosphere among colleagues.

Overall, I find a negative association between commuting time and job satisfaction, satisfaction of the atmosphere among colleagues and satisfaction of the relationship between worker and supervisor. These results hold for both the OLS model and the ordered multinomial logit model.

The relation between tax deduction on travel expenses and job satisfaction is not significant. The relation between tax deduction on travel expenses and the satisfaction of the atmosphere among colleagues is also not significant. However, the relation between tax deduction on travel expenses and the satisfaction of the relationship between worker and supervisor is negative and significant at a 10%- level in the OLS regression and significant at a 5%-level in the ordered multinomial logit regression.

5. Conclusion

In this thesis, I researched the relation between commuting and job satisfaction and also the relation between tax deduction on travel expenses and job satisfaction. Since there was hardly no evidence on both relations, I wanted to investigate these in this thesis. I used data from the European Working Conditions Survey (EWCS) of 2010 from Eurofound and the PwC Worldwide Tax Summaries Online to discover this.

As folllows from the results, there seems to be a negative and significant relation between commuting time and job satisfaction. This supports the first hypothesis of a negative association between commuting and job satisfaction. The research question can also be answered: "*What is the relation between commuting time and job satisfaction*?". The results show, that there seems to be a negative relation between commuting time and job satisfaction. This indicates, that there are more workers who get a lower job satisfaction, when they have to commute longer. Besides, there are less workers who commute longer, because they find their job worth it to travel so long. This is in line with the related literature. The results also show a negative and significant relation between commuting and the satisfaction of the atmosphere among colleagues, and also with the satisfaction of the relationship between worker and supervisor. These negative relations give no support for the second and third hypothesis of no association between commuting and the two aspects of a job (atmosphere among colleagues and relationship between worker and supervisor).

The relation between tax deduction on travel expenses and job satisfaction is not significant. Moreover, the relation between tax deduction on travel expenses and the satisfaction of the atmosphere among colleagues is also not significant. Thus, there is no evidence for hypothesis four and five. The relation between tax deduction on travel expenses and the satisfaction of the relationship between worker and supervisor is negative and significant. This is contrary to hypothesis six, which predicts no association between these variables.

A limitation of this research is that no data was available per person, if they receive tax deduction on travel expenses or not. The tax deduction variable is on the country level, but it would have been better if this was available per respondent. In that case, tax deduction on travel expenses could be used as an independent variable, instead of an interaction term with commuting time. Moreover, only the commuting time is present in the data, not the transport

type. Another limitation is the low response rate of 44,2%. The individuals are visited for a maximum of three times to get in contact. There is a big chance that the workers who work relatively more than average or commute more on average, are not represented in this sample. Since these workers are less often at home, there is a bigger chance that they were not at home at the time of the three visits, in comparison to the workers who work and/or commute less.

In this thesis, I only researched the relation between commuting time on job satisfaction, satisfaction of the atmosphere among colleagues and satisfaction of the relationship between worker and supervisor. It would be interesting for future research to also investigate others aspects of the job. Especially, satisfaction on the content of the work would be interesting. Moreover, I only researched commuting time. It turns out from related research that also the type of transport also matters (Koslowsky & Krauz, 1993; Gatersleven & Uzzell, 2007; St-Louis et al.; 2014). Future research is required, to investigate the influence of the different transport types on job satisfaction.

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7. Appendix

Table 1: Descriptive statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Job satisfaction in general	43,268	1	4	2.99	0.741
- Very satisfied	*9,894*	*0*	*1*	*22,9%*	*0.420*
- Satisfied	*24,674*	*0*	*1*	*57,0%*	*0.495*
- Not very satisfied	*6,976*	*0*	*1*	*16,1%*	*0.368*
- Not at all satisfied	*1,724*	*0*	*1*	*4,0%*	*0.196*
Your colleagues help and support you	38,011	1	5	2.03	1.069
- Always	*14,279*	*0*	*1*	*37,6%*	*0.484*
- Most of the time	*13,500*	*0*	*1*	*35,5%*	*0.479*
- Sometimes	*6,667*	*0*	*1*	*17,5%*	*0.380*
- Rarely	*1,914*	*0*	*1*	*5,0%*	*0.219*
- Never	*1,651*	*0*	*1*	*4,3%*	*0.204*
I feel 'at home' in this organization	42,345	1	5	3.77	1.055
- Strongly agree	*10,555*	*0*	*1*	*24,9%*	*0.433*
- Agree	*18,832*	*0*	*1*	*44,5%*	*0.497*
- Neither agree nor disagree	*7,382*	*0*	*1*	*17,4%*	*0.379*
- Disagree	*3,735*	*0*	*1*	*8,8%*	*0.284*
- Strongly disagree	*1,841*	*0*	*1*	*4,3%*	*0.204*
I have very good friends at work	40,462	1	5	3.89	0.951
- Strongly agree	*10,571*	*0*	*1*	*26,1%*	*0.439*
- Agree	*19,816*	*0*	*1*	*49,0%*	*0.500*
- Neither agree nor disagree	*6,344*	*0*	*1*	*15,7%*	*0.364*
- Disagree	*2,691*	*0*	*1*	*6,7%*	*0.249*
- Strongly disagree	*1,040*	*0*	*1*	*2,6%*	*0.158*
Your manager help and support you	33,685	1	5	2.28	1.184
- Always	*10,492*	*0*	*1*	*31,1%*	*0.457*
- Most of the time	*10,705*	*0*	*1*	*31,8%*	*0.459*
- Sometimes	*7,046*	*0*	*1*	*20,9%*	*0.399*
- Rarely	*3,325*	*0*	*1*	*9,9%*	*0.292*
- Never	*2,117*	*0*	*1*	*6,3%*	*0.237*
The organization I work for motivates me to give my best job performance	40,263	1	5	3.58	1,083
- Strongly agree	*7,697*	*0*	*1*	*19,1%*	*0.393*
- Agree	*16,900*	*0*	*1*	*42,0%*	*0.494*
- Neither agree nor disagree	*8,936*	*0*	*1*	*22,2%*	*0.416*
- Disagree	*4,586*	*0*	*1*	*11,4%*	*0.318*
- Strongly disagree	*2,144*	*0*	*1*	*5,3%*	*0.225*
Commuting time	39,408	1	360	41.29	33.985
Gender	43,816	1	2	1.48	0.500
Age	43,525	15	91	41.68	12.159
Income per hour	29,125	0	465	8.25	10.21
Level of education	43,695	0	6	3.32	1.280
- Pre-primary education	*239*	*0*	*1*	*0,5%*	*0.074*
- Primary education (ISCED 1)	*2,505*	*0*	*1*	*5,7%*	*0.232*
- Lower secondary education (ISCED 2)	*8402*	*0*	*1*	*19,2%*	*0.394*

