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Climbing the ladders of job satisfaction and employee organizational commitment: cross-country evidence using a semi-nonparametric approach

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ABSTRACT

Satisfied and committed employees play a major positive role in business performance in today's globalized and competitive landscape. This paper contributes to the literature on the empirical determinants of job satisfaction and organizational commitment, drawing on a rich micro dataset for 36 countries, using a flexible semi-nonparametric approach, which nests and outperforms the standard ordered probit model. The findings indicate that job satisfaction and organizational commitment can be fostered by instruments which can be controlled by management. Our results shed timely light on how managers can improve job satisfaction and organizational commitment and address implications of the Great Resignation. However, despite the ever-increasing pace of globalization and expanding role of multinationals across the globe in shaping work environments, our results uncover that significant cross-country differences in job satisfaction and organizational commitment do exist, even after controlling for a plethora of job-and-workplace manageable attributes and individual (including religious dimensions) related characteristics.

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great resignation

1. Introduction

In today's competitive landscape, human resources are increasingly recognized as the most valuable assets to any organization (Fulmer & Ployhart, 2014). Consequently, strategic human resources management plays a fundamental role in increasing employees' job satisfaction and organizational commitment and consequently business performance (Brown et al., 2011). Within this context, researchers and human resource practitioners consider employees' satisfaction as a critical goal to be achieved, which influences their commitment and other positive behavioral attitudes towards the organization (Brown et al., 2011).

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Therefore, there is a growing body of empirical literature on the determinants of employees' job satisfaction within human resource management and organizational behavior literature or, more broadly, in economics, psychology, and sociology (Belfield & Harris, 2002; Borjas, 1979; Clark, Oswald, 1996; Idson, 1990; Johnson & Johnson, 2002; Judge & Hulin, 1993; Judge et al., 2002; King & Williamson, 2005; Souza-Poza & Souza-Poza, 2003; Vieira, 2005; Westover & Taylor, 2010) and how such satisfaction relates to employees' level of organizational commitment (Harter et al., 2002; Rayton, 2006; Saridakis et al., 2018; Valaei & Rezaei, 2016) and organizational performance (e.g., Harter et al., 2002; Koys, 2001).

This paper adds novel empirical evidence to the literature on job satisfaction and employee organizational commitment and its managerial implications. In order to achieve this objective, we address the following questions. First, we inquire if there are specific job satisfaction enhancing variables at managers' disposal, or if job-satisfaction is intrinsic to workers (e.g., their demographics or religious beliefs). Second, we evaluate the extent to which employee organizational commitment is explained by job satisfaction. To answer these questions, we analyze a vast, detailed, rich sample of employees for a large number of countries – 36 – using a robust yet flexible semi-nonparametric model, of which the ordered probit model is a particular, restricted case. We focus on cross-country differences, as the data allow to isolate cross-country differences, after controlling for a rich plethora of job and workplace-related characteristics, in addition to individual related characteristics, including religious beliefs and practices. The results indicate that the conventional ordered probit model, which needs a distributional assumption about the error term, is rejected in favor of the proposed more flexible semi-nonparametric alternative, validating, thus, our approach. Moreover, the findings suggest that while not all determinants of workers' job satisfaction can be influenced by management, it is most interesting to note that indeed some instruments that increase job satisfaction are available to managers and controlled by managers. The results also indicate that increasing job satisfaction increases employees' organizational commitment. In addition, certain determinants of job satisfaction also exert a direct (not only indirect) effect on employee organizational commitment. Quite interestingly, there are striking cross-country differences on the determinants of job satisfaction and employee organizational commitment even after controlling for a rich plethora of job, workplace, and individual characteristics (including cultural and religious beliefs), which researchers and human resources managers alike ought to consider.

The paper is organized as follows. [Section 2](#) reviews the literature on job satisfaction and employee organizational commitment. [Section 3](#) presents the conceptual framework, the hypotheses to be tested, the data set collected, and the statistical and micro-econometric model used. [Section 4](#) presents the estimation results and discusses the findings. Finally, [Section 5](#) contains the main conclusions and directions for further research.

2. Literature review

2.1. Job satisfaction

In general, in the literature the concept of job satisfaction expresses the degree to which one feels positively or negatively about his or her job and involves a subjective evaluation

of many work-specific factors such as pay, work autonomy, occupational prestige, supervision, promotional opportunities, and workplace relations (Clark, Oswald, 1996; Rayton, 2006; Saridakis et al., 2018; Wood & Ogbonnaya, 2018). For instance, Newstorm (2007) summarizes it as “a set of favorable or unfavorable feelings and emotions with which employees view their work.” Other definitions can be found in Spector (1997), Judge and Kammeyer-Mueller (2012), and Frederici and Skaalvik (2012).

There is also a debate on how one can measure job satisfaction (Judge & Kammeyer-Mueller, 2012; van Saane et al., 2003). Regardless of the exact definition of job satisfaction, it has long been found in the literature that employees’ reported feelings towards their job do convey useful managerial information on individual behavior and organizational performance (Akerlof et al., 1988; Harter et al., 2002; Hellman, 1997; Rayton, 2006; Saridakis et al., 2018; Shields & Price, 2002).

Several motivational theories have been used to address job satisfaction, including the needs hierarchy theory (Maslow, 1943), two-factor theory (Herzberg et al., 1959), X and Y theory (McGregor, 1960), needs achievement theory (McClelland, 1961), equity theory (Adams, 1963), expectancy theory (Vroom, 1964), goal setting theory (Locke, 1968), and job characteristics theory (Hackman & Oldham, 1976). These theoretical frameworks have guided empirical work on the determinants and outcomes of job satisfaction. At the empirical level, some studies have examined overall job satisfaction, while others have focused on satisfaction with a specific aspect of the job (Saridakis et al., 2018).

There is evidence that one’s job satisfaction relates to a diversity of job-related characteristics, although the findings are not completely consistent across studies, such as pay (Clark, Oswald, 1996; Heywood & Wei, 2006; Pouliakas & Ioannis, 2010), hours of work (Clark, Oswald, et al., 1996), job security (Artz & Kaya, 2014), promotion opportunities (Clark, 1998), job stress (Wang et al., 2014), work autonomy (Ross & Reskin, 1992), workplace relations with co-workers and management (Westover & Taylor, 2010), job-skill use (Allen & van der Velden, 2001; Amador & Vila, 2013; Belfield & Harris, 2002; Johnson & Johnson, 2002; Vieira, 2005), and job-life interference (Anderson et al., 2002; Scandura & Lankau, 1997).

Several authors have also examined the role of socio-demographic characteristics as explanatory variables for job satisfaction, such as gender (Clark, 1997; Linz, 2003; Souza-Poza & Souza-Poza, 2003; Witt & Neal, 1992), age (Chaudhuri et al., 2015; Clark, Oswald, et al., 1996; Linz, 2003; Saner & Eyüpoğlu, 2012), education (Clark, Oswald, 1996; Clark, Oswald, et al., 1996; Idson, 1990; Linz, 2003; Ross & Reskin, 1992; Vila & García-Mora, 2005), marital status (Clark, Oswald, et al., 1996; Linz, 2003; Saner & Eyüpoğlu, 2013), region or country (Borooah, 2009; Bozionelos & Kostopoulos, 2010; Díaz-Serrano & Vieira, 2005; Jones & Sloane, 2009; Mysíková & Večerník, 2013), union membership (Borjas, 1979; Clark, Oswald, et al., 1996; García-Serrano, 2008; Hammer & Avgar, 2005; Renaud, 2002), religious beliefs (King & Williamson, 2005), and public service *versus* private-sector employment (Top et al., 2015).

2.2. Organizational commitment

It is widely recognized that employees’ organizational commitment plays an important role in any organization, linked to important competitive advantages, such as employee turnover, absenteeism, and performance (Brown et al., 2011; Mowday et al., 1979;

Walton, 1985). Price (1997) defined organizational commitment as loyalty to a social unit. Others refer to it as the strength of identification and involvement with an organization (Mowday et al., 1979). Mowday et al. (1979) identified the following three components of organizational commitment: a strong belief in the organization's goals and values, a willingness to exert considerable effort on behalf of it, and a strong intent to remain employed by the organization. Meyer and Allen (1991, 1997) refer to one's organizational commitment as a psychological state that has at least three separable components: affective commitment (a desire), continuance commitment (a need), and normative commitment (an obligation) to maintain employment in an organization. *Affective commitment* is an attitudinal process that involves employees' identification with, attachment to, and involvement in the organization's efforts to share its values and goals. *Continuance commitment* relates to employees' awareness of the costs associated with leaving the organization. *Normative commitment* reflects the feeling of obligation towards the organization based on their personal values and beliefs. In general, commitment captures the worker-employer ties or attachment.

Several studies have examined the determinants of organizational commitment, although the findings are not completely consistent across different studies. Such research has addressed the explanatory role of variables including rewards or compensation (Paik et al., 2007), job-life balance (Azeem & Akhtar, 2014) and demographic characteristics such as gender (Mathieu & Zajac, 1990), age (Allen & Meyer, 1993; Suliman & Lies, 2000; Yucel & Bektas, 2012), and education (González et al., 2016). A close reading of empirical studies suggests that many determinants of job satisfaction also impact organizational commitment. The extent to which their effect on organizational commitment is direct, indirect (via the mediating effect of job satisfaction), or both is an important empirical issue in the literature. This study contributes to the literature in this regard.

2.3. Connecting job satisfaction and organizational commitment

The existing empirical evidence on job satisfaction and organizational commitment still reflects a lack of unanimity on the causal ordering between these constructs (Saridakis et al., 2018). A vast majority of studies have evidenced that job satisfaction is an antecedent of organizational commitment (Chan & Qiu, 2011; Elangovan, 2001; Top & Gider, 2013; Top et al., 2015). However, others have proposed that organizational commitment shapes job satisfaction (Bateman & Strasser, 1984; Paik et al., 2007; Vandenberg & Lance, 1992), while some authors also view these constructs as potentially reciprocally related (Farkas & Tetrick, 1989; Huang & Hsiao, 2007; Lance, 1991; Saridakis et al., 2018).

