

# New Evidence on Cross-Country Differences in Job Satisfaction Using Anchoring Vignettes\*

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## Abstract

This paper presents results on cross-country comparison of job satisfaction across seven EU countries taking into account that people in different countries may perceive subjective questions differently. We apply a chopit model approach where the threshold parameters in an ordered probit model are re-scaled through anchoring vignettes. Compared to a traditional ordered probit model, which yields the familiar result that Denmark and Finland are ranked in the very top, the country ranking is altered when the chopit model is applied. In this case, the Scandinavian countries are ranked somewhat lower while workers from the Netherlands are found to have the highest level of job satisfaction. These results suggest that cultural differences in the way people perceive subjective questions about satisfaction make simple cross-country comparison misleading.

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# 1 Introduction

Within the economics profession, a series of studies on subjective well-being, life satisfaction and job satisfaction have proliferated in recent years, (see Frey and Stutzer 2002a, Frey and Stutzer 2002b, van Praag and Ferrer-i-Carbonell 2004 and Clark et al. (2006) for recent, large scale surveys). In some studies, job satisfaction or overall life satisfaction has been regressed, using some kind of ordered logit or probit approach, on a number of variables using cross-country data, and country dummies have then been used to capture country-specific effects.

Interestingly, cross-country studies of happiness with life or satisfaction with work find surprisingly consistent results in the ranking of nations. For instance, Denmark and Ireland are persistently ranked in the very top with respect to well-being (Eurobarometer 2002, Inglehart and Klingemann 2000, Easterlin 2001) and job satisfaction (Clark 2005, Ahn and Garcia 2004, Blanchflower and Oswald 1999, Kaiser 2002).<sup>1</sup>

The validity of these satisfaction studies is important for a number of reasons. First, many private companies periodically evaluate their employees' job satisfaction. This is of great concern to managers who seek to abstain employees from quitting (Clark 2001) and because it is generally believed that satisfied workers are more productive than dissatisfied workers (Pfeffer and Langton 1993, Koys 2001, Patterson et al. 2004).

Second, satisfaction studies often attract a lot of attention from the news media, which in itself may increase the probability that politicians will react upon the results of these studies.

Third, the demographic evolution towards ageing populations in OECD countries puts strain on public finances since, *ceteris paribus*, a lower share of the population will be working and pay taxes to finance government spending while, possibly, the pressure on public health care and pension systems may increase. For this reason there is a clear objective formulated in the so-called Barcelona and Stockholm targets of the European Union to increase the age in which people exit the labor market. In recent years, the European Commission has consequently devoted a lot of attention to the quality of jobs (EU 2001, 2002, 2003), and indicators of quality have been chosen based on their ability to predict self-reported job satisfaction (EU 2002, p. 81).

Hence, satisfaction studies, including cross-country studies, are highly important for development of public policies as well as for human resource

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<sup>1</sup>World Value Survey also finds this. See <http://www.worldvaluessurvey.org/statistics/index.html>.

management. For instance, if it truly is the case that job satisfaction is higher in Denmark and Ireland than in other countries then one could argue that working life should be arranged in a way that resembles the labour market in these countries.

However, the problem with studies that have been done up to this date is that it is unclear whether the results are due to the fact that it actually is nicer to work in Ireland or Denmark or whether the Irish and the Danes perceive questions of job satisfaction in different ways compared to people in other countries. More generally, one of the inherent problems with using subjective answers to questions on individual well-being is that individuals, at least from different cultures, may perceive these questions in different ways, and that there may therefore be systematic differences across groups of sub-populations. As answers to questions on individual well-being most often are reported on a discrete scale, this means, in a technical sense, that the response category cut points for the different evaluations of self-assessed happiness or job satisfaction will differ between groups.

Layard (2003) and Veenhoven (2000) both discuss the possibility of cultural differences in reporting satisfaction and happiness but note that, to date, “*There is no evidence of this...*” (Layard 2003, p. 19), i.e. of cultural differences in reporting happiness, and hence conclude that “*For the present it appears that self-reports of overall happiness can be meaningfully compared across nations*” (Veenhoven 2000, p. 271).

In this paper, we seek to provide evidence of whether or not there are any cultural differences in reports of satisfaction. Our approach to remedy this potential problem takes as its starting point the correction of response category cut points by the means of anchoring vignettes. This methodology has earlier been applied in other social sciences, e.g. in political science (King et al. 2004) and in medicine (Salomon et al. 2004).

The idea behind this method is that respondents, in addition to stating how satisfied they are with their own life or job, are asked to evaluate, on the same scale, how good or bad a set of hypothetical jobs or life situations are. This information is then used to rescale individuals’ real evaluation of their own situation, using a joint, so-called chopit model (compound hierarchical ordinal probit, see Rabe-Hesketh and Skrondal 2002) for the job satisfaction question and the vignettes. Thus, if one particular group, say the Danes, systematically gives higher valuations of hypothetical jobs compared to other nationalities that rank the exact same hypothetical jobs, this would indicate that differences in job satisfaction are due to cultural differences in evaluating such subjective questions and not due to better organization of workplaces or better work environment in Denmark.

Hence, in this paper we re-examine cross-country differences in job satisfaction using anchoring vignettes. We contribute to the satisfaction literature by examining to which extent cross-country differences in job satisfaction adhere to cultural differences in responding to subjective questions. This is done using data from a purpose-built questionnaire, applied to seven EU countries, and asking respondents to rank their own job as well as hypothetical jobs. The analysis extends the standard ordered probit model along two dimensions. First, and most importantly, by using vignettes we are able to re-scale respondents' answers in order to make them comparable across countries. Second, the thresholds are allowed to depend on covariates.

Our main finding is that, while the standard ordered probit model applied to our data yields the traditional result that Scandinavian countries are ranked in the top, this ranking is altered when anchoring is applied. In this case the Scandinavian countries are ranked somewhat lower while workers from the Netherlands are found to have the highest level of job satisfaction. These results provide the first evidence of cultural differences in reporting of satisfaction and indicate that simple cross-country comparison may be misleading.

## 2 Methodology

The standard way of analyzing answers to questions about job satisfaction is to apply an ordered probit or logit model. However, this approach does not take into account any individual differences in interpretation of the question about job satisfaction. The method we apply in this paper is based on King et al. (2004), where two important extensions to the ordered probit model are introduced.<sup>2</sup>

First, since self-assessment of job satisfaction potentially is incomparable across countries (or sub-populations), we seek to measure how responses differ across countries and use this measure to correct the self-assessment answers in order to make these comparable. The incomparability is measured by respondents' assessments of hypothetical jobs, which are described in vignettes and assessed on the same scale as the respondents' own current job.

Second, the method allows the threshold parameters in the ordered probit model to differ across respondents and estimate these heterogeneous thresholds using covariates, cf. Groot and van den Brink (1999).

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<sup>2</sup>See also Tandon et al. (2003) and <http://gking.harvard.edu/vign/>.

## 2.1 Vignettes

Vignettes have been used in conjoint analyses in market research and other fields for many years, e.g. Green and Srinivasan (1978). In economics, vignettes have not been widely used although examples do exist, e.g. van Beek et al. (1997). In the present context, a vignette describes the content of a hypothetical job, for example one vignette looks as follows.

