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An Exploration of the Relationship between High Performance Work Systems and Job Satisfaction

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Abstract

This paper contains an exploration of the relationship between high performance work systems (HPWSs) and employee wellbeing for workers from European countries. Specifically, the focus is on an examination of the level of involvement from firms using HPWSs in the different aspects of work organization. The results provided empirical evidence about the influence of factors like autonomy, flexibility, teamwork and skills, and workers' on-the-job satisfaction. The results indicated that higher levels of involvement in some HPWS practices increased the level of job satisfaction. In addition, estimates by age reveal interesting differences in the self-perception of job satisfaction.

Keywords: Organization of work, high performance organizations, job satisfaction, lean organization of work, incentives

JEL Classification codes: C35, J28, M12, M50

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In the last few decades, the nature of tasks and working conditions has changed radically. This process of change and the implications of such changes to human resource management have been widely discussed in academic literature. There is evidence that, in the last 20 to 30 years, globalization and increased competition have led to businesses restructuring their labor management practices in order to gain more flexibility and cooperation in the workplace (Appelbaum, Bailey, Berg, & Kalleberg, 2000; Boxall & Macky, 2009; Godard, 2000; Ichniowski, 2000; Macky & Boxall, 2008).

The combination of global competition and major developments in information technology has forced managers to rethink ways of organizing work. This rethinking has led to an increase in the adoption of so-called innovative, high performance, new, and flexible forms of work organization (Castells, 2010). The most important feature of these new ways of organizing work is a change from a Tayloristic form of organization, characterized by task specialization, a hierarchical pyramid structure, and centralization of responsibilities. This change is towards an organization with a flat hierarchy, job rotation, self-responsible teams, multitasking, greater involvement of lower level employees in decision making, and the replacement of vertical communication channels with horizontal channels (Appelbaum et al., 2000; Godard, 2010). The emergence and adoption of the so-called lean model or high performance work systems (HPWSs) is associated with this evolution.

Analysts often see dissemination of HPWS models as a particular dimension of a more general convergence in industrial relations systems among advanced, industrialized nations (Lorenz & Valeyre, 2005). They associate the positive effects of this set of management policies and practices with lower rates of employee

absenteeism, lower labor costs, and higher rates of productivity. Some authors identify HPWSs as a source of competitive advantage (Guthrie, Flood, Liu, & MacCurtain, 2009; Razouk, 2011).

A commitment to generating more and better jobs in Europe is a central element in recent EU strategies. The Lisbon and Barcelona strategies acknowledge the importance that this element has for companies being competitive in the European economy. Thus, new forms of work organization and high performance workplaces constitute an opportunity to achieve these goals (Eurofound, 2013; Eurofound, 2007; Flood, et al., 2008; UK Commission for Employment and Skills [UKCES], 2010). Eurofound (2013) examined the consequences of employee involvement, remarking on the positive effects these practices have on formal and informal learning opportunities, employee motivation, work and employment conditions, and employee wellbeing. This report concludes that, in general, higher levels of employees' commitment to their work tasks are conducive to good work performance and higher employee welfare. Nevertheless, employee involvement is only one of the multiple dimensions needed for implementing high performance work systems. In consequence, researchers need a more comprehensive analysis considering other High Performance Work Practices (HPWPs) to assess the effect of this system in Europe.

The main premise of the HPWS model is that firms can achieve greater flexibility, product quality, and performance while remaining competitive. Firms can also motivate employees to work harder through using their skills and information about their jobs to make more decisions and take on more responsibilities. Della Torre's (2012) recent survey study summarized theoretical and empirical contributions about the effect of these new work systems. As Della Torre pointed out, while empirical evidence suggests a positive relationship between HPWSs and business performance, the effect of the HPWS approach on employees' wellbeing remains controversial. Some empirical evidence suggested that HPWS models are systems that benefit workers in terms of increased performance, higher wages, and increased job satisfaction while reducing levels of absenteeism (Appelbaum et al., 2000; Batt, 2002; Barling, Kelloway, & Iverson, 2003; Capelli & Neumark, 2004; Harley, Allen, & Sargent, 2007; Guthrie et al., 2009; Macky & Boxall, 2008; Takeuchi, Chen, & Lepak, 2009; Wood & de Menezes, 2008). However, there is also empirical evidence arguing that HPWSs could simultaneously provide job satisfaction but increase levels of stress (Kashefi, 2009). This stress could increase the potential risk of conflicts because of the higher interdependency and pressure among colleagues working in teams (Askenazy & Caroli, 2010).