3. Methodology, data, and the statistical model

3.1. Methodology

Figure 1 displays the conceptual framework for empirical examination, which includes the following hypotheses:

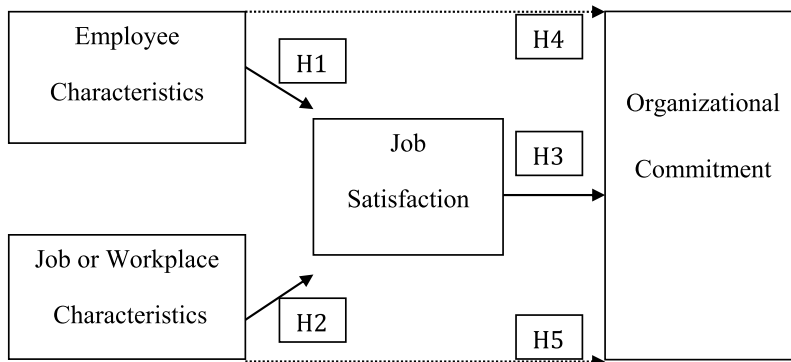


Figure 1. The conceptual model. Note: This figure depicts our proposed conceptual model to be used for empirical purposes and the corresponding hypotheses to be tested. The model considers that employee and job/workplace attributes influence job satisfaction and organizational commitment. As job satisfaction might also influence organizational commitment, this means that employee and job/workplace attributes may impact organizational commitment directly and/or also indirectly due to their effect on satisfaction. It can, however, also be the case that some attributes have no impact on organizational commitment or eventually act only through one of the channels instead of both.

H1 - Employee characteristics influence job satisfaction.^a

H2 - Job or workplace characteristics influence job satisfaction.

H3 - Job satisfaction influences organizational commitment.

To investigate H1, we test the effect of workers' characteristics on job satisfaction, controlling for confounding effects arising via observed job or workplace characteristics. If job attributes were not controlled for them, employee attributes regression coefficients could also capture the effect of those attributes due to the correlation between both variables. In H2, we test the influence of job or workplace characteristics on job satisfaction, controlling for the influence of workers' observed attributes. Despite the lack of consensus in the literature regarding the causal ordering between these two variables, we entertain in H3 job satisfaction as a determinant (even if partially) of organizational commitment, while we also consider the possibility that job satisfaction is endogenously determined with organizational commitment via an instrument variable approach.

Two additional hypotheses are necessary to close the model:

H4 - Employee characteristics have a direct impact on organizational commitment.

H5 - Job or workplace characteristics have a direct impact on organizational commitment.

In order to test H4, one must control for the effect of job satisfaction and job or workplace characteristics on organizational commitment. To test H5, we must control

for the influence of job satisfaction and employees' characteristics on organizational commitment.

Therefore, the present framework allows to examine the extent to which the effect of employee and job-and-workplace characteristics on organizational commitment runs directly is mediated by job satisfaction, or both. For instance, if such an effect is totally mediated via job satisfaction, then there is no room for any direct effect of these variables on the organizational commitment equation (otherwise, those variables will also have a direct impact).

3.2. Data

The present study uses data from the 2015 Work Orientation module of International Social Survey Program (ISSP) survey, which was implemented in 2015–2016 in a large number of countries. The national surveys include random samples of the population and include questions regarding the general and working populations. We only use data on working respondents. The final sample, after eliminating missing values on relevant variables, includes 14,437 working respondents. A similar procedure has been used by other researchers (e.g., Saridakis et al., 2018).

The survey collected information on respondents, in this case employees, including characteristics such as age, gender, education, marital status, trade union membership, religious beliefs, religious services attendance, and country of employment. The survey also includes questions on job or workplace characteristics, namely number of weekly hours worked, type of organization (public or private employer), whether the respondent supervises other workers or not in the workplace, whether the employee has recently received any training to improve skills at the workplace or elsewhere (which can be viewed as the extent to which the job provides or allows training opportunities to improve skills), perceived professional use of past experience and skills, perceived work–life balance, perceived relations in the workplace (between management and employees and between colleagues), perceived incidence of stress at work, and, finally, respondents' evaluation of their job on a five-point scale ranging from strongly disagree to strongly agree. These responses are given to statements such as a) *My job is secure*, b) *My income is high*, c) *My opportunities of advancement are high*, d) *My job is interesting*, e) *I can work independently*, f) *In my job I can help other people*, g) *My job is useful to society*, and h) *In my job I have personal contact with other people*. Table 1 presents the summary of descriptive statistics on employee and job-related characteristics, along with a description of other independent variables to be used in the regression analysis.

The survey also asked the following question: *How satisfied are you in your (main) job?* The level of satisfaction had to be reported on a seven-point scale ranging from completely dissatisfied to completely satisfied (see Table 2). Moreover, respondents were asked the extent to which they agreed or disagreed with the following three statements: a) *I am willing to work harder than I have to in order to help the firm or organization for succeed*, b) *I am proud to be working for my firm or organization*, and c) *I would turn down another job that offered quite a bit more pay in order to stay with this organization*. The levels of agreement to these

Table 1. Data and variables description.

Variable	Description	Mean	S. Dev.
Age	Reported age (years)	42.192	11.954
Age ² /100	Reported age squared	1923.0	1016.1
Female	1 if a female worker, 0 otherwise	0.5421	
Years of education	Reported education (in years)	14.618	10.051
Living in steady partnership	1 if the worker lives in steady partnership, 0 otherwise	0.6281	
Unionized worker	1 if the worker is unionized, 0 otherwise	0.2616	
Catholic	1 if affiliated with the Catholic religion, 0 otherwise	0.3008	
Protestant	1 if affiliated with the Protestant religion, 0 otherwise	0.1930	
Orthodox	1 if affiliated with the Orthodox religion, 0 otherwise	0.0616	
Other Christian religions	1 if affiliated with other Christian religions, otherwise	0.0470	
Jewish	1 if affiliated with the Jewish religion, 0 otherwise	0.0219	
Islamic	1 if affiliated the Islamic religion, 0 otherwise	0.0231	
Buddhist	1 if affiliated with the Buddhist religion, 0 otherwise	0.0175	
Hindu	1 if affiliated with the Hindu religion, 0 otherwise	0.0149	
Other Asian religions	1 if affiliated with other Asian religions, 0 otherwise	0.0329	
Other religions	1 if affiliated with other religions, 0 otherwise	0.0096	
Attendance of religious services	1 if attends religious services at least once a week, 0 otherwise	0.1076	
Australia	1 if the survey was conducted in Australia, 0 otherwise	0.0268	
Austria	1 if the survey was conducted in Austria, 0 otherwise	0.0255	
Belgium	1 if the survey was conducted in Belgium, 0 otherwise	0.0479	
Chile	1 if the survey was conducted in Chile, 0 otherwise	0.0240	
China	1 if the survey was conducted in China, 0 otherwise	0.0166	
Croatia	1 if the survey was conducted in Croatia, 0 otherwise	0.0252	
Czech Republic	1 if the survey was conducted in Czech Republic, 0 otherwise	0.0320	
Estonia	1 if the survey was conducted in Estonia, 0 otherwise	0.0315	
Finland	1 if the survey was conducted in Finland, 0 otherwise	0.0280	
France	1 if the survey was conducted in France, 0 otherwise	0.0272	
Georgia	1 if the survey was conducted in Georgia, 0 otherwise	0.0109	
Germany	1 if the survey was conducted in Germany, 0 otherwise	0.0444	
Hungary	1 if the survey was conducted in Hungary, 0 otherwise	0.0258	
Iceland	1 if the survey was conducted in Iceland, 0 otherwise	0.0298	
India	1 if the survey was conducted in India, 0 otherwise	0.0109	
Israel	1 if the survey was conducted in Israel, 0 otherwise	0.0265	
Japan	1 if the survey was conducted in Japan, 0 otherwise	0.0262	
Latvia	1 if the survey was conducted in Latvia, 0 otherwise	0.0263	
Lithuania	1 if the survey was conducted in Lithuania, 0 otherwise	0.0181	
Mexico	1 if the survey was conducted in Mexico, 0 otherwise	0.0171	
New Zealand	1 if the survey was conducted in New Zealand, 0 otherwise	0.0109	
Norway	1 if the survey was conducted in Norway, 0 otherwise	0.0431	
Philippines	1 if the survey was conducted in Philippines, 0 otherwise	0.0240	
Poland	1 if the survey was conducted in Poland, 0 otherwise	0.0189	
Russia	1 if the survey was conducted in Russia, 0 otherwise	0.0362	
Slovak Republic	1 if the survey was conducted in Slovak Republic, 0 otherwise	0.0265	
Slovenia	1 if the survey was conducted in Slovenia, 0 otherwise	0.0229	
South Africa	1 if the survey was conducted in South Africa, 0 otherwise	0.0321	
Spain	1 if the survey was conducted in Spain, 0 otherwise	0.0380	
Suriname	1 if the survey was conducted in Suriname, 0 otherwise	0.0177	
Sweden	1 if the survey was conducted in Sweden, 0 otherwise	0.0353	
Switzerland	1 if the survey was conducted in Switzerland, 0 otherwise	0.0384	
Taiwan	1 if the survey was conducted in Taiwan, 0 otherwise	0.0497	
United Kingdom	1 if the survey was conducted in United Kingdom, 0 otherwise	0.0290	
Venezuela	1 if the survey was conducted in Venezuela, 0 otherwise	0.0172	
Supervising other workers	1 if the respondent supervises other employees, 0 otherwise	0.2505	
Public servant	1 if the respondent works for a public employer, 0 otherwise	0.3303	
High income job	1 if respondent agrees or strongly agrees that has a high-income job, 0 otherwise	0.2854	
Secure job	1 if respondent agrees or strongly agrees that has a secure job, 0 otherwise	0.7204	
Job with high opportunities for advancement	1 if respondent agrees or strongly agrees that his job has high opportunities for advancement, 0 otherwise	0.2942	

(Continued)

Table 1. (Continued).