Type of contract	Permanent with a risk of losing the job and then receive unemployment benefits	<a href="#">More</a>
Number of work hours	50 hours per week	<a href="#">More</a>
Influence on own work	Nobody but you decide over your work	<a href="#">More</a>
Organisation of the work	The job entails work in different teams	<a href="#">More</a>
Start/end time	The employer decides on work hours (not night shifts) and can change this on a monthly basis	<a href="#">More</a>
Education and training	The employer will not offer you a specific education	
Intensity	The job is very demanding, which means that you need to stick to tight deadlines most of the time	
Pension age	This firm has no early retirement plan	<a href="#">More</a>
Akerlof theory	Same working conditions as in other companies Loyalty from both sides No possibilities for shirking	<a href="#">More</a>
Net wage	10% less per hour than your current job	
Hold the mouse over "More" to gain additional information		

Figure 1 Example of Vignette

Each respondent is presented with five different hypothetical jobs, i.e. five vignettes. For each vignette, the respondent is asked to rate this fictive job on a scale from 0 (worst possible) to 10 (best possible), like respondents also evaluate their own current job on the same scale, cf. section 3.

The left column of Figure 1 lists the variables considered for the fictive jobs. These are the same for all vignettes. The center column describes the values of the variables in this particular vignette. Contrary to the respondents' own jobs, these hypothetical jobs are the same across all individuals. Hence, the rating from the vignettes can be used to re-scale the ratings of individuals' self-assessment of their current jobs.<sup>3</sup>

<sup>3</sup>Data were collected through the internet, as described in section 3. The right column was introduced in order to give respondents an opportunity to gain a more extensive

There are two critical assumptions that need to hold in order for this method to be valid.

**Assumption 1** *Response Equivalence: Individuals use the response categories for the job satisfaction questions in the same way when they evaluate hypothetical scenarios as they do when they provide self-reported assessments of their own current jobs.*

**Assumption 2** *Vignette Equivalence: The domain levels represented in each vignette are understood in the same way by all respondents, irrespective of their country of residence or other sociodemographic variables.*

These assumptions are not necessarily innocent. The literature on happiness and job satisfaction has long established that utility is relative and based on comparison with different reference groups as well as based on expectations, e.g. Clark (2003). Response equivalence means that if respondents base their assessment of their own current job on comparisons with certain reference groups then they should have the same reference groups in mind when they evaluate the hypothetical jobs. More importantly, vignette equivalence implies that, for each vignette, there is an *actual* (unobserved) level of job satisfaction which everybody agrees to. In other words, all respondents value the specific job contents in the same manner. Differences in institutional settings across countries may be one reason why this assumption might not hold. For instance, "Type of contract" may matter less in the Nordic countries where welfare benefits are very generous while a permanent contract is considered more important, vis-à-vis other job characteristics, in countries with less generous welfare benefits. The assumption about vignette equivalence limits the scope and applicability of the method to countries and cultures that are relatively homogenous.

However, this difficulty should not be overemphasized. The countries included in this study are not too dissimilar – they all belong to the EU, and they have very similar per capita GDP levels, at least in an international perspective. Furthermore, in earlier research using similar methodology, countries as far apart as China and Mexico have been included successfully in the same study.

Nevertheless, institutions do differ between countries, and for instance within the EU, one can envisage that the concept of a permanent contract may be understood very differently in France compared to Denmark. For

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explanation of the description in the center column.

instance, it is much more difficult for an employer to fire an employee with a permanent contract in France than in Denmark. In the empirical part of the paper, we will return to this issue, as we perform various sensitivity analyses.

## 2.2 Model for Self-Assessment of Job Satisfaction

The latent (unobserved) perceived level of job satisfaction of individual  $i$ ,  $JS_i^*$ , is modelled as an ordered probit model

$$JS_i^* = X_i' \beta + \varepsilon_i$$

where  $X_i$  includes covariates,  $\beta$  includes parameters and  $\varepsilon_i$  is an individual residual error term, assumed to be standard normal distributed,  $\varepsilon_i \sim N(0, 1)$ .

Respondent  $i$  turns the continuous perceived level of satisfaction with his/her job into the reported category,  $js_i$ , where

$$js_i = k \text{ if } \tau_i^{k-1} \leq JS_i^* < \tau_i^k$$

and where  $-\infty = \tau_i^0 < \tau_i^1 < \dots < \tau_i^K = \infty$ , and  $K = 10$ .

The thresholds are allowed to vary over the observations as a function of covariates  $Z_i$ , which may overlap with  $X_i$ .

$$\begin{aligned} \tau_i^1 &= \gamma^1 Z_i \\ \tau_i^k &= \gamma^{k-1} + e^{\gamma^{k-1} Z_i} \quad , \quad k = 2, \dots, 10. \end{aligned}$$

where  $\gamma^k$  are parameters.

## 2.3 Model for Vignettes

The assumption of vignette equivalence means that there is a "true" (objective) actual level of job satisfaction underlying each hypothetical job. For vignette  $j$ , we denote this "true" (unobserved) actual level as  $\theta_j$  ( $j = 1, \dots, 95$ ), which is not subscripted by respondent - a direct formalization of vignette equivalence. As not all  $N$  respondents have been subjected to the same five vignettes, cf. section 3, we denote respondents to vignettes by index  $l$ .

Respondent  $l$  perceives  $\theta_j$  with (normal random) error, so that

$$V_{l,j}^* \sim N(\theta_j, \sigma^2)$$

becomes respondent  $l$ 's continuous, unobserved perception of the actual level of job satisfaction for vignette  $j$ .

Respondent  $l$  turns the perception of job satisfaction related to the hypothetical job into reported categories in a similar manner as for the self-assessment. The rule here is

$$v_{l,j} = k \text{ if } \tau_l^{k-1} \leq V_{l,j}^* < \tau_l^k.$$

The thresholds are determined by the same  $\gamma$  coefficients as in the model for self-assessment of job satisfaction and the same explanatory variables, measured for respondent  $l$ ,  $Z_l$ .

$$\begin{aligned} \tau_l^1 &= \gamma^{1_1} Z_l \\ \tau_l^k &= \gamma^{k-1} + e^{\gamma^{k_1} Z_l} \quad , \quad k = 2, \dots, 10. \end{aligned}$$

By applying the same thresholds in the vignette model as in the self-assessment model, we enforce response equivalence. Since the variance in the self-assessment model is normalized to one, we are able to identify the variance of the latent variable in the vignette model, i.e. there is no need to set the variance equal to 1 as in the self-assessment model.

The likelihood function for the entire model consists of a self-assessment part and a vignette part, which are additive. Hence, the joint likelihood expression becomes

$$L(\beta, \theta, \gamma \mid js, v) = L_s(\beta, \gamma \mid js) \times L_v(\theta, \gamma \mid v)$$

where  $L_s(\beta, \gamma \mid js)$  is the likelihood component for the self-assessment part and  $L_v(\theta, \gamma \mid v)$  is the likelihood component for the vignette part, see Appendix A for more details. The model outlined in this section is called a chopit model (compound hierarchical ordinal probit, see Rabe-Hesketh and Skrondal 2002, King et al. 2004).

### 3 Data

The data applied in the estimations were collected in the autumn of 2004 in 7 EU countries, in which an identical questionnaire was administered through the internet for a total of 5,988 respondents.<sup>4</sup> The respondents, all

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<sup>4</sup>The countries are Denmark, France, Greece, the Netherlands, Spain, UK and Finland. In Greece, data were collected through personal interviews. The data were collected as part of an EU project. See <http://www.abdn.ac.uk/epicurus/>.



aged between 18 and 65 years, were employees only, with a relatively low education (upper secondary education or lower).