- Upper secondary education (ISCED 3)	*17,790*	*0*	*1*	*40,7%*	*0.491*
- Post-secundary education (ISCED 4)	*1890*	*0*	*1*	*4,3%*	*0.203*
- Tertiary education - first level (ISCED 5)	*12,461*	*0*	*1*	*28,5%*	*0.452*
- Tertiary education - advanced level (ISCED 6)	*408*	*0*	*1*	*0,9%*	*0.096*
Amount of years employed at specific company	42,714	0	70	10.03	9.910
Household size	43,796	1	16	3.08	1.466
Work hours per week	42,480	1	168	39.10	13.250
Kind of contract	34,984	1	6	1.55	1.233
- An indefinite contract	*26,842*	*0*	*1*	*76,7%*	*0.423*
- A fixed term contract	*4,106*	*0*	*1*	*11,7%*	*0.322*
- A temporary employment agency contract	*510*	*0*	*1*	*1,5%*	*0.120*
- An apprenticeship or other training scheme	*185*	*0*	*1*	*0,5%*	*0.073*
- No contract	*3,052*	*0*	*1*	*8,7%*	*0.282*
- Other	*289*	*0*	*1*	*0,8%*	*0.091*
Total amount of workers at workplace	42,475	1	8	3.73	1.914
- Alone	*5,661*	*0*	*1*	13,3%	*0.340*
- 2-4	*7,034*	*0*	*1*	16,6%	*0.372*
- 5-9	*6,260*	*0*	*1*	14,7%	*0.354*
- 10-49	*11,856*	*0*	*1*	27,9%	*0.449*
- 50-99	*4,110*	*0*	*1*	9,7%	*0.296*
- 100-249	*3,370*	*0*	*1*	7,9%	*0.270*
- 250-499	*1,608*	*0*	*1*	3,8%	*0.191*
- 500 and over	*2,576*	*0*	*1*	6,1%	*0.239*

Table 2: Descriptive statistics

	Countries with tax deduction			Countries without tax deduction		
	N	Mean	Std. Deviation	N	Mean	Std. Deviation
Job satisfaction in general	15,182			28,086		
- Very satisfied		*29,0%*	*0.454*		*19,6%*	*0.397*
- Satisfied		*58,4%*	*0.493*		*56,3%*	*0.496*
- Not very satisfied		*10,5%*	*0.306*		*19,2%*	*0.394*
- Not at all satisfied		*2,1%*	*0.144*		*5,0%*	*0.218*
Your colleagues help and support you	13,668			24,343		
- Always		35%	0.478		39%	0.487
- Most of the time		36%	0.481		35%	0.477
- Sometimes		18%	0.385		17%	0.378
- Rarely		5%	0.227		5%	0.214
- Never		5%	0.213		4%	0.199
I feel 'at home' in this organization	14,993			27,352		
- Strongly agree		29%	0.454		23%	0.419
- Agree		48%	0.500		42%	0.494
- Neither agree nor disagree		14%	0.344		19%	0.396
- Disagree		6%	0.232		11%	0.307
- Strongly disagree		3%	0.180		5%	0.216

I have very good friends at work	14,435			26,027		
- Strongly agree		27%	0.172		26%	0.438
- Agree		46%	0.272		51%	0.500
- Neither agree nor disagree		16%	0.368		15%	0.361
- Disagree		8%	0.499		6%	0.235
- Strongly disagree		3%	0.442		2%	0.150
Your manager help and support you	13,176			22,196		
- Always		24%	0.428		33%	0.470
- Most of the time		30%	0.456		31%	0.461
- Sometimes		21%	0.405		19%	0.396
- Rarely		12%	0.323		8%	0.271
- Never		8%	0.272		5%	0.213
The organization I work for motivates me to give my best job performance	14,571			25,692		
- Strongly agree		21%	0.410		18%	0.383
- Agree		45%	0.498		40%	0.490
- Neither agree nor disagree		19%	0.392		24%	0.427
- Disagree		10%	0.302		12%	0.326
- Strongly disagree		4%	0.205		6%	0.235
Commuting time	13,895	44.75	35.116	25,513	39.41	33.203
Gender	15,301	1.50	0.500	28,515	1.47	0.499
Age	15,215	41.72	12.034	28,410	41.66	12.225
Income per hour	10,669	12.70	10.008	18,456	5.686	9.411
Level of education	15,242			28,453		
- Pre-primary education		*0,6%*	*0.080*		*0,5%*	*0.070*
- Primary education (ISCED 1)		*2,4%*	*0.154*		*7,5%*	*0.263*
- Lower secondary education (ISCED 2)		*20,5%*	*0.404*		*18,6%*	*0.389*
- Upper secondary education (ISCED 3)		*38,2%*	*0.486*		*42,0%*	*0.494*
- Post-secundary education (ISCED 4)		*2,4%*	*0.153*		*5,4%*	*0.225*
- Tertiary education - first level (ISCED 5)		*34,4%*	*0.475*		*25,4%*	*0.435*
- Tertiary education - advanced level (ISCED 6)		*1,5%*	*0.120*		*0,7%*	*0.081*
Amount of years employed at specific company	14,990	10.33	9.985	27,724	9.87	9.866
Household size	15,285	2.72	1.344	28,511	3.28	1.491
Work hours per week	14,992	36.00	12.004	27,488	40.79	13.588
Kind of contract	12,949			22,035		
- An indefinite contract		*84,2%*	*0.364*		*72,3%*	*0.447*
- A fixed term contract		*10,2%*	*0.302*		*12,7%*	*0.332*
- A temporary employment agency contract		*2,0%*	*0.139*		*1,2%*	*0.107*
- An apprenticeship or other training scheme		*0,8%*	*0.089*		*0,4%*	*0.061*
- No contract		*2,1%*	*0.142*		*12,6%*	*0.332*
- Other		*0,8%*	*0.087*		*0.9%*	*0.093*

Total amount of workers at workplace	14,831			27,644		
- Alone		*10,2%*	*0.303*		*15,0%*	*0.357*
- 2-4		*12,6%*	*0.332*		*18,7%*	*0.390*
- 5-9		*15,0%*	*0.357*		*14,6%*	*0.353*
- 10-49		*28,8%*	*0.453*		*27,4%*	*0.446*
- 50-99		*10,6%*	*0.308*		*9,2%*	*0.289*
- 100-249		*9,4%*	*0.292*		*7,1%*	*0.257*
- 250-499		*5,0%*	*0.219*		*3,1%*	*0.174*
- 500 and over		*8,3%*	*0.275*		*4,9%*	*0.215*

Table 3: Correlation matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Job satisfaction in general	1																
2. Your colleagues help and support you	.188**	1															
3. I feel 'at home' in this organization	.446**	.231**	1														
4. I have very good friends at work	.232**	.323**	.432**	1													
5. Your manager help and support you	.289**	.555**	.328**	.268**	1												
6. The organization I work for motivates me to give my best job performance	.427**	.229**	.543**	.352**	.336**	1											
7. Commuting time	-.037**	.005	-.068**	-.030**	-.035**	-.045**	1										
8. Tax deduction on travel expenses	.154**	-.034**	.120**	-.033**	-.121**	.075**	.066**	1									
9. Gender	.033**	-.001	.021**	-.021**	.016**	.009	-.025**	.026**	1								
10. Age	.026**	-.035**	.094**	.016**	.009	.027**	-.030**	.002	.009	1							
11. Income per hour	.183**	.029**	.146**	.039**	.021**	.122**	.049**	.331**	-.018**	.103**	1						
12. Level of education	.148**	.057**	.087**	.031**	.091**	.102**	.101**	.093**	.081**	-.073**	.188**	1					
13. Amount of years employed at specific company	.017**	.020**	.120**	.090**	.013*	.044**	-.027**	.022**	-.051**	.552**	.087**	-.048**	1				
14. Household size	-.080**	.030**	-.009	.051**	.039**	.009	-.035**	-.184**	-.069**	-.155**	-.119**	-.056**	-.053**	1			
15. Work hours per week	-.110**	.000	-.035**	.006	-.017**	-.009	.005	-.173**	-.228**	-.038**	-.271**	-.040**	.050**	.108**	1		
16. Kind of contract	-.089**	-.027**	-.100**	-.037**	-.005	-.051**	-.052**	-.166**	.036**	-.135**	-.105**	-.141**	-.180**	.067**	.006	1	
17. Total amount of workers at workplace	.026**	.070**	-.059**	.069**	-.031**	-.043**	.243**	.128**	.000	-.014**	.135**	.179**	.089**	-.046**	-.068**	-.201**	1

Notes: **. And *. Correlation is significant at the 0.01 level and 0.05 level, respectively.