Variable	Description	Mean	S. Dev.
Received training to improve job skills	1 if the worker received training to improve skills over the last 12 months, 0 other.	0.4763	
Interesting job	1 if respondent agrees or strongly agrees that his job is interesting, 0 otherwise	0.7252	
Useful job to society	1 if respondent agrees or strongly agrees that his job is useful to society, 0 otherwise	0.9205	
Job can help other people	1 if respondent agrees or strongly agrees that in his job he can help other people, 0 otherwise	0.8914	
Job allows personal contact with other people	1 if respondent agrees or strongly agrees that his job has personal contact with other people, 0 otherwise	0.9553	
Can work independently	1 if respondent agrees or strongly agrees that can work independently in his job, 0 otherwise	0.7140	
Easy to take time off during working hours	1 if respondent considers that it is not too difficult or not difficult at all to take time off during working hours, 0 otherwise	0.6086	
Nonstressful work	1 if respondent hardly ever or never finds to have a stressful work, 0 otherwise	0.2186	
Hours worked weekly	Number of hours worked per week	37.085	8.921
Good relations between workmates or colleagues	1 if respondent considers that relations between workmates or colleagues are quite good or very good, 0 otherwise	0.8634	
Good relations between manag. and employees	1 if respondent considers that relations between management and employees are quite good or very good, 0 otherwise	0.7316	
Job does use of past work exper. and skills	1 if respondent considers that job does a lot or almost all use of past work experience and skills, 0 otherwise	0.6233	
Job demands do not interfere with family life	1 if respondent considers that job demands hardly ever or never interfere with the family life, 0 otherwise	0.5863	

1. This table describes some variables to be used as explanatory in the regression analysis and reports the corresponding sample mean and standard deviation; 2. Standard deviations were computed only for continuous variables; 3. For each binary variable the mean matches its sample proportion.

Table 2. Job satisfaction and organizational commitment description.

	%
Level of Job Satisfaction:	
1-Completely dissatisfied	1.7
2-Very dissatisfied	2.2
3-Dissatisfied	4.8
4-Neither satisfied nor dissatisfied	10.1
5-Satisfied	35.9
6-Very satisfied	30.2
7-Completely satisfied	14.7
Level of Organizational Commitment:	
<i>a) I am willing to work harder than I have to in order to help firm or organization for succeed</i>	
1-Strongly disagree	5.3
2-Disagree	12.8
3-Neither agree nor disagree	21.8
4-Agree	42.6
5-Strongly agree	17.5
<i>b) I am proud to be working for my firm or organization</i>	
1-Strongly disagree	2.6
2-Disagree	7.6
3-Neither agree nor disagree	23.2
4-Agree	45.7
5-Strongly agree	21.0
<i>c) I would turn down another job that offered quite a bit more pay in order to stay with this organization</i>	
1-Strongly disagree	16.1
2-Disagree	28.5
3-Neither agree nor disagree	23.3
4-Agree	20.0
5-Strongly agree	12.1

% indicates the percentage in the sample.

statements were reported on a five-point scale ranging from strongly disagree to strongly agree. These three items naturally correspond to our measures of organizational commitment to the extent that they capture workers' levels of involvement, affection, attachment, or dedication to the firm or organization.

3.3. The statistical model

The constructs to be explained in this paper are the level of job satisfaction and the level of organizational commitment. For the empirical analysis and following the conceptual framework previously described, the determinants of job satisfaction include both employee and job or workplace-related characteristics. These are also considered determinants of organizational commitment together with job satisfaction. For this purpose, we estimate separate equations for job satisfaction and organizational commitment: a common procedure in the literature.

Due to the ordinal nature of the dependent variables, a linear regression approach is not suitable. Instead, an ordered probit type model may be used. Another common alternative in the literature is to assume that the error term follows a logistic pattern, which yields the so-called ordered logit model (Greene, 2018).

Consider that the dependent variable (job satisfaction or organizational commitment) for respondent i is determined by the following stochastic process:

$$y_i^* = \beta x_i + \varepsilon_i \quad i = 1, \dots, N \quad (1)$$

where y_i^* is a latent variable, x_i is a set of explanatory variables, β is the vector of parameters to be estimated, and ε_i stands for a random term.

However, in the data, we do not observe y_i^* but an indicator variable y_i , which indicates the level of satisfaction or the level of organizational commitment, depending on the case under scrutiny, to which the respondent belongs, such that:

$$y_i = j \quad \text{if} \quad \mu_{j-1} < y_i^* \leq \mu_j \quad j = 1, \dots, J \quad (2)$$

The thresholds μ are unknown and cut the assumed distribution for the error term into segments, being that $\mu_{j-1} < \mu_j$. Assuming that the error terms, ε_i , are independent and follow a standard normal distribution, the probability that respondent i belongs to each alternative j is given by:

$$P(y_i = j) = \Phi(\mu_j - \beta' x_i) - \Phi(\mu_{j-1} - \beta' x_i) \quad \text{if} \quad j = 1, \dots, J \quad (3)$$

The log-likelihood function to be maximized is given by:

$$\text{Log}L = \sum_{i=1}^N \sum_{j=1}^J \lambda_{ij} \log \{ \Phi(\mu_j - \beta' x_i) - \Phi(\mu_{j-1} - \beta' x_i) \} \quad (4)$$

where

$$\begin{cases} \lambda_{ij} = 1 & \text{if } y_i = j \\ \lambda_{ij} = 0 & \text{if } y_i \neq j \end{cases} \quad i = 1, \dots, N \quad j = 1, \dots, J$$

Identification in this model is achieved by excluding the constant term and by fixing one of the μ_j (Stewart, 2004). Another alternative would be a simple normalization that keeps the constant term but fixes μ_1 equal to zero (Greene, 2018).

The ordered probit model, although widely used to examine ordinal data, depends on a strong assumption about the error term. Our estimation model uses, as a robust yet flexible alternative approach to the stringent assumption associated with the standard ordered probit model, a semi-nonparametric estimator of an unknown density, proposed by Gallant and Nychka (1987). This procedure can be written as the product of a squared polynomial and a normal density. It is noteworthy to mention that the resulting model nests the standard ordered probit model, thus allowing for hypothesis testing in order to choose the appropriate model.

The semi-nonparametric approach approximates the unknown density as:

$$f_K(\varepsilon) = \frac{\left(\sum_{k=0}^K \gamma_k \varepsilon^k\right)^2 \phi(\varepsilon)}{\int_{-\infty}^{\infty} \left(\sum_{k=0}^K \gamma_k \varepsilon^k\right)^2 \phi(\varepsilon) d\varepsilon} \quad (5)$$

The required distribution function is specified as:

$$F_K(\varepsilon) = \frac{\int_{-\infty}^{\varepsilon} \left(\sum_{k=0}^K \gamma_k \varepsilon^k\right)^2 \phi(\varepsilon) d\varepsilon}{\int_{-\infty}^{\infty} \left(\sum_{k=0}^K \gamma_k \varepsilon^k\right)^2 \phi(\varepsilon) d\varepsilon} \quad (6)$$

Equation (5) defines a family of semi-nonparametric distributions for increasing values of K , and the unknown density can be closely approximated by this Hermite series by increasing the choice of K – the degree of the polynomial –, provided that it satisfies certain smoothness conditions (Gallant & Nychka, 1987; Stewart, 2004). Following Gallant and Nychka (1987), the model parameters can be consistently estimated by maximizing a pseudo-likelihood function which replaces in Equation (4) the standard normal cumulative distribution by the one defined in (6).

The model requires a location normalization for identification. One way of doing this is to fix the first threshold (μ_1) to its ordered probit estimate by using (4), which closely resembles the procedure used by Melenberg and van Soest (1996) in the context of a probit model. It is also worth noting that when $K = 0$, $K = 1$, and $K = 2$, the model is equivalent to the conventional ordered probit model. The choice of K is part of the model selection procedure by testing between different alternatives. In this paper, model estimation and further testing rely on Stewart (2004).

Table 3. Job satisfaction: LRT tests for model choice.

K	Log-L	LR-test of OP	DF	p-value	LR-Test of K-1	DF	p-value
OP	-18088.0						
K = 3	-18044.4	87.15	1	0.000	87.15	1	0.000
K = 4	-17999.8	176.46	2	0.000	89.30	1	0.000
K = 5	-17999.0	178.02	3	0.000	1.56	1	0.211

1. This table reports two likelihood-ratio tests for model choice such as suggest by Stewart (2004): a) LR-test of OP which tests the standard ordered probit model (null hypothesis) against three semi-nonparametric alternatives for $K = 3$, $K = 4$, and $K = 5$ (in the $K = 1$ and $K = 2$ cases the model is equivalent to the standard ordered probit) and b) LR-test of K-1 which tests the alternative K-1 (null hypothesis) against the alternative K; 2. LR-test of OP is computed as $-2(\text{Log-L}_{OP} - \text{Log-L}_{K=j})$ with $j = 3, 4$, or 5 (degrees of freedom and the test p-values of a chi-square distribution are Columns 4 and 5, respectively); 3. LR-test of K-1 is computed as $-2(\text{Log-L}_{K-1} - \text{Log-L}_K)$ with $K = 3, 4, 5$ (degrees of freedom and the test p-values of a chi-square distribution are Columns 7 and 8, respectively); 4. K, Log-L, OP, and DF denote the order of the Hermite polynomial, the value of the Log-L function evaluated at the parameters estimated values, standard ordered probit model, and degrees of freedom, respectively.

4. Results and discussion

4.1. Results

We start by noting that likelihood-ratio tests, included in Table 3, regarding the explanation of job satisfaction for different values of K from 3 to 5 reject the standard ordered probit model against the semi-nonparametric alternative in all cases. Moreover, likelihood-ratio tests for K against $K-1$ reject the null hypothesis at significance levels of 10% or less for $K \leq 4$ but not for K above this limit, suggesting the selection of a $K = 4$ model.

Estimation results for the $K = 4$ semi-nonparametric ordered probit model are presented in Table 4, in which workers' reported level of job satisfaction is explained through two sets of employee and job-related characteristics. The null hypotheses that each of these sets of variables does not explain workers' job satisfaction are rejected at conventional significance levels using the likelihood-ratio tests included in Table 5. These results validate hypotheses H1 and H2.

However, it is worth noting that not all variables included in those sets have explanatory power, such is the case of individual characteristics like age, gender, and whether or not the employee is a union member (Table 4). Other attributes such as education, religious beliefs, and country of residence explain job satisfaction. For instance, as education increases, the likelihood of being completely satisfied decreases, and that of being completely dissatisfied increases. In terms of religious beliefs, Buddhists show the highest probability of being completely satisfied with their jobs.

Most interestingly, there are significant differences in job satisfaction by country. Out of 36 countries included in the regression and after controlling for the effect of a large number of other individual and job-related characteristics, Georgia and India occupy the two extremes. That is, the highest likelihood of being completely satisfied is found in India and is the lowest in Georgia, all else equal. Compared with the United States, which corresponds to the reference category in the regression, the probability of a worker being completely satisfied is higher, and the probability of being completely unsatisfied is lower, for countries such as India, Mexico, Venezuela, Spain, Russia, Israel, Croatia, Chile, Austria, and the Czech Republic. The reverse (i.e., the probability of being completely satisfied is lower and that of being completely unsatisfied is higher, as compared with the United States) is true in Georgia, Taiwan, China, Japan, Lithuania,

Table 4. The determinants of employees' job satisfaction.