The question on overall job satisfaction reads:

All in all, how satisfied or dissatisfied are you with your current occupation on a scale from 0 to 10? (0=Very dissatisfied and 10=Very satisfied).

As already mentioned, respondents were presented to vignettes with descriptions of hypothetical jobs (see Figure 1) and requested to rank these imaginary jobs on the same scale as they evaluated their own job, i.e. on a 0-10 scale.

Each respondent answered to one set of five vignettes. However, 19 different sets (each with five different vignettes) were used. Hence, there are about 315 respondents for each set of vignettes and 95 different vignettes in total. In Appendix B, we list all attribute levels used in the vignettes.

In addition, the purpose-built data set also contains standard demographic information as well as detailed information about job characteristics and work environment, see Appendix C for a list of variables and their definitions.

## 4 Results

As noted in the introduction, simple cross-country comparison of job satisfaction almost always identify Danes as the most satisfied workers. The data applied in this study are no exception, cf. Figure 2.

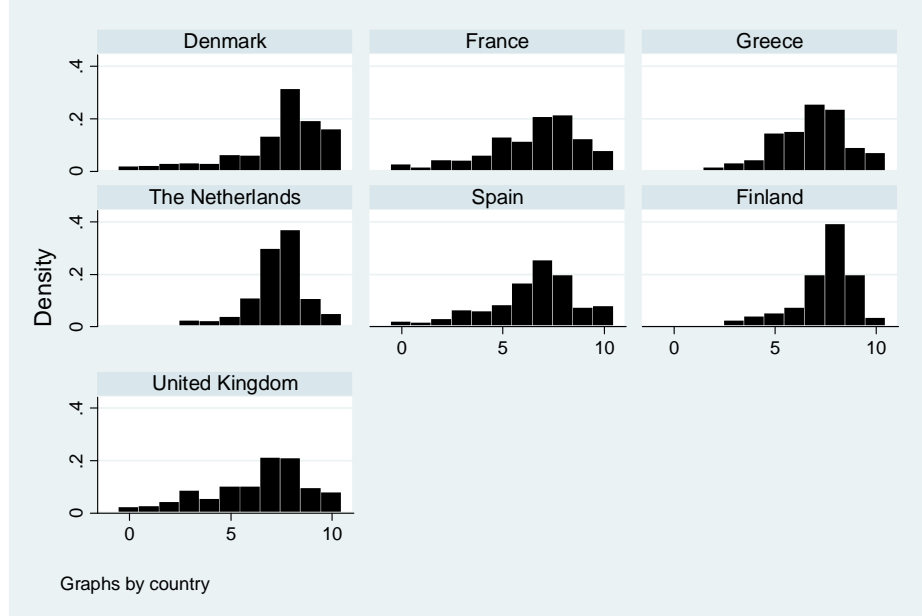


Figure 2 Histograms of self-assessed job satisfaction, by country.

More than 60 percent of Danish workers indicate a level of satisfaction at level 8 or higher, while the corresponding number is less than 38 percent in the UK. The average value is also highest in Denmark (7.5), followed by Finland (7.4) and the Netherlands (7.3). Lowest average values are found in the UK (6.4), Spain (6.5) and France (6.6). Greece is found in the mid range with an average value of 6.9.

The average job satisfaction score for vignettes is considerable lower than for respondent's own job satisfaction, cf. Table 1.

#### TABLE 1 ABOUT HERE

There is also quite a high degree of agreement between countries regarding which vignette set is the best, cf. Table 2. For instance, the vignette set consisting of vignettes 36-40 is ranked to be the best in 4 of 7 countries, whereas the vignette set consisting of vignettes 76-80 is considered to be the worst set in 4 of 7 countries.

#### TABLE 2 ABOUT HERE

There is also a clear pattern in how positive respondents from different countries regard the vignettes. Finns are the most optimistic, as they most often report the highest average score for a certain vignette, cf. Table 3.

TABLE 3 ABOUT HERE

The French on the other hand, report the lowest score on average on average in 7 out of 19 cases. Regression analyses reveals that individual characteristics to some extent can explain the variation in vignette response scores, holding vignette and country constant (results available upon request). In our analysis below, these characteristics are held constant both in the model for self-assessment and in the model for vignette evaluation.

The overall impression from Tables 1 – 3 is that the vignettes seem to work very well and the fact that vignettes are ranked so alike across countries indicates that the assumption of vignette equivalence might hold. We return to this issue in the sensitivity analysis.

#### 4.1 Regression Results

In order to facilitate comparisons with earlier research done on this topic, we present results from a standard ordered probit regression as well as results from the chopit model. The chopit model presented in section 2 has been estimated using GLLAMM.<sup>5</sup> Parameter estimates of country dummies are of primary interest.

Comparing the ordered probit model with the chopit model, however, does not directly reveal the true impact of vignettes since the threshold equation in the ordered probit model is estimated without inclusion of covariates. The key advantage of the vignettes is that they provide us with identification of the model when we include covariates in the threshold equation. Without the vignettes, identification would rest solely on the nonlinear functional form of the model and identification would therefore be weak. Hence, we cannot really identify the ordered probit model with explanatory variables in the threshold equations and therefore we don't estimate this otherwise relevant intermediate model. Instead, as an alternative intermediate model, we estimate the chopit model but with an empty  $Z$  matrix, i.e. without explanatory variables in the threshold equation. This intermediate model also provides us with a robustness check of the applicability of the vignettes since, without modelling the threshold equation, we should expect

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<sup>5</sup>The software is made available for free and can be downloaded from [www.gllamm.org](http://www.gllamm.org). Also see Skrondal and Rabe-Hesketh (2004).

to find no changes in the country rankings as a result of estimating on a mix of vignette evaluations and evaluations of respondents own jobs.

Estimation results from the standard ordered probit model confirm results from previous studies (Clark 2005, Ahn and Garcia 2004, Blanchflower and Oswald 1999, Kaiser 2002) as well as the impression from univariate comparison of histograms. For instance, the country dummy variable for Denmark is positive and statistically highly significant (1% level), cf. Table 4, column (1).

#### TABLE 4 ABOUT HERE

Hence, based on the standard ordered probit model with a 'standard' set of control variables (Table 4, model 1) we would conclude that Danish workers have a higher level of job satisfaction than their Dutch counterparts (the Netherlands is used as reference country). Similarly, the indicator for Finland is statistically significant (5% level) and positive, while the indicator variables for UK and France are negative and statistically significant, indicating a lower level of job satisfaction in these countries vis-à-vis the Netherlands.

However, as the country indicator variables pick up residual variance not captured by the control variables, it is important to include as many job characteristics as possible in order to capture cross-country differences due to unobserved factors as precise as possible. When we include very detailed information, which is available in our data but not usually available in other data sets, we obtain a different country ranking (Table 4, model 2). Once more detailed job characteristics are included the traditional finding that Danes have the highest level of job satisfaction fails to hold. In this case Finland is ranked highest, followed by Denmark. The Netherlands, previously ranked 3, is here ranked 4 while Greece ranks 3. This suggests that the top ranking of Denmark, found in Eurobarometer (2002) and elsewhere, partly is due to omitted variable bias. In the following, we therefore include the full set of explanatory variables in both the ordered probit as well as the chopit model, and estimate the latter with and without covariates in the threshold equation, cf. Table 5.