Table 4: Countries with and without tax deduction

Tax deduction on travel expenses:	No tax deduction on travel expenses:
Belgium	Bulgaria
Denmark	Czech Republic
Germany	Estonia
France	Greece
Luxembourg	Spain
The Netherlands	Ireland
Austria	Italy
Finland	Cyprus
Sweden	Latvia
	Lithuania
	Hungary
	Malta
	Poland
	Portugal
	Romania
	Slovenia
	Slovakia
	United Kingdom
	Croatia
	Fyrom
	Turkey
	Norway
	Albania
	Montenegro

Table 5: OLS regression on job satisfaction

	(1) Job satisfaction	(2) Job satisfaction	(3) Job satisfaction	(4) Job satisfaction
Commuting time (hour)	-0.047***	-0.078***	-0.060***	-0.062***
	(0.006)	(0.008)	(0.008)	(0.011)
Tax deduction x commuting time				0.006
				(0.017)
Female		0.001	-0.013	-0.013
		(0.009)	(0.009)	(0.009)
Age (years)		-0.000	-0.000	-0.000
		(0.000)	(0.000)	(0.000)
Household size		-0.002	0.001	0.001
		(0.002)	(0.003)	(0.003)
Income per hour (€)		0.004***	0.006***	0.006***
		(0.001)	(0.001)	(0.001)
Level of education:				
- Pre-primary education		-0.123**	-0.149***	-0.149***
		(0.051)	(0.057)	(0.057)
- Primary education (ISCED 1)		-0.132***	-0.103***	-0.103***
		(0.021)	(0.024)	(0.024)
- Lower Secondary eduction (ISCED 2)		-0.052***	-0.047***	-0.047***
		(0.013)	(0.014)	(0.014)
- Post-secundary education (ISCED 4)		0.033	0.034	0.034

	(0.020)	(0.022)	(0.022)
- Tertiary education - first level (ISCED 5)	0.140***	0.133***	0.133***
	(0.010)	(0.011)	(0.011)
- Tertiary education - advanced level (ISCED 6)	0.131***	0.138***	0.138***
	(0.042)	(0.047)	(0.047)
Years in company		0.000	0.000
		(0.000)	(0.000)
Work hours per week		-0.003***	-0.003***
		(0.001)	(0.001)
Kind of contract:			
- A fixed term contract		-0.058***	-0.058***
		(0.015)	(0.015)
- A temporary employment agency contract		-0.083**	-0.083**
		(0.039)	(0.039)
- An apprenticeship or other training scheme		0.194***	0.194***
		(0.048)	(0.048)
- No contract		-0.114***	-0.114***
		(0.020)	(0.020)
- Other		0.054	0.054
		(0.049)	(0.049)
Total amount of workers at workplace:			
- Work with 2 to 4		-0.034	-0.034
		(0.028)	(0.028)
- Work with 5 to 9		-0.069**	-0.069**
		(0.027)	(0.027)
- Work with 10 to 49		-0.102***	-0.102***
		(0.026)	(0.026)
- Work with 50 to 99		-0.133***	-0.134***
		(0.029)	(0.029)
- Work with 100 to 249		-0.120***	-0.120***
		(0.029)	(0.029)
- Work with 250 to 499		-0.144***	-0.144***
		(0.033)	(0.033)
- Work with 500 and over		-0.158***	-0.158***
		(0.031)	(0.031)
Country:			
- Bulgaria	-0.231***	-0.163***	-0.158***
	(0.035)	(0.037)	(0.039)
- Czech Republic	-0.206***	-0.185***	-0.181***
	(0.030)	(0.033)	(0.035)
- Denmark	0.260***	0.273***	0.273***
	(0.026)	(0.028)	(0.028)
- Germany	0.008	0.011	0.011
	(0.023)	(0.024)	(0.024)
- Estonia	-0.224***	-0.184***	-0.179***
	(0.034)	(0.035)	(0.037)
- Greece	-0.371***	-0.284***	-0.280***
	(0.041)	(0.046)	(0.047)
- Spain	-0.136***	-0.117***	-0.113***
	(0.035)	(0.037)	(0.039)
- France	-0.217***	-0.220***	-0.220***
	(0.022)	(0.023)	(0.023)
- Ireland	0.071**	0.106***	0.111***
	(0.029)	(0.032)	(0.034)

- Italy		-0.231***	-0.213***	-0.209***
		(0.032)	(0.035)	(0.036)
- Cyprus		0.148***	0.244***	0.249***
		(0.039)	(0.042)	(0.043)
- Latvia		-0.303***	-0.251***	-0.246***
		(0.030)	(0.032)	(0.034)
- Lithuania		-0.397***	-0.375***	-0.371***
		(0.032)	(0.034)	(0.036)
- Luxembourg		-0.136***	-0.139***	-0.139***
		(0.045)	(0.048)	(0.048)
- Hungary		-0.373***	-0.305***	-0.300***
		(0.033)	(0.035)	(0.037)
- Malta		0.042	0.105***	0.109***
		(0.038)	(0.040)	(0.042)
- Netherlands		0.028	0.023	0.023
		(0.026)	(0.028)	(0.028)
- Austria		0.083***	0.102***	0.102***
		(0.029)	(0.030)	(0.030)
- Poland		-0.132***	-0.055*	-0.051
		(0.028)	(0.030)	(0.032)
- Portugal		-0.050	-0.038	-0.034
		(0.031)	(0.034)	(0.035)
- Romania		-0.215***	-0.090***	-0.086**
		(0.033)	(0.035)	(0.037)
- Slovenia		-0.362***	-0.333***	-0.329***
		(0.028)	(0.030)	(0.033)
- Slovakia		-0.205***	-0.167***	-0.163***
		(0.031)	(0.034)	(0.036)
- Finland		-0.075***	-0.059**	-0.059**
		(0.025)	(0.027)	(0.027)
- Sweden		-0.028	-0.005	-0.005
		(0.028)	(0.030)	(0.030)
- United Kingdom		0.175***	0.193***	0.198***
		(0.028)	(0.031)	(0.033)
- Croatia		-0.129***	-0.112***	-0.108***
		(0.033)	(0.035)	(0.037)
- FYROM		-0.442***	-0.350***	-0.346***
		(0.038)	(0.041)	(0.043)
- Turkey		-0.414***	-0.314***	-0.310***
		(0.027)	(0.033)	(0.035)
- Norway		0.107***	0.130***	0.134***
		(0.028)	(0.029)	(0.031)
- Albania		-0.527***	-0.293***	-0.289***
		(0.038)	(0.044)	(0.045)
- Kosovo		-0.387***	-0.256***	-0.252***
		(0.034)	(0.040)	(0.041)
- Montenegro		-0.318***	-0.242***	-0.238***
		(0.039)	(0.041)	(0.043)
Constant	3.021***	3.112***	3.285***	3.283***
	(0.005)	(0.026)	(0.045)	(0.045)
N	42318	28457	23649	23649
r2	0.001	0.106	0.104	0.104
p	0.000	0.000	0.000	0.000