	Coef.	S. Error	
1.Employee Characteristics			
Age	-0.0039	0.0044	
Age ² /100	0.0001	0.0001	
Female	0.0191	0.0187	
Years of education	-0.0021	0.0009	**
Living in steady partnership	0.0636	0.0204	***
Unionized worker	-0.0320	0.0242	
Catholic	0.0701	0.0290	**
Protestant	0.0653	0.0309	**
Orthodox	0.1018	0.0595	*
Other Christian religions	-0.0541	0.0474	
Jewish	-0.2228	0.1334	*
Islamic	0.1544	0.0685	**
Buddhist	0.2111	0.0806	***
Hindu	0.0524	0.1140	
Other Asian religions	0.1991	0.0888	**
Other religions	-0.0689	0.0972	
Attendance of religious services	0.0617	0.0321	*
Australia	-0.1875	0.0718	***
Austria	0.2461	0.0742	***
Belgium	0.0361	0.0614	
Chile	0.2477	0.0767	***
China	-0.3392	0.0850	***
Croatia	0.2706	0.0759	***
Czech Republic	0.1483	0.0685	**
Estonia	-0.0347	0.0698	
Finland	0.1113	0.0707	
France	-0.0068	0.0707	
Georgia	-0.5382	0.1178	***
Germany	-0.1776	0.0621	***
Hungary	-0.0281	0.0739	
Iceland	0.0290	0.0714	
India	0.7481	0.1444	***
Israel	0.2793	0.1291	**
Japan	-0.2662	0.0776	***
Latvia	-0.0653	0.0746	
Lithuania	-0.2314	0.0827	***
Mexico	0.5825	0.0876	***
New Zealand	-0.0936	0.0981	
Norway	-0.0201	0.0631	
Philippines	0.1285	0.0795	
Poland	0.0472	0.0802	
Russia	0.2801	0.0827	***
Slovak Republic	0.0350	0.0724	
Slovenia	-0.1633	0.0760	**
South Africa	0.0614	0.0698	
Spain	0.3421	0.0673	***
Suriname	-0.2016	0.0871	**
Sweden	-0.1976	0.0681	***
Switzerland	0.0708	0.0629	
Taiwan	-0.3906	0.0906	***
United Kingdom	0.0014	0.0705	
Venezuela	0.4452	0.0859	***
2.Job or Workplace Characteristics			
Supervising other workers	0.0348	0.0220	
Public servant	0.0702	0.0210	***
High income job	0.2660	0.0253	***
Secure job	0.2303	0.0239	***
Job with high opportunities for advancement	0.2395	0.0252	***
Received training to improve job skills	0.0800	0.0197	***
Interesting job	0.7409	0.0395	***

(Continued)

Table 4. (Continued).

	Coef.	S. Error	
Useful job to society	0.1692	0.0370	***
Job can help other people	0.1514	0.0331	***
Job allows personal contact with other people	0.1150	0.0452	**
Can work independently	0.1379	0.0234	***
Easy to take time off during working hours	0.1285	0.0202	***
Nonstressful work	0.2687	0.0256	***
Hours worked weekly	-0.0011	0.0011	
Good relations between workmates or colleagues	0.2575	0.0308	***
Good relations between management and employees	0.6294	0.0368	***
Job does use of past work experience and skills	0.1287	0.0206	***
Job demands do not interfere with family life	0.3238	0.0238	***
Thresholds:			
μ_1	-0.7807	Fixed	
μ_2	-0.1382	0.0514	***
μ_3	0.6368	0.0762	***
μ_4	1.4071	0.1039	***
μ_5	2.8463	0.1596	***
μ_6	4.0023	0.2069	***
Polynomial:			
1	0.0029	0.0089	***
2	-0.0980	0.0194	***
3	0.0054	0.0022	***
4	0.0169	0.0014	***
Log-L	-17999		
Wald chi-square (70)	546.1		
Number of observations	14437		

1. This table reports the estimates of a semi-nonparametric ordered probit model for job satisfaction (dependent variable) with $K = 4$; ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Table 5. Job satisfaction hypothesis testing.

Null hypotheses	LRT	DF	p-value
1. Employee characteristics do not influence job satisfaction, all else equal	654	52	0.0000
2. Job or workplace characteristics do not influence job satisfaction, all else equal	5585	18	0.0000

LRT, DF, and p-value denote the likelihood ratio test, degrees of freedom (equal to the number of restrictions imposed to the model), and the test p-value (for a chi-square distribution), respectively.

Suriname, Sweden, Australia, Germany, and Slovenia. There is no statistical difference in those probabilities between the United States and the remaining 15 countries used in the analysis, all else equal.

The heterogeneity in job satisfaction across countries is in some cases quite striking, such as the finding that Venezuelans had a higher probability of reporting (high) job satisfaction compared to Americans, while Germans had in turn a lower probability. There is no clear-cut explanation for these differences, but one can note that Germany is known as a strong labor market, while Venezuela has been experiencing an economic crisis. Consequently, it could be the case that due to the well-known dual vocational education and training system in Germany, once one starts a career in a specific field it is quite difficult to change careers. Moreover, increased unemployment experienced by Venezuelans during the time of the survey could make workers in Venezuela happy to have a job at all. In order to evaluate this argumentation, we included a new explanatory

variable based on the following 5-point scale ordinal question from the survey *How difficult or easy do you think it would be for you to find a job at least as good as your current one?*. This new variable assumes a value equal to 1 for responses of the type *very difficult* and *fairly difficult* and 0 in the other situations and undoubtedly captures the worker's perceptions of both macro-general and micro-idiosyncratic factors that impact his or her perceived desirability of his or her circumstances. However, including this variable as a regressor does not eliminate the existence of significant cross-county differences.

Job-and-workplace characteristics matter for employees' level of job satisfaction in most cases. The aspects of being a public servant, feeling of security in a job which brings a high income, having many opportunities for advancement, accessing training to improve skills, feeling interested in one's job, feeling useful to society, helping other people, and having the ease of taking time off during working hours positively impact reported job satisfaction. The same is valid for those who feel they have non-stressful work, good relations among workmates, good relations between management and employees, application of past experience and skills, and no interference with family life. Some of these attributes and, therefore, workers' level of job satisfaction can be controlled by management. In other words, managers have at their disposal some instruments that can be used in order to foster employees' satisfaction with the job.

The likelihood ratio tests included in Table 6 suggest the use of a $K = 4$ semi-nonparametric ordered probit model to explain employees' organizational commitment, whose estimation results are included in Table 7. Moreover, based on the information included in Table 8, the null hypothesis that workers' job satisfaction does not influence organizational commitment is rejected, thus supporting H3. The regression results predict that higher levels of job satisfaction imply higher levels of organizational commitment. However, a word of caution is worth since job satisfaction might be endogenous namely due to omitted variables that affect organizational commitment and are correlated with job satisfaction (Saridakis et al., 2018), which we address subsequently.

A commonly proposed technique for correcting the potential bias arising from such a problem is the use of instrumental variables (IV) techniques. This requires the existence of at least one observable variable which influences job satisfaction but does not affect

Table 6. Organizational commitment: LRT tests for model choice.

	Log-L	LR-Test of OP	DF	p-value	LR-Test of K-1	DF	p-value
<i>I am willing to work harder than I have to in order to help the firm or organization for succeed</i>							
OP	-17916.1						
K = 3	-17862.5	107.12	1	0.000	107.12	1	0.000
K = 4	-17824.0	184.27	2	0.000	77.15	1	0.000
K = 5	-17823.7	184.74	3	0.000	0.46	1	0.497
<i>I am proud to be working for my firm or organization</i>							
OP	-15078.5						
K = 3	-15010.5	135.94	1	0.000	135.94	1	0.000
K = 4	-14940.8	275.42	2	0.000	139.49	1	0.000
K = 5	-14940.8	275.43	3	0.000	0.01	1	0.938
<i>I would turn down another job that offered quite a bit more pay in order to stay with this organization</i>							
OP	-19394.5						
K = 3	-19374.8	39.52	1	0.000	39.52	1	0.000
K = 4	-19308.5	172.03	2	0.000	132.51	1	0.000
K = 5	-19307.8	173.47	3	0.000	1.45	1	0.229

See notes at the bottom of Table 3, which also apply to this table.

Table 7. The determinants of employees' organizational commitment.