#### TABLE 5 ABOUT HERE

Generally, the parameter estimates of country indicator variables from the full-fledged chopit model, model (3), differ a lot from the estimates obtained using the standard ordered probit model, model (1). The intermediate model (2), on the other hand, yields parameter estimates of country

indicators that are almost identical to those from the ordered probit model and preserves the country ranking from the ordered probit model.

In the full-fledged model, The Netherlands is now found to be the highest ranking country in terms of job satisfaction. Greece second, while Denmark ranks third and significantly lower than the Netherlands. Finland drops from its position as highest ranked to be ranked in the fourth place, cf. Table 6.

#### TABLE 6 ABOUT HERE

Among the other covariates included in  $X$ , the parameter estimates for age, income, female, firm size, work time, contract type, union membership, number of times injured, speed of work, repetitive tasks, commuting time, promotion probabilities and tenure change relatively little among the three models. Job satisfaction is found to increase with age, income and to be higher for females. This reflects the so-called "gender paradox" (Clark 1997), by which females respond higher to job satisfaction questions irrespective of their usually unfavorable working conditions. A more recent study by Bender et al. (2005) find that the paradox disappears when account is taken of work time flexibility — valued higher by females. However, here we do control for work time flexibility and still find that females report a significantly higher level of job satisfaction than males.

Many studies have found that low educated, perhaps as a result of lower expectations, report a higher level of job satisfaction than individuals with relatively higher education (Clark 1999). We do not find any significant difference between education groups here — presumably because we condition the entire sample on people with relatively low education.

Between the intermediate model and the full-fledged model parameter estimates other than the country dummies change relatively little. This indicates that correcting for cultural differences only plays a minor role for these covariates. One exception is the parameter estimate for weekly hours, which decreases substantially and becomes significant, indicating that there are cultural differences in the impact of working hours on job satisfaction.

In the full-fledged chopit model threshold parameters are allowed to depend on covariates. We have chosen to include country indicators as well as some of the usually important variables (important for job satisfaction) in  $Z$ , including age, gender, income and weekly hours of work, and hence we use these covariates to determine the thresholds. Although the covariates are insignificant for some of the thresholds, they generally appear to have some explanatory power and therefore their inclusion improve the overall fit

of the model.

In the estimation of the first threshold parameter,  $\tau_1$ , the country dummy for, say, Denmark is found to be 0.175 and significant. This means that the Danes have a higher standard for what constitutes this particular level of job satisfaction (i.e. picturing a normal density distribution with 10 thresholds along the horizontal axis, the first threshold for Denmark is pushed to the right compared to the Netherlands). On the other hand, the country dummies for Denmark for thresholds 5 – 9 ( $\tau_5 - \tau_9$ ) are negative and significant, which means that Danes have a lower standard for what constitutes these levels of job satisfaction than Dutch workers have. This explains why the ranking of the Netherlands and Denmark is reversed when the chopit model is estimated instead of the ordered probit model.

The log-likelihood value increases dramatically when we estimate the chopit model, and although the number of degrees of freedom lost is also very large, the chopit model clearly fits the data better than the ordered probit model.<sup>6</sup>

## 4.2 Sensitivity Analysis

Are the results presented in the last section truly indicative of cultural differences in how questions about job satisfaction are perceived? Or could it be, alternatively, that the results spuriously are driven by other factors?

The most critical assumption is that of Vignette Equivalence. Hence, we estimate the chopit model in two alternative manners in order to test the robustness of our results.

Firstly, since the value of attributes used in the vignettes is likely to depend on the institutional set-up in each country, it might well be that the cure is as bad as the disease, i.e. that the chopit model is invalid because the assumption of vignette equivalence doesn't hold. Although the seven countries are relatively homogeneous, "old" members of the EU, they may still be too different for the assumption of vignette equivalence to hold. In order to indirectly test whether this is the case, we split the sample according to the *Inglehart values map*, see Appendix D.<sup>7</sup> Following the Inglehart map, we construct two groups of countries with similar cultures: Finland, Denmark and the Netherlands in one group (Protestant Europe) and Greece, Spain and France in another group (Catholic Europe). As UK, according to Inglehart's map, belongs to a third group, we omit the UK here and estimate

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<sup>6</sup>The number of degrees of freedom is 205 (95  $\theta$ -values and  $10 \times 11 = 110$  extra parameters). The *difference* in likelihood values is 4,449.

<sup>7</sup><http://www.worldvaluessurvey.org/statistics/index.html>.

both the ordered probit model and the chopit model for these two groups separately.

The results (available upon request) do not change the picture described above. The country dummy parameter estimates are left virtually unaffected by separating the sample, and the conclusions remain unaltered.

Secondly, when the institutional set-up differs between countries this may affect the relative valuation of the various job characteristics included in the vignettes. In particular, "Type of contract" may have very different degrees of importance across countries vis-à-vis other job attributes. For instance due to differences in the level of unemployment in each country, differences in how easy it is for employers to fire permanent employees or differences in the welfare systems. In order to investigate whether this attribute is driving the results, we estimated the chopit model including only vignettes with contract type "Permanent with almost no risk of losing the job". Again, the results (available upon request) do not change the picture described above and do not alter the overall conclusion.

### 4.3 Discussion and Implications

Cross-country differences in satisfaction, well-being and other subjective measures such as job satisfaction have been remarkably persistent across time. Inglehart and Klingemann (2000) refute the idea that cross-country differences should adhere to problems with translating questions and phrasing "satisfaction" adequately comparable across countries. Instead they argue that cross-cultural differences in well-being reflect societies' historical experiences and note that this may explain why country differences are so stable over time. They find that economic development and experience of communistic ruling of government are the two leading explanations for cross-country differences.

Our findings offer an alternative explanation for cross-country differences. We find that individuals in different cultures have varying standards for what constitutes particular levels of job satisfaction, and this has important bearings on their responses to subjective questions. When we control for the actual content of the job (through vignettes), the ranking between countries changes.

A consequence of our results is that one should be careful in interpreting parameter estimates of country dummies from a traditional cross-country job satisfaction regression in such a way that for instance the Danish or Finnish labor markets are better appreciated by workers than in other countries. Our results suggest this might be due to cross-country differences in answering

questions of job satisfaction. In fact, this study instead points to the Dutch model as the best in terms of job satisfaction. In slightly more technical terms, this means that country dummies in a “traditional” cross-country ordered probit regression of the type we have shown in Table 5 pick up effects that are not captured by the other explanatory variables and that are country specific. These effects may reflect either unobservable institutional factors or cultural differences in how individuals answer questions on job satisfaction. And, if one wants to base policy recommendations on country effects from research like this, the effects should be free of bias stemming from cultural differences.

Our results are also relevant for a wider public policy debate, which is currently going on regarding the broader, but closely related concept of life satisfaction. For instance, Kahneman et al. (2004, p. 430) note that the country differences in life satisfaction surveys “appear implausibly large”. Thus, if policy suggestions regarding how peoples’ life satisfaction should be increased are based on cross-country comparisons, one should apply techniques similar to the kind applied in this paper.

But are the results based upon the chopit model really all that different? If not, it may largely be safe to make direct country comparison and perhaps simply note that some caution is in order when interpreting ones results. While this may be one way of interpreting the two country rankings listed in Table 6 it misses the fact that the country dummy for Denmark turns from significantly positive to significantly negative. Furthermore, testing the null hypothesis that the two country rankings, ordered vis-à-vis full-fledged chopit, are independent cannot be rejected (Kendall’s tau is 0.54).