Standard errors in parentheses
* $p < .1$, ** $p < .05$, *** $p < .01$

Table 6: OLS regression satisfaction of the atmosphere among colleagues

	(1) Satisfaction of the atmosphere among colleagues	(2) Satisfaction of the atmosphere among colleagues	(3) Satisfaction of the atmosphere among colleagues	(4) Satisfaction of the atmosphere among colleagues
Commuting time (hour)	-0.176***	-0.186***	-0.166***	-0.151***
	(0.021)	(0.025)	(0.026)	(0.033)
Tax deduction x commuting time				-0.035
				(0.052)
Female		-0.058**	-0.034	-0.034
		(0.028)	(0.029)	(0.029)
Age (years)		-0.000	-0.001*	-0.001*
		(0.000)	(0.000)	(0.000)
Household size		0.024***	0.023***	0.023***
		(0.008)	(0.008)	(0.008)
Income per hour (€)		0.009***	0.008**	0.008**
		(0.003)	(0.003)	(0.003)
Level of education:				
- Pre-primary education		-0.404**	-0.274	-0.277
		(0.172)	(0.173)	(0.173)
- Primary education (ISCED 1)		-0.095	-0.061	-0.061
		(0.073)	(0.075)	(0.075)
- Lower Secondary eduction (ISCED 2)		-0.092**	-0.115***	-0.115***
		(0.042)	(0.043)	(0.043)
- Post-secundary education (ISCED 4)		0.263***	0.174***	0.174***
		(0.064)	(0.065)	(0.065)
- Tertiary education - first level (ISCED 5)		0.174***	0.150***	0.151***
		(0.033)	(0.034)	(0.034)
- Tertiary education - advanced level (ISCED 6)		0.234*	0.196	0.197
		(0.131)	(0.133)	(0.133)
Years in company			0.012***	0.012***
			(0.001)	(0.001)
Work hours per week			-0.002	-0.002
			(0.002)	(0.002)
Kind of contract:				
- A fixed term contract			-0.297***	-0.297***
			(0.046)	(0.046)
- A temporary employment agency contract			-0.364***	-0.365***
			(0.130)	(0.130)
- An apprenticeship or other training scheme			0.653***	0.652***
			(0.140)	(0.141)
- No contract			-0.305***	-0.305***
			(0.065)	(0.065)
- Other			0.305**	0.306**
			(0.153)	(0.153)
Total amount of workers at workplace:				
- Work with 2 to 4			1.346***	1.348***
			(0.137)	(0.137)
- Work with 5 to 9			1.421***	1.422***

		(0.135)	(0.135)
- Work with 10 to 49		1.261***	1.261***
		(0.133)	(0.133)
- Work with 50 to 99		1.161***	1.162***
		(0.137)	(0.137)
- Work with 100 to 249		1.072***	1.073***
		(0.139)	(0.139)
- Work with 250 to 499		1.106***	1.106***
		(0.145)	(0.145)
- Work with 500 and over		1.094***	1.094***
		(0.141)	(0.141)
Country:			
- Bulgaria	-0.093	0.010	-0.016
	(0.110)	(0.112)	(0.118)
- Czech Republic	-0.846***	-0.939***	-0.965***
	(0.101)	(0.105)	(0.111)
- Denmark	0.652***	0.680***	0.679***
	(0.081)	(0.083)	(0.083)
- Germany	-0.519***	-0.587***	-0.588***
	(0.082)	(0.084)	(0.084)
- Estonia	-0.274**	-0.270**	-0.297**
	(0.120)	(0.121)	(0.127)
- Greece	-0.390***	-0.375***	-0.400***
	(0.127)	(0.137)	(0.142)
- Spain	-0.249**	-0.238**	-0.264**
	(0.108)	(0.112)	(0.119)
- France	-0.589***	-0.586***	-0.587***
	(0.075)	(0.077)	(0.077)
- Ireland	0.491***	0.620***	0.593***
	(0.095)	(0.098)	(0.105)
- Italy	-1.316***	-1.407***	-1.431***
	(0.104)	(0.110)	(0.115)
- Cyprus	0.272**	0.204	0.180
	(0.117)	(0.125)	(0.129)
- Latvia	-0.200*	-0.210**	-0.238**
	(0.104)	(0.107)	(0.114)
- Lithuania	-1.383***	-1.406***	-1.431***
	(0.111)	(0.111)	(0.118)
- Luxembourg	-0.347**	-0.325*	-0.327*
	(0.161)	(0.168)	(0.168)
- Hungary	-0.022	0.062	0.034
	(0.108)	(0.108)	(0.115)
- Malta	0.934***	0.988***	0.964***
	(0.101)	(0.106)	(0.111)
- Netherlands	-0.533***	-0.398***	-0.397***
	(0.091)	(0.094)	(0.094)
- Austria	-0.471***	-0.486***	-0.489***
	(0.102)	(0.102)	(0.102)
- Poland	-0.790***	-0.734***	-0.760***
	(0.098)	(0.101)	(0.108)
- Portugal	0.316***	0.173	0.151
	(0.108)	(0.112)	(0.117)
- Romania	-0.148	-0.095	-0.123
	(0.108)	(0.110)	(0.116)
- Slovenia	-0.382***	-0.469***	-0.494***
	(0.091)	(0.094)	(0.102)

- Slovakia		-0.845***	-0.896***	-0.920***
		(0.104)	(0.108)	(0.115)
- Finland		0.362***	0.394***	0.392***
		(0.083)	(0.085)	(0.085)
- Sweden		0.498***	0.442***	0.442***
		(0.087)	(0.090)	(0.090)
- United Kingdom		0.642***	0.711***	0.684***
		(0.089)	(0.091)	(0.099)
- Croatia		0.066	-0.026	-0.052
		(0.097)	(0.101)	(0.107)
- FYROM		-0.432***	-0.417***	-0.442***
		(0.114)	(0.120)	(0.126)
- Turkey		-1.407***	-1.413***	-1.439***
		(0.090)	(0.101)	(0.108)
- Norway		0.624***	0.640***	0.616***
		(0.080)	(0.083)	(0.090)
- Albania		-0.244**	-0.190	-0.215
		(0.121)	(0.131)	(0.136)
- Kosovo		0.769***	1.202***	1.178***
		(0.098)	(0.106)	(0.111)
- Montenegro		-0.299**	-0.245**	-0.267**
		(0.120)	(0.125)	(0.129)
Constant	11.785***	11.882***	10.629***	10.644***
	(0.019)	(0.082)	(0.172)	(0.174)
N	36319	25106	22544	22544
r2	0.002	0.087	0.112	0.112
p	0.000	0.000	0.000	0.000