	<i>Work harder in order to help the firm or organization for succeed.</i>			<i>Proud to be working for the firm or organization.</i>			<i>Turn down another job that offered quite a bit more pay to stay in the firm or organization.</i>		
	Coef.	S. Error		Coef.	S. Error		Coef.	S. Error	
1.Employee Characteristics:									
Age	0.0041	0.0048		0.0138	0.0043	***	0.0111	0.0043	***
Age ² /100	-0.0001	0.0001		-0.0001	0.0001	***	0.0000	0.0001	
Female	-0.0849	0.0196	***	0.0022	0.0170		-0.0189	0.0164	
Years of education	-0.0004	0.0009		-0.0011	0.0008		-0.0003	0.0008	
Living in steady partnership	0.0183	0.0199		0.0587	0.0183	***	0.0153	0.0179	
Unionized worker	-0.0689	0.0243	***	0.0260	0.0220		0.0263	0.0212	
Catholic	0.0798	0.0293	***	0.0712	0.0264	***	0.0240	0.0254	
Protestant	0.0375	0.0306		0.0734	0.0283	***	-0.0141	0.0269	
Orthodox	-0.0778	0.0570		0.0805	0.0532		-0.0460	0.0516	
Other Christian religions	0.0007	0.0469		0.1093	0.0435	**	0.0754	0.0420	*
Jewish	-0.2291	0.1256	*	0.0554	0.1125		-0.0722	0.1066	
Islamic	0.1016	0.0669		0.2213	0.0613	***	0.0251	0.0586	
Buddhist	-0.0400	0.0798		0.0963	0.0747		0.1466	0.0716	**
Hindu	0.5009	0.1199	***	0.2667	0.1034	***	0.1241	0.1006	
Other Asian religions	0.0611	0.0852		0.1705	0.0804	**	0.0447	0.0747	
Other religions	0.1061	0.0924		-0.0180	0.0841		-0.0300	0.0835	
Attendance of religious services	0.0201	0.0320		0.0648	0.0292	**	0.0819	0.0288	***
Australia	-0.4012	0.0751	***	-0.3194	0.0656	***	-0.0045	0.0616	
Austria	-0.6998	0.0893	***	-0.5266	0.0720	***	0.2398	0.0672	***
Belgium	-0.8982	0.0879	***	-0.3205	0.0576	***	0.1778	0.0540	***
Chile	-1.0765	0.1040	***	-0.6323	0.0714	***	0.0817	0.0643	
China	-0.1426	0.0812	*	-0.3091	0.0775	***	0.6040	0.0793	***
Croatia	-0.7129	0.0901	***	-0.3385	0.0688	***	0.0307	0.0642	
Czech Republic	-0.4934	0.0760	***	-0.5862	0.0663	***	0.4630	0.0645	***
Estonia	-0.8941	0.0916	***	-0.7392	0.0690	***	0.0887	0.0602	
Finland	-1.0019	0.1002	***	-0.5950	0.0691	***	0.4438	0.0672	***
France	-1.2416	0.1104	***	-0.2787	0.0661	***	0.0285	0.0622	
Georgia	0.0173	0.1133		-0.1824	0.1037	*	0.2403	0.1003	**
Germany	-0.8027	0.0828	***	-0.5789	0.0604	***	0.2818	0.0561	***
Hungary	-0.4875	0.0786	***	-0.3495	0.0674	***	0.0601	0.0641	
Iceland	-0.0289	0.0714		-0.0791	0.0656		-0.1615	0.0629	***
India	-0.3348	0.1372	**	-0.4549	0.1282	***	0.3549	0.1275	***
Israel	-0.1414	0.1220		-0.2211	0.1098	**	0.5507	0.1105	***
Japan	-0.3071	0.0787	***	-0.2565	0.0709	***	0.6795	0.0782	***
Latvia	-1.0476	0.1047	***	-0.4924	0.0702	***	0.5164	0.0712	***
Lithuania	-1.0255	0.1078	***	-0.7497	0.0789	***	0.3905	0.0771	***
Mexico	-0.2719	0.0871	***	-0.1625	0.0775	**	0.3003	0.0797	***
New Zealand	-0.1319	0.0964		-0.1243	0.0895		0.1655	0.0820	**
Norway	-0.3502	0.0666	***	-0.1772	0.0580	***	0.2635	0.0566	***
Philippines	-0.3433	0.0788	***	-0.3261	0.0724	***	0.5307	0.0754	***
Poland	-0.9971	0.1056	***	-0.6108	0.0768	***	0.1652	0.0708	**
Russia	-0.8942	0.1032	***	-0.8741	0.0821	***	0.3350	0.0744	***
Slovak Republic	-0.6141	0.0827	***	-0.5256	0.0679	***	0.2512	0.0633	***
Slovenia	-0.7299	0.0894	***	-0.2735	0.0693	***	0.1889	0.0666	***
South Africa	0.0616	0.0677		-0.1480	0.0633	**	0.2192	0.0618	***
Spain	-0.6312	0.0850	***	0.0345	0.0612		-0.0567	0.0622	
Suriname	-0.4209	0.0920	***	-0.1564	0.0776	**	0.5227	0.0858	***
Sweden	-0.6641	0.0827	***	-0.5185	0.0649	***	-0.0896	0.0605	
Switzerland	-0.4233	0.0698	***	-0.3586	0.0597	***	0.3468	0.0577	***
Taiwan	-0.1209	0.0853		-0.4728	0.0808	***	0.1659	0.0753	**
United Kingdom	-0.3073	0.0721	***	-0.3066	0.0644	***	0.1602	0.0606	***
Venezuela	0.4025	0.0923	***	0.3982	0.0837	***	0.1268	0.1158	
2.Job or Workplace Characteristics									
Supervising other workers	0.1893	0.0257	***	0.0962	0.0204	***	0.0861	0.0200	***

(Continued)

Table 7. (Continued).

	<i>Work harder in order to help the firm or organization for succeed.</i>			<i>Proud to be working for the firm or organization.</i>			<i>Turn down another job that offered quite a bit more pay to stay in the firm or organization.</i>		
	Coef.	S. Error		Coef.	S. Error		Coef.	S. Error	
Public servant	−0.0730	0.0208	***	0.0118	0.0189		−0.0199	0.0181	
High income job	0.0533	0.0222	**	0.0268	0.0202		0.0938	0.0201	***
Secure job	−0.0280	0.0210		0.0941	0.0197	***	0.0868	0.0194	***
Job with high opportunities for advancement	0.1140	0.0237	***	0.1607	0.0219	***	0.1329	0.0215	***
Received training to improve job skills	0.0884	0.0200	***	0.1145	0.0181	***	0.0137	0.0169	
Interesting job	0.1539	0.0256	***	0.3496	0.0265	***	0.1401	0.0230	***
Useful job to society	0.0369	0.0357		0.1602	0.0331	***	0.1155	0.0334	***
Job can help other people	0.0710	0.0323	**	0.1014	0.0296	***	0.1754	0.0313	***
Job allows personal contact with other people	0.0971	0.0447	**	0.0331	0.0406		0.0744	0.0412	*
Can work independently	0.1243	0.0236	***	0.0991	0.0208	***	0.0407	0.0200	**
Easy to take time off during working hours	0.1190	0.0207	***	0.0752	0.0181	***	0.0813	0.0181	***
Nonstressful work	−0.0310	0.0229		−0.0041	0.0210		0.0216	0.0203	
Hours worked weekly	0.0016	0.0011		−0.0006	0.0010		−0.0018	0.0009	*
Good relations between workmates or colleg.	−0.0063	0.0286		0.0031	0.0264		0.0552	0.0260	**
Good relations between manag. and employees	0.2772	0.0305	***	0.3432	0.0261	***	0.1747	0.0239	***
Job does use of past work exper. and skills	0.0524	0.0195	***	0.0356	0.0180	**	0.0310	0.0173	*
Job demands do not interfere with family life	0.0904	0.0200	***	−0.0151	0.0178		0.0075	0.0171	
3.Job satisfaction									
Very dissatisfied	0.3045	0.1291	**	0.5479	0.1161	***	0.7190	0.1215	***
Fairly dissatisfied	0.5518	0.1164	***	0.8523	0.1036	***	0.7480	0.1048	***
Neither satisfied nor dissatisfied	0.6530	0.1135	***	1.1206	0.1027	***	1.0872	0.1086	***
Fairly satisfied	0.8342	0.1185	***	1.4219	0.1071	***	1.3008	0.1136	***
Very satisfied	1.0407	0.1270	***	1.8337	0.1156	***	1.6521	0.1272	***
Completely satisfied	1.5128	0.1485	***	2.3296	0.1283	***	1.9538	0.1413	***
Thresholds:									
μ_1	−0.9924	Fixed		−0.0626	Fixed		1.3602	Fixed	***
μ_2	0.0278	0.0065	***	0.9205	0.0530	***	2.3099	0.0641	***
μ_3	0.8152	0.1293	***	2.0067	0.0942	***	2.9433	0.1027	***
μ_4	2.2040	0.2215	***	3.4561	0.1477	***	3.7003	0.1488	***
Polynomial:									
1	−0.1040	0.0774		−0.2179	0.0560	***	−0.1430	0.0692	**
2	−0.1400	0.0315	***	−0.1850	0.0197	***	−0.1987	0.0415	***
3	0.0063	0.0013	***	0.0289	0.0076	***	0.0076	0.0028	***
4	0.0237	0.0025	***	0.0259	0.0019	***	0.0289	0.0034	***
Log-L	−17824			−14940			−19308		
Wald chi-square (76)	272.5			759.3			358.2		
Number of observations	14437			14437			14437		

1. This table reports the estimates of three semi-nonparametric ordered probit models (one for each organizational commitment construct) with $K = 4$; 2. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

employee's organizational commitment. By inspection of the estimated results included in Tables 4 and 7, we conclude that having a non-stressful work exerts a (positive) direct impact in job satisfaction but does not directly explain organizational commitment. Indeed, ample support for this mediatory role of job satisfaction in the effect of

Table 8. Organizational commitment hypothesis testing.

1. Job satisfaction does not influence organizational commitment, all else equal	LRT	DF	p-value
1.1 <i>I am willing to work harder than I have ...</i>	778	6	0.0000
1.2 <i>I am proud to be working for firm or organization</i>	1632	6	0.0000
1.3 <i>I would turn down another job ...</i>	1048	6	0.0000
2. Employee characteristics do not directly influence organizational commitment, all else equal			
2.1 <i>I am willing to work harder than I have ...</i>	1721	52	0.0000
2.2 <i>I am proud to be working for firm or organization</i>	919	52	0.0000
2.3 <i>I would turn down another job ...</i>	799	52	0.0000
3. Job characteristics do not directly influence organizational commitment, all else equal			
3.1 <i>I am willing to work harder than I have ...</i>	710	18	0.0000
3.2 <i>I am proud to be working for firm or organization</i>	2141	18	0.0000
3.3 <i>I would turn down another job ...</i>	528	18	0.0000

See note at the bottom of Table 5, which also applies to this table.

occupational stress on organizational commitment has already been reported by Aghdasi et al. (2011).