## 5 Concluding Remarks

In this paper, we apply conjoint analysis techniques in order to control for cultural differences in the way individuals from different countries perceive subjective questions about job satisfaction.

Using a standard ordered probit model with a ‘standard’ set of covariates, we obtain results much in line with previous studies, i.e. we find that employees in Denmark report the highest level of job satisfaction followed by Finnish workers. Once we include more covariates, that describe the respondents’ jobs in great detail, the country dummies are somewhat reshuffled. For instance, Denmark and Finland swap position in the country rankings. This indicates that omitted variable bias partly may be driving usual findings on cross country differences in job satisfaction or overall well-being



When we include the full set of job characteristics, the chopit model results, where threshold parameters have been rescaled through vignette anchoring, alter the country ranking and place the Netherlands in the top, Greece second and Denmark third while Finland drops to a fourth place, out of seven EU countries. France and the UK also increase their ranking while Spain drops from a fifth position to be the lowest ranked country out of the seven. Thus, our results implicate that cross-country comparisons of subjective answers of job satisfaction that are done without vignette anchoring may be misleading. In the particular case of job satisfaction cross-country comparison applied here, we conclude that, if anything, the Dutch rather than the Danish or Finnish labor markets should serve as a role model to enhance job satisfaction in other countries. That we question simple cross-country comparison of job satisfaction corroborates studies of subjective assessment of health (Salomon et al. 2004) and political freedom (King et al. 2004). Another interesting implication of the mentioned research taken together with our contribution is that these results suggest that the large literature on cross-country comparisons of well-being and satisfaction with life also needs to be revised by applying similar re-scaling techniques.

However, the main point we wish to make is that, contrary to the quotes by Layard and Veenhoven in our introduction, the results reported here provide the first evidence that there are indeed cultural differences in reporting of satisfaction. Hence, we wish to raise a flag of concern with simple cross-country comparisons.

Future analyses could also include applying the chopit model to panel data. The analysis here is limited by the fact that we only observe a cross section of respondents, and hence we are unable to control for unobserved individual effects, which may capture individual personality traits. As noted in Diener and Lucas (1999), researchers in psychology have found that personality (inherit in the genes) accounts for up to 80 percent of subjective well-being, and this points to the importance of being able to control for individual-specific effects.

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## A Appendix: The Likelihood Function

The joint likelihood can be split into a part for the self-assessment of job satisfaction and a part for vignettes.

The likelihood for the self-assessment component reads

$$L_s(\beta, \gamma \mid js) \propto \prod_{i=1}^N \prod_{k=1}^{10} \left[ F(\tau_i^k \mid X_i \beta) - F(\tau_i^{k-1} \mid X_i \beta) \right]^{\mathbf{I}(js_i=k)}$$

The likelihood for the vignette component reads

$$L_v(\theta, \gamma \mid v) \propto \prod_{l=1}^L \prod_{j=1}^5 \prod_{k=1}^{10} \left[ F(\tau_l^k \mid \theta_j, \sigma^2) - F(\tau_l^{k-1} \mid \theta_j, \sigma^2) \right]^{\mathbf{I}(v_l,j=k)}$$

where the product is estimated over observations, vignettes and response categories, respectively.

The likelihoods needs to be estimated jointly as they share the same parameter vector  $\gamma$ . The joint likelihood therefore becomes

$$L(\beta, \theta, \gamma \mid js, v) = L_s(\beta, \gamma \mid js) \times L_v(\theta, \gamma \mid v).$$

## B Appendix: Attribute Levels

### Attributes and attribute-levels in the survey

Job attribute	Possible Values
1.- Salary	-50%, -40%,..., same as now, 10%,..., 50%
2.- Type of contract	1) Permanent With almost no risk of losing the job 2) Permanent With risk of losing the job with severance pay. 3) Permanent With risk of losing the job with no severance pay. 4) One-year contract High probability of continuation with a permanent contract. 5) One-year contract High probability of continuation with another temporary contract. 6) One-year contract No probability of continuation.
3.- Working hours	Any number between 10 and 50, round-off to 10
4.- Start/ending times – Round the clock production	1) Flexible working times. 2) Work starts at the usual time. You can however choose on which days to work. 3) Rotating shift system. 4) The employer decides about the working times (not in the night) and may change them monthly.
5.- Access to training opportunities	1) The employer will offer you a 3 months training program in the course of the year. 2) The employer will offer you a 1 month training program in the course of the year. 3) The employer will offer you a 5 workdays training program in the course of the year. 4) The employer will offer you a 1 workday training in the course of the year 5) The company will not offer you a specific training
6.- Work organization	1) The job does not involve teamwork. 2) The job involves working in a varying team. 3) The job involves working in a fixed team.

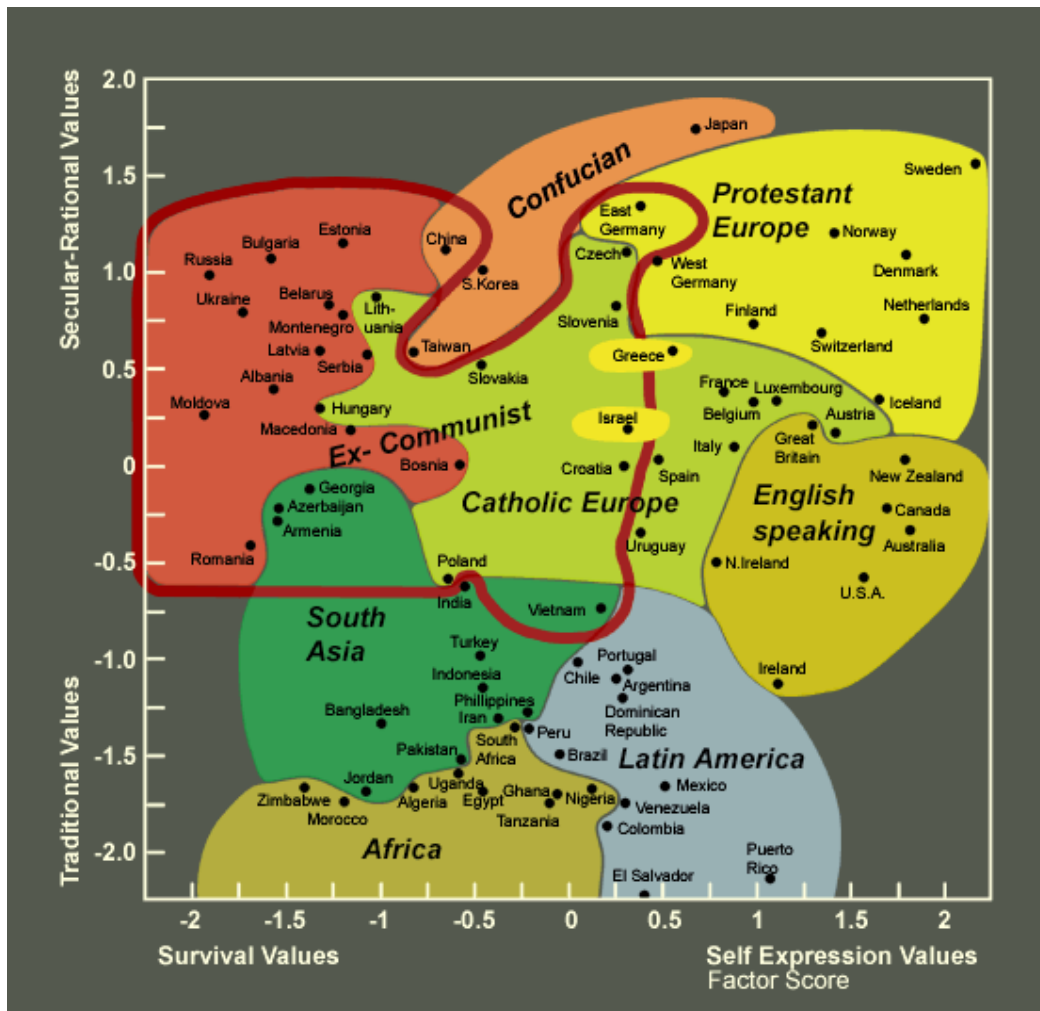
7.- Control over own work	<p>1) The job has a completely fixed routine, which you cannot influence.</p> <p>2) Your job tasks are fixed, but you may decide on when and how things are done.</p> <p>3) No one controls your work.</p>
8.- Intensity	<p>1) The job is very demanding, which means that you will have to work most of the time at high speed.</p> <p>2) The job is fairly demanding, which means that sometimes you may have to work at high speed.</p> <p>3) The job is not very demanding, which means that you will rarely have to work at high speed.</p> <p>4) The job is very demanding, which means that most of the time you will have to meet tight deadlines.</p> <p>5) The job is fairly demanding, which means that sometimes you may have to meet tight deadlines.</p> <p>6) The job is not very demanding, which means that you will rarely have to meet tight deadlines.</p>
9.- Time of retirement & labor disability	<p>1) You will have to stop before retirement age</p> <p>2) You can retire at age X.</p> <p>3) This company has no early retirement plans.</p>
10.- Akerlof theory	<p>1) Same working conditions as in other firms No loyalty from both sides Shirking and low performance is possible.</p> <p>2) Same working conditions as in other firms Loyalty from both sides Shirking and low performance work is impossible</p>