Standard errors in parentheses
* $p < .1$, ** $p < .05$, *** $p < .01$

Table 7: OLS regression on satisfaction of the relationship between worker and supervisor

	(1) Satisfaction of the relationship between worker and supervisor	(2) Satisfaction of the relationship between worker and supervisor	(3) Satisfaction of the relationship between worker and supervisor	(4) Satisfaction of the relationship between worker and supervisor
Commuting time (hour)	-0.137***	-0.148***	-0.128***	-0.097***
	(0.019)	(0.022)	(0.023)	(0.029)
Tax deduction x commuting time				-0.075*
				(0.045)
Female		0.049**	0.034	0.033
		(0.024)	(0.025)	(0.025)
Age (years)		-0.001**	-0.001*	-0.001*
		(0.000)	(0.000)	(0.000)
Household size		0.005	0.006	0.006
		(0.008)	(0.008)	(0.008)
Income per hour (€)		0.010***	0.010***	0.010***
		(0.002)	(0.002)	(0.002)
Level of education:				

- Pre-primary education	-0.235	-0.340**	-0.345**
	(0.147)	(0.147)	(0.147)
- Primary education (ISCED 1)	-0.258***	-0.228***	-0.227***
	(0.062)	(0.062)	(0.062)
- Lower Secondary eduction (ISCED 2)	-0.202***	-0.198***	-0.198***
	(0.036)	(0.036)	(0.036)
- Post-secundary education (ISCED 4)	0.117**	0.096*	0.097*
	(0.055)	(0.056)	(0.056)
- Tertiary education - first level (ISCED 5)	0.215***	0.227***	0.229***
	(0.028)	(0.028)	(0.028)
- Tertiary education - advanced level (ISCED 6)	0.355***	0.428***	0.430***
	(0.117)	(0.116)	(0.116)
Years in company		0.002**	0.002**
		(0.001)	(0.001)
Work hours per week		-0.003**	-0.003**
		(0.001)	(0.001)
Kind of contract:			
- A fixed term contract		-0.087**	-0.087**
		(0.037)	(0.037)
- A temporary employment agency contract		-0.276***	-0.278***
		(0.098)	(0.098)
- An apprenticeship or other training scheme		0.494***	0.493***
		(0.118)	(0.118)
- No contract		-0.254***	-0.254***
		(0.053)	(0.053)
- Other		0.100	0.102
		(0.122)	(0.122)
Total amount of workers at workplace:			
- Work with 2 to 4		0.483***	0.485***
		(0.082)	(0.082)
- Work with 5 to 9		0.417***	0.417***
		(0.081)	(0.081)
- Work with 10 to 49		0.234***	0.235***
		(0.078)	(0.078)
- Work with 50 to 99		0.086	0.087
		(0.083)	(0.083)
- Work with 100 to 249		0.076	0.077
		(0.085)	(0.085)
- Work with 250 to 499		0.017	0.018
		(0.094)	(0.094)
- Work with 500 and over		0.026	0.026
		(0.089)	(0.089)
Country:			
- Bulgaria	0.371***	0.392***	0.336***
	(0.095)	(0.097)	(0.103)
- Czech Republic	-0.198**	-0.202**	-0.258***
	(0.085)	(0.085)	(0.091)
- Denmark	0.608***	0.623***	0.622***
	(0.071)	(0.072)	(0.072)
- Germany	-0.425***	-0.457***	-0.459***
	(0.069)	(0.070)	(0.070)
- Estonia	-0.005	-0.008	-0.066
	(0.105)	(0.106)	(0.111)
- Greece	0.296***	0.316***	0.263**

		(0.105)	(0.107)	(0.111)
- Spain		0.321***	0.289***	0.233**
		(0.100)	(0.102)	(0.107)
- France		-0.346***	-0.351***	-0.353***
		(0.064)	(0.066)	(0.066)
- Ireland		0.718***	0.792***	0.734***
		(0.083)	(0.084)	(0.091)
- Italy		-0.756***	-0.763***	-0.814***
		(0.089)	(0.091)	(0.096)
- Cyprus		0.999***	1.019***	0.968***
		(0.096)	(0.099)	(0.104)
- Latvia		-0.028	-0.026	-0.086
		(0.090)	(0.092)	(0.098)
- Lithuania		-0.525***	-0.555***	-0.609***
		(0.090)	(0.091)	(0.097)
- Luxembourg		-0.300**	-0.287**	-0.291**
		(0.132)	(0.134)	(0.135)
- Hungary		0.225**	0.292***	0.232**
		(0.094)	(0.093)	(0.099)
- Malta		1.153***	1.232***	1.181***
		(0.089)	(0.092)	(0.097)
- Netherlands		0.110	0.119	0.121
		(0.079)	(0.080)	(0.080)
- Austria		-0.160*	-0.139	-0.146
		(0.089)	(0.089)	(0.089)
- Poland		-0.368***	-0.345***	-0.402***
		(0.083)	(0.084)	(0.091)
- Portugal		0.728***	0.712***	0.664***
		(0.086)	(0.087)	(0.092)
- Romania		0.214**	0.258***	0.198**
		(0.092)	(0.094)	(0.100)
- Slovenia		0.087	0.112	0.058
		(0.076)	(0.077)	(0.084)
- Slovakia		-0.373***	-0.379***	-0.433***
		(0.090)	(0.091)	(0.096)
- Finland		0.439***	0.414***	0.411***
		(0.074)	(0.075)	(0.075)
- Sweden		0.131	0.153*	0.152*
		(0.080)	(0.082)	(0.082)
- United Kingdom		0.565***	0.647***	0.589***
		(0.081)	(0.082)	(0.089)
- Croatia		0.141	0.104	0.050
		(0.086)	(0.087)	(0.092)
- FYROM		0.116	0.095	0.040
		(0.102)	(0.103)	(0.108)
- Turkey		-0.535***	-0.432***	-0.490***
		(0.077)	(0.085)	(0.091)
- Norway		0.544***	0.566***	0.513***
		(0.072)	(0.073)	(0.079)
- Albania		0.015	0.063	0.009
		(0.104)	(0.107)	(0.111)
- Kosovo		0.984***	1.003***	0.953***
		(0.087)	(0.091)	(0.096)
- Montenegro		0.001	-0.007	-0.057
		(0.101)	(0.103)	(0.107)
Constant	7.361***	7.092***	6.967***	6.999***

	(0.016)	(0.072)	(0.122)	(0.123)
N	32638	23220	22695	22695
r2	0.002	0.076	0.085	0.085
p	0.000	0.000	0.000	0.000