In order to address the robustness of our previous results, the following two-step strategy has been implemented within our semi-nonparametric approach. From the coefficients of the estimated job satisfaction equation included in Table 4 which include a dummy for having a non-stressful work among the covariates, we calculated in a first step the corresponding predicted values for the job satisfaction index y_i^* (see Equation (1)). In a second step, we estimated a semi-nonparametric ordered probit ($K = 4$) for the organizational commitment constructs, which includes this predicted index among the covariates. Other explanatory variables included in the organizational commitment equations are the same as in Tables 8, except the work stress indicator which has been removed. The estimated coefficient associated with the satisfaction index is positive and significant at the 5% level for all the organizational commitment constructs, thus confirming that job satisfaction explains and exerts a positive effect on employee's organizational commitment. Estimated values for this coefficient across organizational commitment constructs are as follows: *I am willing to work harder than I have to in order to help firm or organization for succeed* (coef. = 0.0874, s.e. = 0.0383), *I am proud to be working for my firm or organization* (coef. = 0.2967, s.e. 0.0850) and *I would turn down another job that offered quite a bit more pay in order to stay with this organization* (coef. = 0.2502, s.e. 0.0971), where reported standard errors are robust and based on the Huber-White sandwich estimator of variance. In addition to this exercise, we also carried out further analysis by estimating a parametric ordered probit model for organizational commitment which treats job satisfaction as potentially endogenously determined and where the change in work stress is used once again as the instrument (performed by using the extended regression command *eoprobit* from the STATA statistical package). This approach implied a maximum likelihood joint estimation of two ordered probit models for job satisfaction and organizational commitment which allows for the correlation between the errors of these two equations. Such as before, the results indicated a positive and statistically significant role of job satisfaction to the determination of organizational commitment. Moreover, the null hypothesis of zero correlation between error terms of the two equations is not rejected at the 1% of significance across the three organizational

commitment constructs, being the estimated results as follows: *I am willing to work harder than I have to in order to help firm or organization for succeed* (corr. = 0.1227, s.e. = 0.3131), *I am proud to be working for my firm or organization* (corr. = 0.0621, s.e. 0.1073) and *I would turn down another job that offered quite a bit more pay in order to stay with this organization* (corr = -0.1272, s.e. 0.1704). Therefore, we cannot reject the hypothesis of exogeneity of job satisfaction in the organizational commitment equations. In sum, the previously reported positive impact of job satisfaction on organizational commitment is robust and not undermined by the endogeneity issues.

The null hypotheses that employee characteristics and job characteristics do not directly influence organizational commitment are rejected at conventional levels of significance, thus validating H4 and H5, respectively (Table 8). This implies that job and worker attributes do not determine organizational commitment only indirectly via their effect on job satisfaction, but also directly. In such a case, organizational commitment varies within each level of job satisfaction, depending on the values of those attributes. Nevertheless, some particularities can be isolated when examining the set as a whole and investigating the role of specific variables. Only a few cases will be mentioned below, although others can be easily identified within the estimated results included in Tables 4 and 7.

For instance, although gender has no visible effect on job satisfaction, it directly impacts the degree of agreement on the willingness to work harder in order to help the firm or organization succeed. In this case, women are less likely to strongly agree and more likely to strongly disagree, compared to men. However, gender has no visible effects on other organizational commitment indicators such as the pride of working for the firm or the willingness to turn down another job that offers quite a bit more pay in order to stay with the organization. The same is valid for union membership, whose coefficient is not statistically different from zero in the satisfaction equation. However, unionized workers are more unwilling to work harder in order to help the firm succeed than their non-unionized counterparts, but do not differ from these with respect to the pride of working for the firm or the willingness to stay in the job.

There are substantial heterogeneous outcomes regarding the impact of religious beliefs on organizational commitment. Hindus and Catholics are apparently more available to work harder to promote the success of the firm or organization. Hindus, Islamic, Protestants, and Catholics are more likely to be proud to work for a firm or organization. Buddhists are more probable to turn down another job in order to stay in the firm or organization. Years of completed education exert no direct effect on organizational commitment but only indirectly through their influence on job satisfaction.

There is also significant heterogeneity regarding the influence of country of residence on organizational commitment, which varies within a specific construct as well as across constructs (Table 9). Regarding the statement concerning their willingness to work harder in order to help a firm succeed, workers in Venezuela had the highest probability of strongly agreeing and the lowest probability of strongly disagreeing, all else equal, with the other extreme of the ranking occupied by France. The United States ranked fourth, although the difference was not statistically different from the second and the third (South Africa and Georgia, respectively). With respect to being proud of working for the firm or organization, Venezuela also led, while the other extreme of the ranking was found in Russia. In this case, the United States ranked third but was not statistically

Table 9. Regression coefficients ranking by country and Spearman rank correlation by organizational commitment constructs.

	Work harder in order to help the firm or organization for succeed.	Proud to be working for the firm or organization.	Turn down another job that offered quite a bit more pay to stay in the firm or organization.
1	Venezuela	Venezuela	Japan
2	South Africa	Spain	China
3	Georgia	United States	Israel
4	United States	Iceland	Philippines
5	Iceland	New Zealand	Suriname
6	Taiwan	South Africa	Latvia
7	New Zealand	Suriname	Czech Republic
8	Israel	Mexico	Finland
9	China	Norway	Lithuania
10	Mexico	Georgia	India
11	Japan	Israel	Switzerland
12	United Kingdom	Japan	Russia
13	India	Slovenia	Mexico
14	Philippines	France	Germany
15	Norway	United Kingdom	Norway
16	Australia	China	Slovak Republic
17	Suriname	Australia	Georgia
18	Switzerland	Belgium	Austria
19	Hungary	Philippines	South Africa
20	Czech Republic	Croatia	Slovenia
21	Slovak Republic	Hungary	Belgium
22	Spain	Switzerland	Taiwan
23	Sweden	India	New Zealand
24	Austria	Taiwan	Poland
25	Croatia	Latvia	United Kingdom
26	Slovenia	Sweden	Venezuela
27	Germany	Slovak Republic	Estonia
28	Estonia	Austria	Chile
29	Russia	Germany	Hungary
30	Belgium	Czech Republic	Croatia
31	Poland	Finland	France
32	Finland	Poland	United States
33	Lithuania	Chile	Australia
34	Latvia	Estonia	Spain
35	Chile	Lithuania	Sweden
36	France	Russia	Iceland
Work ...	-	0.606 ($p = 0.000$)	0.021 ($p = 0.902$)
Proud ...	-	-	0.004 ($p = 0.983$)

1. The first panel (rows numbered 1 to 36) of this table reports the ranking of the organizational commitment constructs regression coefficients from the most committed country (#1) to the least (# 36); 2. The second panel includes the Spearman rank correlation across organizational commitment constructs and the corresponding p-value test for the null hypothesis of zero correlation.

different from the second in the ranking (Spain), and France occupied a middle position. Despite some visible differences in these two rankings, such as the position of France, a Spearman rank correlation equals 0.606 ($P = 0.000$), indicating the positive significant association between them, therefore suggesting a proximity of type of organizational commitment captured by these two variables. However, substantial differences emerge when these rankings are compared with that of the willingness to turn down another job that offered quite a bit more pay in order to stay in the firm or organization. In this case, workers in Japan were the ones with the highest probability of strongly agreeing and the lowest probability of strongly disagreeing, followed by China, Israel, and the Philippines (Table 9). The other extreme is occupied by Iceland, and the United States ranks thirty-

second out of 36 countries. Employees in Venezuela, which occupied the top of the ranking in the former constructs, now occupy the twenty-sixth position. A Spearman rank correlation coefficient included at the bottom of Table 9 does not support any significant association between this ranking and the two previously examined. This finding suggests that the type of organizational commitment captured by this variable and the former ones are quite different, as it is likely closer to some sort of continuance commitment. Employees with high levels of continuance commitment remain in the organization because they need to stay until they find a more suitable opportunity elsewhere (Meyer & Allen, 1997).

4.2. Discussion

Job satisfaction, organizational commitment, and the relationship between them have been debated in several scientific areas. The present study contributes to this empirical literature by evaluating the determinants of these two constructs using a semi-nonparametric estimation of separate ordered probit models, with the benefit of not imposing *ex ante* stringent distributional assumptions regarding the error term. For this purpose, we consider a conceptual framework where job satisfaction may act as an antecedent of organizational commitment.

Empirical testing revealed interesting results. The results support our empirical estimation strategy, as the simple ordinary probit model – a specific case of our more general, more flexible non-parametric model – is rejected in favor of the general form we herein propose. Job satisfaction depends on certain employees' characteristics and job-related attributes, in line with the literature. Furthermore, job satisfaction significantly influences organizational commitment but does not fully explain such organizational commitment behavior. Finally, organizational commitment depends directly and indirectly (via job satisfaction) on employees and job-related attributes. These outcomes have several managerial implications.

It has been argued that organizational commitment contributes to business success, and our results indicate that management may foster organizational commitment to a certain extent. In fact, certain variables that directly and/or indirectly determine organizational commitment are not readily under the management's control, such as, and for instance, gender, religious beliefs and practices, public versus private sector work, country of residence. However, many instruments can be used by management in order to directly and/or indirectly enhance organizational commitment, including creating conditions to reduce stress in the workplace (due to its indirect impact on organizational commitment via job satisfaction) and promoting good relations between workmates and with management. Whenever possible, enabling an employee to take time off during working time and improving the coordination between job and family life also seems important in order to achieve that goal, which points to the role of flexible workplace arrangements and practices for individuals, teams, and organizations (Anderson et al., 2002; Scandura & Lankau, 1997). Recruiting workers with previous experience and skills to be used at work or providing training to improve workers' skills in order to avoid job-skill mismatch can help promote satisfaction and commitment. Other instruments relate to the development of practices that promote employees' positive feelings about job aspects such as pay, security, or autonomy and provide opportunities for job career

development. Our results are useful for managers to address perils of the Great Resignation of late 2021 and early 2022, with high number of resignations and high labour market tightness in labour markets such as the USA and associated potential for non-optimal job turnover and wage-growth induced inflation. In fact, the information herein uncovered may be used for managers to design human resource policies and practices that foster job satisfaction and organizational commitment, thus potentially avoiding excessive job turnover in a win-win manner for workers and organizations.

Finally, country-specific factors play a significant role in job satisfaction and organizational commitment. Indeed, job satisfaction varies substantially according to country of residence, after controlling for a large set of personal and job or workplace-related attributes. The same is true regarding organizational commitment. Moreover, the impact of country of residence on the explanation for the likelihood of *turning down another job that offered quite a bit more pay in order to stay at the firm* and the explanation for the other two organizational commitment constructs differs substantially. These results suggest that, despite the convergence in workplaces and workforces in many aspects due to globalization and the expanding role of multinationals, managers and human resources professionals alike must be aware that substantial differences still exist across countries (even after controlling for religious dimensions).