## C Appendix: Description and definition of variables

Name of variable	Description of variable
Country indicator	Indicator=1 if respondent from that country. Reference group=The Netherlands
Age, age squared	Age in years
Ln(income)	Natural logarithm of monthly income. All amounts are measured in Euros. The exchange rate from DKK to Euro is 7.45.
Ln(hours)	Natural logarithm of hours worked per week (main job only)
Female	Indicator=1 if respondent is female
Low education	Indicator=1 if respondent has primary education as highest completed education
Union	Indicator=1 if member of a union
Commuting time	Time in minutes
Job quality low	Indicator=1 if sometimes dangerous & sometimes physically tiring & sometimes bad physical environment
Job quality bad	Indicator=1 if often dangerous & often physically tiring & often bad physical environment
# times illness due to job	Number of times during the last 2 years where respondent got a work related disease that caused him/her had to stay home for at least 1 day.
# times injured due to job	Number of times during the last 2 years where respondent was injured at work to an extent so that he/she had to stay home for at least 1 day.
Speed	Indicator=1 if hard speed and hard deadlines both score above 3 on a scale from 1 (low/seldom) to 5 (high/often)
Repetitive work	Indicator=1 if current job has many repetitive tasks
Promotion	Indicator=1 if respondent believes it is likely or very likely that he/she will be promoted in current job.
Firm size	Various intervals of number of employees
Fixed work time	Indicator=1 if fixed work time
Permanent contract	Indicator=1 if permanent contract
Tenure, tenure squared	Measured in years
Never training	Indicator=1 if respondent never receives training in current job
Occupation indicators	10 occupation indicators (reference group is managers): professional, technical, clerk, craft, public service and care, manufacturing, sales service, plant operator, army, other



## D Appendix: The Inglehart Value Map



Source: <http://www.worldvaluessurvey.org/statistics/index.html>.

## E Appendix: Tables

**Table 1 Average satisfaction for vignette sets, by country**

Vignette set	Den.	France	Greece	Neth.	Spain	Finland	UK
Vignettes 1-5	3.69 (1.31)	3.45 (1.52)	4.09 (1.50)	4.00 (1.25)	4.00 (1.27)	4.84 (1.48)	3.70 (1.35)
Vignettes 6-10	4.46 (1.37)	4.46 (1.53)	4.71 (1.33)	4.98 (1.04)	5.98 (1.44)	4.91 (1.55)	4.48 (0.97)
Vignettes 11-15	3.82 (1.86)	4.27 (1.71)	4.40 (1.45)	4.62 (1.48)	5.58 (0.96)	5.80 (1.15)	4.20 (1.47)
Vignettes 16-20	4.31 (1.31)	3.63 (1.71)	4.04 (1.49)	4.02 (1.48)	5.55 (1.34)	4.85 (1.07)	4.27 (1.50)
Vignettes 21-25	4.36 (1.77)	3.91 (1.52)	4.04 (1.75)	4.50 (1.46)	5.16 (1.68)	5.40 (1.75)	3.95 (1.42)
Vignettes 26-30	3.26 (1.37)	3.47 (1.83)	4.08 (1.35)	3.33 (1.52)	3.71 (1.35)	4.66 (1.57)	3.75 (1.33)
Vignettes 31-35	3.89 (1.47)	n.a.	3.63 (1.50)	3.75 (1.71)	3.98 (1.63)	4.62 (1.37)	3.37 (1.67)
Vignettes 36-40	5.17 (1.40)	4.52 (1.37)	4.80 (1.89)	4.94 (1.53)	6.21 (1.45)	5.72 (1.31)	4.97 (1.53)
Vignettes 41-45	3.75 (1.59)	3.86 (1.81)	4.16 (1.34)	4.15 (1.29)	4.35 (1.37)	6.04 (0.83)	3.79 (1.34)
Vignettes 46-50	3.68 (1.33)	3.65 (1.19)	4.12 (1.37)	3.29 (1.37)	4.76 (1.03)	4.89 (1.17)	3.55 (1.34)
Vignettes 51-55	4.50 (1.27)	4.57 (1.53)	4.34 (1.43)	4.74 (1.37)	5.56 (1.52)	5.84 (1.20)	4.72 (1.39)
Vignettes 56-60	4.23 (1.46)	4.43 (1.52)	4.00 (1.27)	4.10 (1.49)	5.11 (1.54)	5.54 (1.15)	4.32 (1.14)
Vignettes 61-65	3.68 (1.36)	3.19 (1.75)	3.53 (1.64)	3.29 (1.45)	4.43 (1.37)	4.80 (1.18)	3.50 (1.16)
Vignettes 66-70	3.45 (1.95)	3.44 (1.84)	4.17 (1.21)	3.89 (1.47)	3.84 (0.97)	4.93 (1.33)	3.42 (1.25)
Vignettes 71-75	3.35 (1.34)	3.82 (1.40)	4.48 (1.31)	3.79 (1.41)	4.55 (1.33)	4.54 (1.36)	3.92 (1.38)
Vignettes 76-80	3.12 (1.45)	3.36 (1.94)	3.39 (1.22)	3.57 (1.63)	4.20 (1.94)	4.39 (1.52)	2.70 (1.35)
Vignettes 81-85	4.81 (1.41)	4.43 (1.57)	4.37 (1.56)	4.82 (1.48)	5.91 (1.46)	5.78 (1.88)	4.38 (1.63)
Vignettes 86-90	4.49 (1.20)	4.13 (1.66)	4.50 (1.33)	4.44 (1.36)	5.19 (1.02)	5.91 (1.06)	4.67 (1.33)
Vignettes 91-95	3.56 (1.73)	3.83 (1.44)	3.65 (1.15)	3.83 (1.51)	4.83 (1.57)	4.92 (1.37)	3.77 (1.30)

*Note:* Standard deviations in parentheses.