Standard errors in parentheses
* $p < .1$, ** $p < .05$, *** $p < .01$

Table 8: Ordered multinomial LOGIT regression on job satisfaction

	(1) Job satisfaction	(2) Job satisfaction	(3) Job satisfaction	(4) Job satisfaction
Commuting time (hour)	-0.126***	-0.220***	-0.170***	-0.173***
	(0.017)	(0.021)	(0.024)	(0.032)
Tax deduction x commuting time				0.008
				(0.049)
Female		0.011	-0.036	-0.036
		(0.024)	(0.027)	(0.027)
Age		-0.000	-0.000	-0.000
		(0.000)	(0.000)	(0.000)
Household size		-0.004	0.003	0.003
		(0.007)	(0.009)	(0.009)
Income per hour (€)		0.021***	0.022***	0.022***
		(0.004)	(0.004)	(0.004)
Level of education:				
- Pre-primary education		-0.365**	-0.471***	-0.470***
		(0.146)	(0.169)	(0.169)
- Primary education (ISCED 1)		-0.342***	-0.284***	-0.284***
		(0.058)	(0.069)	(0.069)
- Lower Secondary eduction (ISCED 2)		-0.143***	-0.136***	-0.136***
		(0.035)	(0.039)	(0.039)
- Post-secundary education (ISCED 4)		0.110*	0.123*	0.123*
		(0.057)	(0.063)	(0.063)
- Tertiary education - first level (ISCED 5)		0.373***	0.379***	0.379***
		(0.030)	(0.033)	(0.033)
- Tertiary education - advanced level (ISCED 6)		0.362***	0.399***	0.399***
		(0.124)	(0.140)	(0.140)
Years in company			0.001	0.001
			(0.001)	(0.001)
Work hours per week			-0.008***	-0.008***
			(0.001)	(0.001)
Kind of contract:				
- A fixed term contract			-0.150***	-0.150***
			(0.043)	(0.043)
- A temporary employment agency contract			-0.254**	-0.254**
			(0.109)	(0.109)
- An apprenticeship or other training scheme			0.540***	0.540***
			(0.144)	(0.144)
- No contract			-0.317***	-0.317***
			(0.059)	(0.059)
- Other			0.161	0.161

		(0.148)	(0.148)
Total amount of workers at workplace:			
- Work with 2 to 4		-0.132	-0.132
		(0.082)	(0.082)
- Work with 5 to 9		-0.245***	-0.245***
		(0.080)	(0.080)
- Work with 10 to 49		-0.341***	-0.342***
		(0.077)	(0.078)
- Work with 50 to 99		-0.420***	-0.420***
		(0.084)	(0.084)
- Work with 100 to 249		-0.394***	-0.394***
		(0.086)	(0.086)
- Work with 250 to 499		-0.459***	-0.459***
		(0.096)	(0.096)
- Work with 500 and over		-0.503***	-0.503***
		(0.091)	(0.091)
Country:			
- Bulgaria	-0.592***	-0.449***	-0.443***
	(0.100)	(0.111)	(0.116)
- Czech Republic	-0.573***	-0.528***	-0.522***
	(0.084)	(0.093)	(0.100)
- Denmark	0.766***	0.851***	0.852***
	(0.081)	(0.087)	(0.087)
- Germany	0.019	0.040	0.040
	(0.066)	(0.073)	(0.073)
- Estonia	-0.641***	-0.555***	-0.549***
	(0.095)	(0.103)	(0.109)
- Greece	-1.022***	-0.826***	-0.821***
	(0.115)	(0.136)	(0.140)
- Spain	-0.407***	-0.358***	-0.352***
	(0.102)	(0.111)	(0.116)
- France	-0.624***	-0.644***	-0.644***
	(0.063)	(0.069)	(0.070)
- Ireland	0.212**	0.315***	0.321***
	(0.086)	(0.097)	(0.104)
- Italy	-0.665***	-0.633***	-0.628***
	(0.090)	(0.103)	(0.108)
- Cyprus	0.541***	0.834***	0.839***
	(0.116)	(0.128)	(0.132)
- Latvia	-0.849***	-0.746***	-0.740***
	(0.085)	(0.092)	(0.099)
- Lithuania	-1.097***	-1.084***	-1.079***
	(0.089)	(0.096)	(0.103)
- Luxembourg	-0.437***	-0.406***	-0.405***
	(0.124)	(0.137)	(0.137)
- Hungary	-0.938***	-0.800***	-0.794***
	(0.088)	(0.096)	(0.102)
- Malta	0.203*	0.388***	0.393***
	(0.110)	(0.121)	(0.125)
- Netherlands	0.006	0.014	0.013
	(0.076)	(0.084)	(0.084)
- Austria	0.241***	0.306***	0.307***
	(0.085)	(0.092)	(0.092)
- Poland	-0.376***	-0.177**	-0.172*
	(0.081)	(0.089)	(0.096)

- Portugal		-0.174*	-0.140	-0.135
		(0.089)	(0.100)	(0.105)
- Romania		-0.564***	-0.248**	-0.242**
		(0.092)	(0.102)	(0.108)
- Slovenia		-0.979***	-0.921***	-0.915***
		(0.077)	(0.085)	(0.092)
- Slovakia		-0.579***	-0.493***	-0.487***
		(0.088)	(0.099)	(0.105)
- Finland		-0.294***	-0.239***	-0.239***
		(0.073)	(0.079)	(0.080)
- Sweden		-0.117	-0.027	-0.027
		(0.084)	(0.092)	(0.092)
- United Kingdom		0.547***	0.628***	0.633***
		(0.083)	(0.091)	(0.099)
- Croatia		-0.315***	-0.297***	-0.291***
		(0.099)	(0.107)	(0.112)
- FYROM		-1.146***	-0.974***	-0.968***
		(0.103)	(0.116)	(0.121)
- Turkey		-1.061***	-0.828***	-0.822***
		(0.075)	(0.093)	(0.100)
- Norway		0.275***	0.392***	0.398***
		(0.083)	(0.089)	(0.095)
- Albania		-1.382***	-0.851***	-0.845***
		(0.101)	(0.125)	(0.130)
- Kosovo		-1.063***	-0.738***	-0.733***
		(0.096)	(0.119)	(0.123)
- Montenegro		-0.837***	-0.678***	-0.674***
		(0.110)	(0.123)	(0.127)
cut1				
_cons	-3.286***	-3.661***	-4.359***	-4.356***
	(0.027)	(0.082)	(0.138)	(0.139)
cut2				
_cons	-1.473***	-1.768***	-2.370***	-2.366***
	(0.017)	(0.077)	(0.133)	(0.134)
cut3				
_cons	1.134***	1.089***	0.584***	0.587***
	(0.016)	(0.077)	(0.132)	(0.133)
N	42318	28457	23649	23649
p	0.000	0.000	0.000	0.000

Standard errors in parentheses
* $p < .1$, ** $p < .05$, *** $p < .01$

Table 9: Ordered multinomial LOGIT regression on satisfaction of the atmosphere among colleagues