5. Conclusions and future research directions

This paper examined job satisfaction and organizational commitment using a sizeable, rich, micro data set for a large number of working respondents in 36 countries. Due to the ordered nature of the dependent variables, we estimate ordered probit equations using a semi-nonparametric approach, which revealed itself to be far superior to the conventional ordered probit model thus validating our proposed empirical strategy. The results indicate that employee and job-related attributes directly and indirectly (through job satisfaction) affect organizational commitment. However, within each of those sets, not all variables play the same role or are equally controllable for managerial purposes. Our empirical results do uncover a set of workplace-related variables which managers can leverage to significantly foster organizational commitment. A very interesting result is that despite the ubiquitous and inexorable globalization process, job satisfaction and organizational commitment differ significantly across countries, even after a large set of controls for individual and job-workplace related characteristics is considered. Managers ought to consider said micro determinants of job satisfaction and organizational commitment and cross-country differences to design well-informed human resources policies that aim to foster job satisfaction and organizational commitment, which could help address job resignations that contribute negatively to optimal job turnover; an economic problem acutely felt in certain labour markets experiencing the present day so-called Great Resignation.

The semi-nonparametric approach does not address some aspects which could be explored in future research, such as a potential reciprocity between the organizational commitment and job satisfaction, which could be relevant (Saridakis et al., 2018). Moreover, a replication of the methodology applied to different countries separately could add to the understanding of cross-country differences or similarities in the

determinants of job satisfaction and organizational commitment as well as the relationship between these two constructs.

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References

- Adams, J. S. (1963). Toward an understanding of inequity. *Journal of Abnormal and Social Psychology*, 67(5), 422–436. <https://doi.org/10.1037/h0040968>
- Aghdasi, S., Kiamanesh, A. R., & Ebrahim, A. N. (2011). Emotional intelligence and organizational commitment: Testing the mediatory role of occupational stress and job satisfaction. *Procedia – Social and Behavioral Sciences*, 29(1), 1965–1976.
- Akerlof, G., Rose, A., & Yellen, J. (1988). Job switching and job satisfaction in the US labor market. *Brookings Papers on Economic Activity*, 2, 495–582. <https://doi.org/10.2307/2534536>
- Allen, N. J., & Meyer, J. P. (1993). Organizational commitment: Evidence from career stage effects. *Journal of Business Research*, 26(1), 49–61. [https://doi.org/10.1016/0148-2963\(93\)90042-N](https://doi.org/10.1016/0148-2963(93)90042-N)
- Allen, J., & van der Velden, R. (2001). Educational mismatches versus skill mismatches: Effects on wages, job satisfaction and on-the-job search. *Oxford Economic Papers*, 53(3), 434–452. <https://doi.org/10.1093/oep/53.3.434>
- Amador, M. L. B., & Vila, L. E. (2013). Education and skill mismatches: Wage and job satisfaction consequences. *International Journal of Manpower*, 34(5), 416–428. <https://doi.org/10.1108/IJM-05-2013-0116>
- Anderson, S. E., Coffey, S. B., & Byerly, R. T. (2002). Formal organizational initiatives and informal workplace practices: Links to work-family conflict and job-related outcomes. *Journal of Management*, 28(6), 787–810. <https://doi.org/10.1177/014920630202800605>
- Artz, B., & Kaya, I. (2014). The impact of job security on job satisfaction in economic contractions versus expansions. *Applied Economics Economics*, 46(24), 2873–2890. <https://doi.org/10.1080/00036846.2014.914148>
- Azeem, S. M., & Akhtar, N. (2014). The influence of work life balance and job satisfaction on organizational commitment of healthcare employees. *International Journal of Human Resource Studies*, 4(2), 18–24. <https://doi.org/10.5296/ijhrs.v4i2.5667>
- Bateman, T. S., & Strasser, S. (1984). A longitudinal analysis of the antecedents of organizational commitment. *Academy of Management Journal*, 27(1), 95–112. <https://doi.org/10.2307/255959>
- Belfield, C., & Harris, R. (2002). How well do theories of job matching explain variation in job satisfaction across education levels? Evidence for U.K. graduates. *Applied Economics*, 34(5), 535–548. <https://doi.org/10.1080/00036840110041895>
- Borjas, G. F. (1979). Job satisfaction, wages and unions. *The Journal of Human Resources*, 14(1), 21–40. <https://doi.org/10.2307/145536>
- Borooah, V. K. (2009). Comparing levels of job satisfaction in the countries of Western and Eastern Europe. *International Journal of Manpower*, 30(4), 304–305. <https://doi.org/10.1108/01437720910973025>
- Bozionelos, N., & Kostopoulos, K. (2010). What accounts for job satisfaction differences across countries? *Academy of Management Perspectives*, 24(1), 82–84. <https://doi.org/10.5465/amp.24.1.82>
- Brown, S., McHardy, J., McNabb, R., & Taylor, K. (2011). Workplace performance, worker commitment and loyalty. *Journal of Economics & Management Strategy*, 20(3), 925–955. <https://doi.org/10.1111/j.1530-9134.2011.00306.x>
- Chan, S. H., & Qiu, H. H. (2011). Loneliness, job satisfaction, and organizational commitment of migrant workers: Empirical evidence from China. *The International Journal of Human Resource Management*, 22(5), 1109–1127. <https://doi.org/10.1080/09585192.2011.556785>
- Chaudhuri, K., Reilly, K. T., & Spencer, D. A. (2015). Job satisfaction, age and tenure: A generalized dynamic random effects model. *Economics Letters*, 130, 13–16. <https://doi.org/10.1016/j.econlet.2015.02.017>

- Clark, A. E. (1997). Job satisfaction and gender: Why are women so happy at work? *Labour Economics*, 4(4), 341–372. [https://doi.org/10.1016/S0927-5371\(97\)00010-9](https://doi.org/10.1016/S0927-5371(97)00010-9)
- Clark, A. (1998). Measures of Job Satisfaction: What makes a good job? Evidence from OECD countries. *OECD Labour Market and Social Policy Occasional Papers*, No. 34. OECD Publishing.
- Clark, A., & Oswald, A. (1996). Satisfaction and comparison income. *Journal of Public Economics*, 61(3), 359–381. [https://doi.org/10.1016/0047-2727\(95\)01564-7](https://doi.org/10.1016/0047-2727(95)01564-7)
- Clark, A. E., Oswald, A. J., & Warr, P. (1996). Is job satisfaction U-shaped in age? *Journal of Occupational and Organizational Psychology*, 69(1), 57–81. <https://doi.org/10.1111/j.2044-8325.1996.tb00600.x>
- Díaz-Serrano, L., & Vieira, J. (2005). Low pay, higher pay and job satisfaction within the European Union: Empirical evidence from fourteen countries. Discussion Paper No. 1558, Institute for the Study of Labor (IZA), Bonn.
- Elangovan, A. (2001). Causal ordering of stress, satisfaction and commitment, and intention to quit: A structural equations analysis. *Leadership & Organization Development Journal*, 22(4), 159–165. <https://doi.org/10.1108/01437730110395051>
- Farkas, A., & Tetrick, L. (1989). A three-wave longitudinal analysis of the causal ordering of satisfaction and commitment on turnover decisions. *The Journal of Applied Psychology*, 74(6), 855–868. <https://doi.org/10.1037/0021-9010.74.6.855>
- Frederici, R., & Skaalvik, E. (2012). Principal self-efficacy: Relations with burnout, job satisfaction and motivation to quit. *Social Psychology of Education*, 15(3), 295–320. <https://doi.org/10.1007/s11218-012-9183-5>
- Fulmer, I. S., & Ployhart, R. E. (2014). Our most important asset: A multidisciplinary/multilevel review of human capital valuation for research and practice. *Journal of Management*, 40(1), 161–192. <https://doi.org/10.1177/0149206313511271>
- Gallant, A. R., & Nychka, D. N. (1987). Semi-nonparametric maximum likelihood estimation. *Econometrica*, 55(2), 363–390. <https://doi.org/10.2307/1913241>
- García-Serrano, C. (2008). Job satisfaction, union membership and collective bargaining. *European Journal of Industrial Relations*, 15(1), 91–111. <https://doi.org/10.1177/0959680108100167>
- González, F., Sánchez, S. M., & López-Guzmán, T. (2016). The effect of educational level on job satisfaction and organizational commitment: A case study in hospitality. *International Journal of Hospitality & Tourism Administration*, 17(3), 243–259. <https://doi.org/10.1080/15256480.2016.1183547>
- Greene, W. H. (2018). *Econometric Analysis* (8th ed.). Pearson.
- Hackman, J. R., & Oldham, G. R. (1976). Motivation through the design of work: Test of a theory. *Organizational Behavior and Human Performance*, 16(2), 250–279. [https://doi.org/10.1016/0030-5073\(76\)90016-7](https://doi.org/10.1016/0030-5073(76)90016-7)
- Hammer, T. H., & Avgar, A. (2005). The impact of unions on job satisfaction, organizational commitment, and turnover. *Journal of Labor Research*, 26(2), 241–266. <https://doi.org/10.1007/s12122-005-1024-2>
- Harter, J. K., Schmidt, F. L., & Hayes, T. L. (2002). Business-unit-level relationship between employee satisfaction, employee engagement, and business outcomes: A meta-analysis. *The Journal of Applied Psychology*, 87(2), 268–279. <https://doi.org/10.1037/0021-9010.87.2.268>
- Hellman, C. M. (1997). Job satisfaction and intent to leave. *The Journal of Social Psychology*, 137(6), 677–689. <https://doi.org/10.1080/00224549709595491>
- Herzberg, F., Mausner, B., & Snyderman, B. (1959). *The motivation to work*. Wiley.
- Heywood, J., & Wei, X. (2006). Performance pay and job satisfaction. *Journal of Industrial Relations*, 48(4), 523–540. <https://doi.org/10.1177/0022185606066143>
- Huang, T. C., & Hsiao, W. J. (2007). The causal relationship between job satisfaction and organizational commitment. *Social Behavior and Personality: An International Journal*, 35(9), 1265–1276. <https://doi.org/10.2224/sbp.2007.35.9.1265>
- Idson, T. L. (1990). Establishment size, job satisfaction and the structure of work. *Applied Economics*, 22(8), 1007–1018. <https://doi.org/10.1080/00036849000000130>