**Table 2 Ranking of vignette sets, by country**

	Denmark	France	Greece	Neth.	Spain	Finland	UK
Vignettes 1-5	12	15	11	11	16	14	14
Vignettes 6-10	5	3	2	1	2	11	4
Vignettes 11-15	10	6	5	5	4	4	8
Vignettes 16-20	7	13	13	10	6	13	7
Vignettes 21-25	6	8	13	6	8	8	9
Vignettes 26-30	18	14	12	17	19	16	13
Vignettes 31-35	9	n.a	17	15	17	17	18
Vignettes 36-40	1	2	1	2	1	6	1
Vignettes 41-45	11	9	9	8	14	1	11
Vignettes 46-50	13	12	10	18	11	12	15
Vignettes 51-55	3	1	7	4	5	3	2
Vignettes 56-60	8	4	15	9	9	7	6
Vignettes 61-65	14	18	18	19	13	15	16
Vignettes 66-70	16	16	8	12	18	9	17
Vignettes 71-75	17	11	4	14	12	18	10
Vignettes 76-80	19	17	19	16	15	19	19
Vignettes 81-85	2	5	6	3	3	5	5
Vignettes 86-90	4	7	3	7	7	2	3
Vignettes 91-95	15	10	16	13	10	10	12

**Table 3 Satisfaction with vignette set, country ranking**

	Denmark	France	Greece	Neth.	Spain	Finland	UK
Vignettes 1-5	6	7	2	4	3	1	5
Vignettes 6-10	6	7	4	2	1	3	5
Vignettes 11-15	7	5	4	3	2	1	6
Vignettes 16-20	3	7	5	6	1	2	4
Vignettes 21-25	4	7	5	3	2	1	6
Vignettes 26-30	7	5	2	6	4	1	3
Vignettes 31-35	3	n.a	5	4	2	1	6
Vignettes 36-40	3	7	6	5	1	2	4
Vignettes 41-45	7	5	3	4	2	1	6
Vignettes 46-50	4	5	3	7	2	1	6
Vignettes 51-55	6	5	7	3	2	1	4
Vignettes 56-60	5	3	7	6	2	1	4
Vignettes 61-65	3	7	4	6	2	1	5
Vignettes 66-70	5	6	2	3	4	1	7
Vignettes 71-75	7	5	3	6	1	2	4
Vignettes 76-80	6	5	4	3	2	1	7
Vignettes 81-85	4	5	7	3	1	2	6
Vignettes 86-90	5	7	4	6	2	1	3
Vignettes 91-95	7	3	6	4	2	1	5

**Table 4 Comparison of ordered probit regression results, with and without detailed job characteristics**

	(1)			(2)		
	Ordered Probit			Ordered Probit		
	Coef.	Std. Err.		Coef.	Std. Err.	
<i>Explanatory variables</i>						
Country indicator (ref=NI)						
Denmark	0.177	(0.052)	**	0.231	(0.059)	**
Spain	-0.146	(0.076)		-0.117	(0.081)	
Finland	0.147	(0.073)	*	0.351	(0.078)	**
Greece	-0.014	(0.061)		0.119	(0.069)	
UK	-0.240	(0.054)	**	-0.291	(0.057)	**
France	-0.200	(0.052)	**	-0.195	(0.054)	**
age	0.007	(0.002)	**	0.014	(0.011)	
age squared				0.000	(0.001)	
ln(income)	0.121	(0.028)	**	0.091	(0.032)	**
ln(hours)	-0.017	(0.055)		-0.034	(0.066)	
female	0.108	(0.031)	**	0.107	(0.032)	**
low education	0.029	(0.042)		0.085	(0.043)	*
union member				-0.039	(0.039)	
commuting time (min)				-0.003	(0.001)	**
qlow				-0.060	(0.045)	
qbad				-0.110	(0.072)	
# times illness due to job				-0.007	(0.007)	
# times injured due to job				-0.075	(0.021)	**
speed				-0.128	(0.037)	**
repetitive				-0.268	(0.034)	**
promotion				0.421	(0.035)	**
firm size (ref > 99)						
1-9				0.067	(0.046)	
10-24				-0.026	(0.047)	
25-99				-0.007	(0.041)	
fix work time				-0.028	(0.032)	
permanent contract				0.011	(0.044)	
tenure				-0.007	(0.006)	
tenure squared				0.000	(0.001)	
Never received training (ref=at least some training)				0.053	(0.035)	
Control for 10 occupation indicators						
	no			yes		
log likelihood	-62,870			-61,154		

*Note:* Standard errors in parentheses. \*\* = significant at the 1% level, \* = significant at the 5% level. Threshold parameter estimates not shown.

**Table 5 Parameter estimates, Ordered probit and Chopit with and without covariates in threshold equation**

	(1)			(2)			(3)		
	Ordered Probit			CHOPIT (Z=0)			CHOPIT		
	Coef.	Std. Err.		Coef.	Std. Err.		Coef.	Std. Err.	
<i>Explanatory variables</i>									
Country indicator (ref=NI)									
Denmark	0.231	(0.059)	**	0.266	(0.059)	**	-0.097	(0.071)	
Spain	-0.117	(0.081)		-0.176	(0.081)	*	-0.788	(0.095)	**
Finland	0.351	(0.078)	*	0.426	(0.079)	**	-0.244	(0.094)	**
Greece	0.119	(0.069)		0.136	(0.069)	*	-0.050	(0.082)	
UK	-0.291	(0.057)	**	-0.411	(0.057)	**	-0.646	(0.069)	**
France	-0.195	(0.054)	**	-0.271	(0.055)	**	-0.520	(0.066)	**
age	0.014	(0.011)	**	0.003	(0.011)		0.048	(0.013)	**
age squared	0.000	(0.001)		0.000	(0.001)		0.000	(0.001)	*
ln(income)	0.091	(0.032)	**	0.089	(0.033)	**	0.124	(0.039)	**
ln(hours)	-0.034	(0.066)		-0.132	(0.072)		-0.426	(0.086)	**
female	0.107	(0.032)	**	0.114	(0.033)	**	0.135	(0.039)	**
low education	0.085	(0.043)		0.094	(0.043)	*	-0.014	(0.052)	
union member	-0.039	(0.039)		-0.048	(0.039)		-0.050	(0.039)	
commuting time (min)	-0.003	(0.001)	**	-0.003	(0.001)	**	-0.003	(0.001)	**
job quality low	-0.060	(0.045)		-0.081	(0.046)		-0.087	(0.046)	
job quality bad	-0.110	(0.072)		-0.138	(0.073)		-0.132	(0.073)	
# times illness due to job	-0.007	(0.007)		-0.009	(0.007)		-0.008	(0.007)	
# times injured due to job	-0.075	(0.021)	**	-0.092	(0.021)	**	-0.091	(0.021)	**
speed	-0.128	(0.037)	**	-0.151	(0.038)	**	-0.158	(0.038)	**
repetitive	-0.268	(0.034)	**	-0.351	(0.035)	**	-0.347	(0.035)	**
promotion	0.421	(0.035)	**	0.529	(0.035)	**	0.526	(0.035)	**
firm size (ref > 99)									
1-9	0.067	(0.046)		0.077	(0.046)		0.076	(0.047)	
10-24	-0.026	(0.047)		-0.042	(0.047)		-0.047	(0.047)	
25-99	-0.007	(0.041)		-0.010	(0.041)		-0.010	(0.042)	
fix work time	-0.028	(0.032)		-0.042	(0.032)		-0.043	(0.032)	
permanent contract	0.011	(0.044)		0.021	(0.044)		0.021	(0.044)	
tenure	-0.007	(0.006)		-0.006	(0.006)		-0.006	(0.006)	
tenure squared	0.000	(0.001)		0.000	(0.001)		0.000	(0.001)	
Never received training (ref=at least some training)	0.053	(0.035)		0.068	(0.035)	*	0.067	(0.035)	
Control for 10 occupation indicators			yes			yes			yes