	(1) Satisfaction of the atmosphere among colleagues	(2) Satisfaction of the atmosphere among colleagues	(3) Satisfaction of the atmosphere among colleagues	(4) Satisfaction of the atmosphere among colleagues
Commuting time (hour)	-0.160***	-0.165***	-0.143***	-0.133***
	(0.016)	(0.020)	(0.021)	(0.027)
Tax deduction x commuting time				-0.025
				(0.044)
Female		-0.018	-0.012	-0.013
		(0.023)	(0.025)	(0.025)
Age (years)		-0.000	-0.000	-0.000
		(0.000)	(0.000)	(0.000)
Household size		0.018**	0.018**	0.018**
		(0.007)	(0.008)	(0.008)
Income per hour (€)		0.007***	0.006*	0.006*
		(0.003)	(0.003)	(0.003)
Level of education:				
- Pre-primary education		-0.285**	-0.215	-0.216
		(0.144)	(0.150)	(0.150)
- Primary education (ISCED 1)		-0.069	-0.044	-0.044
		(0.060)	(0.064)	(0.064)
- Lower Secondary eduction (ISCED 2)		-0.055	-0.075**	-0.075**
		(0.035)	(0.037)	(0.037)
- Post-secundary education (ISCED 4)		0.203***	0.144**	0.144**
		(0.054)	(0.056)	(0.056)
- Tertiary education - first level (ISCED 5)		0.104***	0.109***	0.109***
		(0.027)	(0.029)	(0.029)
- Tertiary education - advanced level (ISCED 6)		0.163	0.130	0.131
		(0.112)	(0.119)	(0.119)
Years in company			0.010***	0.010***
			(0.001)	(0.001)
Work hours per week			-0.002*	-0.002*
			(0.001)	(0.001)
Kind of contract:				
- A fixed term contract			-0.243***	-0.243***
			(0.039)	(0.039)
- A temporary employment agency contract			-0.300***	-0.301***
			(0.110)	(0.110)
- An apprenticeship or other training scheme			0.444***	0.444***
			(0.120)	(0.120)
- No contract			-0.224***	-0.224***
			(0.056)	(0.056)
- Other			0.323**	0.324**
			(0.129)	(0.129)
Total amount of worker at workplace:				
- Work with 2 to 4			1.093***	1.094***

		(0.116)	(0.116)
- Work with 5 to 9		1.139***	1.140***
		(0.114)	(0.114)
- Work with 10 to 49		0.989***	0.989***
		(0.112)	(0.112)
- Work with 50 to 99		0.915***	0.916***
		(0.115)	(0.115)
- Work with 100 to 249		0.842***	0.842***
		(0.116)	(0.116)
- Work with 250 to 499		0.851***	0.851***
		(0.123)	(0.123)
- Work with 500 and over		0.836***	0.836***
		(0.118)	(0.118)
Country:			
- Bulgaria	-0.104	-0.022	-0.041
	(0.094)	(0.100)	(0.105)
- Czech Republic	-0.766***	-0.866***	-0.885***
	(0.080)	(0.086)	(0.092)
- Denmark	0.529***	0.580***	0.580***
	(0.072)	(0.077)	(0.077)
- Germany	-0.434***	-0.507***	-0.507***
	(0.067)	(0.072)	(0.072)
- Estonia	-0.262***	-0.270**	-0.290***
	(0.101)	(0.106)	(0.111)
- Greece	-0.329***	-0.321***	-0.340***
	(0.104)	(0.114)	(0.119)
- Spain	-0.270***	-0.258***	-0.277***
	(0.087)	(0.093)	(0.099)
- France	-0.475***	-0.486***	-0.487***
	(0.061)	(0.065)	(0.065)
- Ireland	0.438***	0.539***	0.520***
	(0.081)	(0.087)	(0.093)
- Italy	-1.109***	-1.198***	-1.215***
	(0.080)	(0.088)	(0.092)
- Cyprus	0.213**	0.153	0.136
	(0.103)	(0.111)	(0.115)
- Latvia	-0.205**	-0.218**	-0.238**
	(0.087)	(0.093)	(0.099)
- Lithuania	-1.155***	-1.218***	-1.236***
	(0.086)	(0.090)	(0.095)
- Luxembourg	-0.245*	-0.205	-0.206
	(0.135)	(0.144)	(0.144)
- Hungary	-0.012	0.049	0.029
	(0.090)	(0.094)	(0.100)
- Malta	0.763***	0.831***	0.814***
	(0.088)	(0.095)	(0.100)
- Netherlands	-0.510***	-0.424***	-0.423***
	(0.074)	(0.080)	(0.080)
- Austria	-0.428***	-0.454***	-0.456***
	(0.084)	(0.087)	(0.087)
- Poland	-0.708***	-0.682***	-0.701***
	(0.078)	(0.084)	(0.090)
- Portugal	0.196**	0.072	0.055
	(0.094)	(0.098)	(0.102)
- Romania	-0.184**	-0.145	-0.165*
	(0.087)	(0.092)	(0.098)

- Slovenia		-0.338***	-0.420***	-0.438***
		(0.073)	(0.079)	(0.086)
- Slovakia		-0.779***	-0.834***	-0.853***
		(0.082)	(0.090)	(0.095)
- Finland		0.251***	0.297***	0.297***
		(0.070)	(0.074)	(0.074)
- Sweden		0.391***	0.366***	0.366***
		(0.076)	(0.081)	(0.081)
- United Kingdom		0.521***	0.602***	0.582***
		(0.079)	(0.083)	(0.090)
- Croatia		-0.035	-0.099	-0.117
		(0.083)	(0.089)	(0.094)
- FYROM		-0.402***	-0.422***	-0.441***
		(0.096)	(0.105)	(0.110)
- Turkey		-1.192***	-1.231***	-1.251***
		(0.072)	(0.084)	(0.090)
- Norway		0.488***	0.533***	0.515***
		(0.072)	(0.077)	(0.083)
- Albania		-0.239**	-0.209*	-0.227*
		(0.101)	(0.114)	(0.118)
- Kosovo		0.682***	1.085***	1.068***
		(0.094)	(0.113)	(0.117)
- Montenegro		-0.240**	-0.216**	-0.232**
		(0.098)	(0.106)	(0.110)
cut1				
_cons	-6.241***	-6.522***	-5.799***	-5.810***
	(0.113)	(0.155)	(0.216)	(0.217)
cut2				
_cons	-5.455***	-5.699***	-4.899***	-4.910***
	(0.077)	(0.115)	(0.177)	(0.179)
cut3				
_cons	-4.558***	-4.760***	-3.968***	-3.979***
	(0.050)	(0.090)	(0.160)	(0.162)
cut4				
_cons	-3.790***	-3.982***	-3.148***	-3.159***
	(0.036)	(0.080)	(0.154)	(0.155)
cut5				
_cons	-3.006***	-3.209***	-2.375***	-2.386***
	(0.027)	(0.075)	(0.151)	(0.152)
cut6				
_cons	-2.411***	-2.603***	-1.749***	-1.760***
	(0.022)	(0.073)	(0.149)	(0.151)
cut7				
_cons	-1.766***	-1.934***	-1.052***	-1.063***
	(0.019)	(0.071)	(0.149)	(0.150)
cut8				
_cons	-1.146***	-1.282***	-0.371**	-0.383**
	(0.017)	(0.071)	(0.148)	(0.150)
cut9				
_cons	-0.460***	-0.550***	0.387***	0.376**
	(0.016)	(0.070)	(0.148)	(0.150)
cut10				
_cons	0.340***	0.306***	1.271***	1.260***
	(0.016)	(0.070)	(0.148)	(0.150)
cut11				
_cons	1.272***	1.296***	2.290***	2.279***

	(0.017)	(0.071)	(0.149)	(0.150)
cut12				
_cons	2.103***	2.173***	3.197***	3.186***
	(0.021)	(0.072)	(0.150)	(0.151)
N	36319	25106	22544	22544
p	0.000	0.000	0.000	0.000

Standard errors in parentheses
* $p < .1$, ** $p < .05$, *** $p < .01$

Table 10: Ordered multinomial LOGIT regression on satisfaction of the relationship between worker and supervisor