- Johnson, G., & Johnson, W. (2002). Perceived over-qualification and dimensions of job satisfaction: A longitudinal analysis. *The Journal of Psychology*, 134(5), 537–555. <https://doi.org/10.1080/00223980009598235>
- Jones, R. J., & Sloane, P. J. (2009). Regional differences in job satisfaction. *Applied Economics*, 41(8), 1019–1041. <https://doi.org/10.1080/00036840601019067>
- Judge, T. A., Heller, D., & Mount, M. K. (2002). Five-factor model of personality and job satisfaction: A meta-analysis. *The Journal of Applied Psychology*, 87(3), 530–541. <https://doi.org/10.1037/0021-9010.87.3.530>
- Judge, T. A., & Hulin, C. L. (1993). Job satisfaction as a reflection of disposition: A multiple-source causal analysis. *Organizational Behavior and Human Decisions Processes*, 56(3), 388–421. <https://doi.org/10.1006/obhd.1993.1061>
- Judge, T. A., & Kammeyer-Mueller, J. D. (2012). Job attitudes. *Annual Review of Psychology*, 55(6), 1264–1294.
- King, J. E., & Williamson, O. I. (2005). Workplace religious expression, religiosity and job satisfaction: Clarifying a relationship. *Journal of Management Spirituality & Religion*, 2(2), 173–198. <https://doi.org/10.1080/14766080509518579>
- Koys, D. J. (2001). The effects of employee satisfaction, organizational citizenship behavior, and turnover on organizational effectiveness: A unit-level, longitudinal study. *Psychological Bulletin*, 54(1), 101–114. <https://doi.org/10.1111/j.1744-6570.2001.tb00087.x>
- Lance, C. E. (1991). Evaluation of a structural model relating job satisfaction, organizational commitment, and precursors to voluntary turnover. *Multivariate Behavioral Research*, 26(1), 137–162. https://doi.org/10.1207/s15327906mbr2601_7
- Linz, S. J. (2003). Job satisfaction among Russian workers. *International Journal of Manpower*, 24(6), 626–652. <https://doi.org/10.1108/01437720310496139>
- Locke, E. A. (1968). Toward a theory of task motivation and incentives. *Organizational Behavior and Human Performance*, 3(2), 157–189. [https://doi.org/10.1016/0030-5073\(68\)90004-4](https://doi.org/10.1016/0030-5073(68)90004-4)
- Maslow, A. H. (1943). A theory of human motivation. *Psychological Review*, 50(4), 370–396. <https://doi.org/10.1037/h0054346>
- Mathieu, J., & Zajac, D. (1990). A review and meta-analysis of the antecedents, correlates, and consequences of organizational commitment. *Psychological Bulletin*, 108(2), 171–194. <https://doi.org/10.1037/0033-2909.108.2.171>
- McClelland, D. C. (1961). *The achieving society*. Van Nostrand.
- McGregor, D. (1960). *The human side of the enterprise*. McGraw-Hill.
- Melenberg, B., & van Soest, A. (1996). Measuring the costs of children: Parametric and semiparametric estimators. *Statistica Neerlandica*, 50(1), 171–192. <https://doi.org/10.1111/j.1467-9574.1996.tb01486.x>
- Meyer, J. P., & Allen, N. (1991). A three-component conceptualization of organizational commitment. *Human Resource Management Review*, 1(1), 61–89. [https://doi.org/10.1016/1053-4822\(91\)90011-Z](https://doi.org/10.1016/1053-4822(91)90011-Z)
- Meyer, J. P., & Allen, N. J. (1997). *Commitment in the workplace: Theory, research and application*. Sage.
- Mowday, R. T., Steers, R., & Porter, L. (1979). The measurement of organizational commitment. *Journal of Vocational Behavior*, 14(2), 533–546. [https://doi.org/10.1016/0001-8791\(79\)90072-1](https://doi.org/10.1016/0001-8791(79)90072-1)
- Mysíková, M., & Večerník, J. (2013). Job satisfaction across Europe: Differences between and within regions. *Post-Communist Economies*, 25(4), 539–556. <https://doi.org/10.1080/14631377.2013.844934>
- Newstorm, D. (2007). *Organization behavior*. Tata McGraw-Hill Publishing.
- Paik, Y., Parboteeah, K. P., & Shim, W. (2007). The relationship between perceived compensation, organizational commitment and job satisfaction: The case of Mexican workers in the Korean Maquiladoras. *The International Journal of Human Resource Management*, 18(10), 1768–1781. <https://doi.org/10.1080/09585190701570940>
- Pouliakas, K., & Ioannis, T. (2010). Differences in the job satisfaction of high-paid and low-paid workers across Europe. *International Labour Review*, 149(1), 1–29. <https://doi.org/10.1111/j.1564-913X.2010.00073.x>

- Price, J. L. (1997). Handbook of organizational measurement. *International Journal of Manpower*, 18(4/5), 303–558. <https://doi.org/10.1108/01437729710182260>
- Rayton, B. A. (2006). Examining the interconnection of job satisfaction and organizational commitment: An application of the bivariate probit model. *The International Journal of Human Resource Management*, 17(1), 139–154. <https://doi.org/10.1080/09585190500366649>
- Renaud, S. (2002). Rethinking the union membership/job satisfaction relationship: Some empirical evidence in Canada. *International Journal of Manpower*, 23(2), 137–150. <https://doi.org/10.1108/01437720210428397>
- Ross, C. E., & Reskin, B. F. (1992). Education, control at work, and job satisfaction. *Social Science Research*, 21(2), 134–148. [https://doi.org/10.1016/0049-089X\(92\)90012-6](https://doi.org/10.1016/0049-089X(92)90012-6)
- Saner, T., & Eyüpoğlu, S. Z. (2012). The age and job satisfaction relationship in higher education. *Procedia - Social and Behavioral Sciences*, 55, 1020–1026. <https://doi.org/10.1016/j.sbspro.2012.09.593>
- Saner, T., & Eyüpoğlu, S. Z. (2013). The gender-marital status job satisfaction relationship of academics. *Procedia - Social and Behavioral Sciences*, 106, 2817–2821. <https://doi.org/10.1016/j.sbspro.2013.12.324>
- Saridakis, G., Lai, Y., Torres, R. I. M., & Gourlay, S. (2018). Exploring the relationship between job satisfaction and organizational commitment: An instrumental variable approach. *The International Journal of Human Resource Management*, 31(13), 1739–1769. <https://doi.org/10.1080/09585192.2017.1423100>
- Scandura, T., & Lankau, M. J. (1997). Relationships of gender, family responsibility and flexible work hours to organizational commitment and job satisfaction. *Journal of Organizational Behavior*, 18(4), 277–391. [https://doi.org/10.1002/\(SICI\)1099-1379\(199707\)18:4<377:AID-JOB807>3.0.CO;2-1](https://doi.org/10.1002/(SICI)1099-1379(199707)18:4<377:AID-JOB807>3.0.CO;2-1)
- Shields, M., & Price, S. (2002). Racial harassment, job satisfaction and intentions to quit: Evidence from the British nursing profession. *Economica*, 69(274), 295–362. <https://doi.org/10.1111/1468-0335.00284>
- Souza-Poza, A., & Souza-Poza, A. A. (2003). Gender differences in job satisfaction in Great Britain, 1991–2000: Permanent or transitory? *Applied Economics Letters*, 10(11), 691–694. <https://doi.org/10.1080/1350485032000133264>
- Spector, P. (1997). *Satisfaction: Application, assessment, causes and consequences*. Sage.
- Stewart, M. (2004). Semi-nonparametric estimation of extended ordered probit models. *The Stata Journal*, 4(1), 27–39. <https://doi.org/10.1177/1536867X0100400102>
- Suliman, A., & Lies, P. (2000). Is continuance commitment beneficial to organizations? Commitment performance relationship: A new look. *Journal of Managerial Psychology*, 15(5), 407–426. <https://doi.org/10.1108/02683940010337158>
- Top, M., Akdere, M., & Tarcan, M. (2015). Examining transformational leadership, job satisfaction, organizational commitment and organizational trust in Turkish hospitals: Public servants versus private sector employees. *The International Journal of Human Resource Management*, 26(9), 1259–1282. <https://doi.org/10.1080/09585192.2014.939987>
- Top, M., & Gider, O. (2013). Interaction of organizational commitment and job satisfaction of nurses and medical secretaries in Turkey. *The International Journal of Human Resource Management*, 24(3), 667–683. <https://doi.org/10.1080/09585192.2012.680600>
- Valaei, N., & Rezaei, S. (2016). Job satisfaction and organizational commitment. *Management Research Review*, 39(12), 1663–1694. <https://doi.org/10.1108/MRR-09-2015-0216>
- Vandenberg, R. J., & Lance, C. E. (1992). Examining the causal order of job satisfaction and organizational commitment. *Journal of Management*, 18(1), 153–167. <https://doi.org/10.1177/014920639201800110>
- van Saane, N., Sluiter, J. K., Verbeek, J. H., & Frings-Dresen, M. H. W. (2003). Reliability and validity of instruments measuring job satisfaction: A systematic review. *Occupational Medicine*, 5(3), 191–200. <https://doi.org/10.1093/occmed/kqg038>
- Vieira, J. A. (2005). Skill mismatches and job satisfaction. *Economics Letters*, 89(1), 39–47. <https://doi.org/10.1016/j.econlet.2005.05.009>

- Vila, L. E., & García-mora, B. (2005). Education and the determinants of job satisfaction. *Education Economics*, 13(4), 409–425. <https://doi.org/10.1080/09645290500251730>
- Vroom, V. H. (1964). *Work and motivation*. Wiley & Sons.
- Walton, R. E. (1985). From control to commitment in the workplace. *Harvard Business Review*, 63(2), 77–84.
- Wang, Y., Zheng, L., & Hu, T. (2014). Stress, burnout, and job satisfaction: Case of police force in China. *Public Personnel Management*, 43(3), 325–339. <https://doi.org/10.1177/0091026014535179>
- Westover, J., & Taylor, J. (2010). International differences in job satisfaction: The effects of public service motivation, rewards and work relations. *International Journal of Productivity and Performance Management*, 59(8), 811–828. <https://doi.org/10.1108/17410401011089481>
- Witt, L. A., & Neal, L. G. (1992). Gender and the relationship between perceived fairness of pay or promotion and job satisfaction. *The Journal of Applied Psychology*, 77(6), 910–917. <https://doi.org/10.1037/0021-9010.77.6.910>
- Wood, S., & Ogbonnaya, C. (2018). High-involvement management, economic recession, well-being, and organizational performance. *Journal of Management*, 44(8), 3070–3095. <https://doi.org/10.1177/0149206316659111>
- Yucel, I., & Bektas, C. (2012). Job satisfaction, organizational commitment and demographic characteristics among teachers in Turkey: Young is better? *Procedia – Social and Behavioral Sciences*, 46, 1598–1608. <https://doi.org/10.1016/j.sbspro.2012.05.346>