### *Thresholds*

#### **threshold 1**

Denmark					0.175	(0.044)	**		
Spain					-0.060	(0.071)			
Finland					-0.421	(0.075)	**		
Greece					-0.026	(0.054)			
UK					0.133	(0.047)	**		
France					0.434	(0.044)	**		
age					0.040	(0.009)	**		
age squared					0.000	(0.001)	**		
ln(income)					0.017	(0.027)			
ln(hours)					-0.273	(0.058)	**		
female					-0.044	(0.027)			
low education					0.076	(0.035)	*		
constant	-1.141	(0.011)	**	-2.866	(0.438)	**	-3.175	(0.527)	**

#### **threshold 2**

Denmark					0.150	(0.075)	*	
Spain					-0.158	(0.132)		
Finland					0.099	(0.128)		
Greece					0.256	(0.087)	**	
UK					0.025	(0.081)		
France					-0.204	(0.081)	*	
age					0.022	(0.015)		
age squared					0.000	(0.001)		
ln(income)					-0.061	(0.038)		
ln(hours)					-0.151	(0.089)		
female					0.039	(0.046)		
low education					-0.083	(0.061)		
constant	-0.826	(0.009)	**	-0.884	(0.026)	**	-0.307	(0.428)

#### **threshold 3**

Denmark					0.102	(0.066)	
Spain					0.017	(0.107)	
Finland					-0.173	(0.121)	
Greece					0.279	(0.0765)	**
UK					0.214	(0.0691)	**
France					-0.030	(0.071)	
age					0.020	(0.013)	
age squared					0.000	(0.001)	
ln(income)					0.047	(0.036)	
ln(hours)					-0.126	(0.079)	
female					0.019	(0.039)	
low education					-0.200	(0.056)	**
constant	-0.498	(0.009)	**	-0.822	(0.023)	**	-1.143 (0.376) **

#### **threshold 4**

Denmark					0.038	(0.061)	
Spain					0.046	(0.092)	
Finland					0.123	(0.091)	
Greece					0.088	(0.071)	
UK					0.100	(0.063)	
France					-0.137	(0.065)	*
age					-0.010	(0.0114)	
age squared					0.000	(0.001)	
ln(income)					0.023	(0.034)	
ln(hours)					0.173	(0.077)	*
female					0.042	(0.036)	
low education					-0.095	(0.051)	
constant	-0.177	(0.008)	**	-0.837	(0.021)	**	-1.473 (0.356) **

**threshold 5**

Denmark					-0.251	(0.064)	**
Spain					-0.234	(0.099)	*
Finland					-0.113	(0.094)	
Greece					-0.045	(0.072)	
UK					-0.094	(0.066)	
France					-0.236	(0.065)	**
age					-0.001	(0.0123)	
age squared					0.000	(0.001)	
ln(income)					-0.011	(0.036)	
ln(hours)					0.105	(0.081)	
female					0.016	(0.039)	
low education					0.048	(0.051)	
constant	0.086	(0.008)	**	-1.028	(0.022)	**	-1.189 (0.381) **

**threshold 6**

Denmark					-0.135	(0.056)	*
Spain					-0.081	(0.084)	
Finland					-0.132	(0.083)	
Greece					-0.071	(0.066)	
UK					-0.107	(0.059)	
France					0.064	(0.054)	
age					-0.005	(0.011)	
age squared					0.000	(0.001)	
ln(income)					-0.033	(0.032)	
ln(hours)					-0.123	(0.069)	
female					0.044	(0.034)	
low education					0.064	(0.043)	
constant	0.425	(0.008)	**	-0.779	(0.021)	**	-0.026 (0.325)

**threshold 7**

Denmark					-0.542	(0.062)	**
Spain					-0.400	(0.088)	**
Finland					-0.365	(0.084)	**
Greece					-0.508	(0.074)	**
UK					-0.370	(0.063)	**
France					-0.469	(0.062)	**
age					0.002	(0.012)	
age squared					0.000	(0.001)	
ln(income)					0.017	(0.037)	
ln(hours)					0.005	(0.081)	
female					0.024	(0.039)	
low education					-0.038	(0.051)	
constant	0.721	(0.009)	**	-0.935	(0.021)	**	-0.624 (0.376)

**threshold 8**

Denmark					-0.524	(0.057)	**
Spain					-0.305	(0.076)	**
Finland					-0.167	(0.069)	*
Greece					-0.360	(0.064)	**
UK					-0.460	(0.059)	**
France					-0.447	(0.058)	**
age					-0.022	(0.011)	*
age squared					0.000	(0.001)	*
ln(income)					-0.034	(0.033)	
ln(hours)					0.190	(0.074)	*
female					-0.019	(0.035)	
low education					-0.076	(0.045)	
constant	1.148	(0.011)	**	-0.605	(0.019)	**	-0.272 (0.341)

**threshold 9**

Denmark					-0.361	(0.056)	**	
Spain					-0.495	(0.085)	**	
Finland					-0.099	(0.068)		
Greece					-0.294	(0.068)	**	
UK					-0.456	(0.063)	**	
France					-0.589	(0.064)	**	
age					0.001	(0.011)		
age squared					0.000	(0.001)		
ln(income)					0.057	(0.035)		
ln(hours)					-0.013	(0.075)		
female					0.002	(0.035)		
low education					-0.162	(0.048)	**	
constant	1.737	(0.013)	**	-0.334	(0.019)	**	-0.356	(0.348)

**threshold 10**

Denmark						-0.112	(0.102)	
Spain						-0.050	(0.135)	
Finland						0.456	(0.119)	**
Greece						0.290	(0.121)	*
UK						0.017	(0.112)	
France						-0.325	(0.111)	**
age						-0.021	(0.017)	
age squared						0.000	(0.001)	
ln(income)						0.196	(0.052)	**
ln(hours)						-0.102	(0.118)	
female						0.059	(0.055)	
low education						-0.127	(0.076)	
constant	2.220	(0.017)	**	-0.566	(0.027)	**	-0.995	(0.544)

ln $\sigma$				0.149	(0.013)		0.139	(0.013)	**
log likelihood	-61,154			-57,494			-56,705		
$\theta$ values	no			yes			yes		

*Note:* Standard errors in parentheses. \*\* = significant at the 1% level, \* = significant at the 5% level.



**Table 6 Country rankings**

<b>Rank</b>	<b>Ordered Probit</b>	<b>Chopit (Z=0)</b>	<b>Chopit</b>
1	Finland	Finland	Netherlands
2	Denmark	Denmark	Greece
3	Greece	Greece	Denmark
4	Netherlands	Netherlands	Finland
5	Spain	Spain	France
6	France	France	UK
7	UK	UK	Spain