	(1) Satisfaction of the relationship between worker and supervisor	(2) Satisfaction of the relationship between worker and supervisor	(3) Satisfaction of the relationship between worker and supervisor	(4) Satisfaction of the relationship between worker and supervisor
Commuting time (hour)	-0.132***	-0.144***	-0.124***	-0.087***
	(0.018)	(0.022)	(0.023)	(0.030)
Tax deduction x commuting time				-0.091**
				(0.045)
Female		0.065***	0.052**	0.051**
		(0.024)	(0.025)	(0.025)
Age (years)		-0.001**	-0.000*	-0.000*
		(0.000)	(0.000)	(0.000)
Household size		0.006	0.008	0.008
		(0.008)	(0.009)	(0.009)
Income per hour (€)		0.009***	0.009***	0.009***
		(0.002)	(0.002)	(0.002)
Level of education:				
- Pre-primary education		-0.211	-0.312**	-0.318**
		(0.139)	(0.140)	(0.139)
- Primary education (ISCED 1)		-0.245***	-0.225***	-0.224***
		(0.061)	(0.061)	(0.061)
- Lower Secondary eduction (ISCED 2)		-0.192***	-0.192***	-0.192***
		(0.035)	(0.036)	(0.036)
- Post-secundary education (ISCED 4)		0.108**	0.092*	0.092*
		(0.054)	(0.055)	(0.055)
- Tertiary education - first level (ISCED 5)		0.203***	0.220***	0.222***
		(0.028)	(0.029)	(0.029)
- Tertiary education - advanced level (ISCED 6)		0.332***	0.404***	0.407***
		(0.115)	(0.115)	(0.115)
Years in company			0.002*	0.002*
			(0.001)	(0.001)
Work hours per week			-0.003**	-0.003**
			(0.001)	(0.001)
Kind of contract:				
- A fixed term contract			-0.080**	-0.079**

		(0.038)	(0.038)
- A temporary employment agency contract		-0.286***	-0.288***
		(0.099)	(0.099)
- An apprenticeship or other training scheme		0.469***	0.469***
		(0.124)	(0.124)
- No contract		-0.236***	-0.236***
		(0.054)	(0.054)
- Other		0.111	0.113
		(0.126)	(0.126)
Total amount of workers at workplace:			
- Work with 2 to 4		0.480***	0.482***
		(0.081)	(0.081)
- Work with 5 to 9		0.410***	0.410***
		(0.080)	(0.080)
- Work with 10 to 49		0.220***	0.220***
		(0.077)	(0.077)
- Work with 50 to 99		0.081	0.082
		(0.082)	(0.082)
- Work with 100 to 249		0.063	0.064
		(0.083)	(0.083)
- Work with 250 to 499		0.016	0.016
		(0.093)	(0.093)
- Work with 500 and over		0.020	0.020
		(0.088)	(0.088)
Country:			
- Bulgaria	0.423***	0.443***	0.376***
	(0.099)	(0.104)	(0.109)
- Czech Republic	-0.248***	-0.258***	-0.326***
	(0.079)	(0.081)	(0.088)
- Denmark	0.583***	0.604***	0.604***
	(0.074)	(0.075)	(0.075)
- Germany	-0.433***	-0.471***	-0.473***
	(0.068)	(0.069)	(0.069)
- Estonia	-0.006	-0.018	-0.088
	(0.106)	(0.108)	(0.113)
- Greece	0.270***	0.288***	0.225**
	(0.104)	(0.107)	(0.112)
- Spain	0.336***	0.305***	0.238**
	(0.096)	(0.100)	(0.105)
- France	-0.332***	-0.340***	-0.342***
	(0.063)	(0.065)	(0.065)
- Ireland	0.771***	0.838***	0.768***
	(0.089)	(0.092)	(0.098)
- Italy	-0.755***	-0.772***	-0.833***
	(0.083)	(0.085)	(0.090)
- Cyprus	1.056***	1.089***	1.028***
	(0.110)	(0.113)	(0.117)
- Latvia	-0.006	-0.007	-0.078
	(0.089)	(0.091)	(0.098)
- Lithuania	-0.539***	-0.582***	-0.647***
	(0.085)	(0.088)	(0.093)
- Luxembourg	-0.322**	-0.308**	-0.313**
	(0.133)	(0.137)	(0.137)
- Hungary	0.243**	0.305***	0.234**
	(0.095)	(0.096)	(0.102)

- Malta		1.227***	1.317***	1.255***
		(0.097)	(0.100)	(0.105)
- Netherlands		0.066	0.077	0.079
		(0.078)	(0.080)	(0.080)
- Austria		-0.177**	-0.164*	-0.172*
		(0.087)	(0.089)	(0.089)
- Poland		-0.417***	-0.403***	-0.471***
		(0.078)	(0.081)	(0.088)
- Portugal		0.632***	0.619***	0.561***
		(0.089)	(0.091)	(0.095)
- Romania		0.129	0.178*	0.106
		(0.090)	(0.093)	(0.099)
- Slovenia		0.060	0.082	0.016
		(0.075)	(0.077)	(0.084)
- Slovakia		-0.417***	-0.433***	-0.498***
		(0.085)	(0.087)	(0.093)
- Finland		0.402***	0.386***	0.382***
		(0.073)	(0.075)	(0.075)
- Sweden		0.075	0.102	0.102
		(0.082)	(0.085)	(0.085)
- United Kingdom		0.580***	0.656***	0.586***
		(0.084)	(0.085)	(0.091)
- Croatia		0.078	0.046	-0.018
		(0.084)	(0.086)	(0.091)
- FYROM		0.088	0.061	-0.005
		(0.102)	(0.106)	(0.111)
- Turkey		-0.537***	-0.455***	-0.525***
		(0.075)	(0.084)	(0.090)
- Norway		0.515***	0.548***	0.485***
		(0.075)	(0.077)	(0.083)
- Albania		-0.051	-0.010	-0.075
		(0.104)	(0.109)	(0.113)
- Kosovo		0.973***	1.002***	0.943***
		(0.099)	(0.104)	(0.108)
- Montenegro		-0.028	-0.042	-0.101
		(0.101)	(0.104)	(0.109)
cut1				
_cons	-4.582***	-4.357***	-4.286***	-4.325***
	(0.054)	(0.093)	(0.136)	(0.137)
cut2				
_cons	-3.374***	-3.163***	-3.085***	-3.123***
	(0.032)	(0.079)	(0.127)	(0.128)
cut3				
_cons	-2.471***	-2.275***	-2.180***	-2.219***
	(0.024)	(0.075)	(0.125)	(0.126)
cut4				
_cons	-1.667***	-1.462***	-1.357***	-1.395***
	(0.019)	(0.073)	(0.124)	(0.125)
cut5				
_cons	-0.880***	-0.649***	-0.536***	-0.575***
	(0.017)	(0.073)	(0.123)	(0.125)
cut6				
_cons	-0.114***	0.156**	0.275**	0.236*
	(0.017)	(0.072)	(0.123)	(0.124)
cut7				
_cons	0.836***	1.162***	1.290***	1.252***

	(0.017)	(0.073)	(0.123)	(0.125)
cut8				
_cons	2.187***	2.572***	2.715***	2.677***
	(0.022)	(0.075)	(0.125)	(0.126)
N	32638	23220	22695	22695
p	0.000	0.000	0.000	0.000

Standard errors in parentheses
* $p < .1$, ** $p < .05$, *** $p < .01$