One of the problems that commonly arise in this literature is the lack of consensus about the type of human resource practices that constitute a HPWS (Boxall & Macky, 2009). Only more recently, Posthuma, Campion, Masimova, and Campion (2013) proposed a taxonomy for developing a clear and consistent use of HPWSs. Considering this taxonomy, this paper includes a set of six indexes, including some of the variables Posthuma et al. (2013) provided, to assess the influence of HPWS on job satisfaction. By doing that, this paper contributes to the literature by providing empirical evidence about the effect these practices have on a large sample of European countries. Part of this is comparing the effect of these variables on human resource practices among different groups of countries across Europe.

Using an international individual level dataset, the European Working Conditions Survey 2010 (EWCS 2010), this analysis adds new, relevant, empirical contributions to the literature. This highlights the fast changing environment for industrial relations in Europe and the potential changes because of incorporating new member states into the EU27. The information contained in this survey provides an opportunity to analyze and compare the implementation and effect of HPWSs in Europe. Eurofound (2013) remarked, "Analysis of the evidence from the EWCS strengthens the empirical basis for discussion between policy actors on the feasibility of and conditions for improving systems of work organization" (p. 9). Considering this, this paper includes the following research questions: Does HPWS influence job satisfaction positively? Are there differences for gender regarding perceived job satisfaction because of implementing HPWPs? Does the relationship between HPWS and job satisfaction change between different regions in the EU27? Does the relationship between HPWS and job satisfaction change among individuals with different levels of education?

Empirical Evidence

In the late 20th century and the first decade of the 21st century, industrialized nations developed new models for labor and work organization. In the last decade, researchers focused considerable attention on studying the adoption of HPWS models, the key factors that determine their adoption, and the effect of this work organization system on firms' performances (Arvanitis, 2005; Evans & Davis, 2005; Godard, 2000;

Razouk, 2011; Takeuchi, Lepak, Wang & Takeuchi, 2007). In the literature, researchers have documented well the sources and the determinants of job satisfaction amongst workers, both from the psychological and managerial perspectives. However, the discussion about the effect of the new models of work organization on the wellbeing of workers is still open.

Higher levels of worker participation may have significant influence on workers' wellbeing for several reasons. By increasing the control over their duties, workers might improve their satisfaction and wellbeing, feel that rewards from their tasks are greater, find more opportunities for social interaction, and feel positive stimulus towards work. In the extent that HPWS provides more importance to employees' voices in different dimensions, many advantages could arise. Böckerman, Bryson, and Ilmakunnas (2012) mentioned some of them:

> *Workers can instigate innovations in work practices which can reduce workers' exposure to risk of injury and diseases. Management can use the review of job tasks and work organisation accompanying the introduction of High Involvement Management (HIM) to "build in" better working conditions for workers resulting in improved physical wellbeing, irrespective of the degree of job autonomy those HIM practices offer workers. Also the training to so many HIM innovations can raise workers' competence thus reducing risks of accidents and injury. (p. 662)*

Most of the research on this subject analyzed the effects of HPWSs on wages and employment. Other studies analyze if the workplace systems have some effects on non-economic dimensions such as health conditions (Bauer, 2003; Wood & de Menezes, 2011). However, the results of these studies do not give a clear picture about the effects of HPWSs and their effects on job satisfaction.

Using data from Canadian organizations, Godard (2000) found that a moderate use of high performance organizational practices increased job satisfaction but that further increasing levels of high performance could have a negative influence. Kashefi (2009) confirmed this result and found that HPWSs simultaneously increased job satisfaction and job stress. Kashefi warns that increasing levels of job stress may eventually erode the value from higher job satisfaction and productivity associated with this strategy. Vidal (2007) analyzed whether the increase in front-line workers' responsibilities and abilities increased job satisfaction. He concluded that workers can be relatively satisfied under traditional Fordist arrangements and that increasing employee involvement does not necessarily increase satisfaction.

Researchers used different perspectives to analyze the determinants of job satisfaction. In order to analyze the effect of HPWSs on job satisfaction, some differences between the older and newer models of work organization need pointing out. An important difference between HPWSs and traditional Tayloristic organizational models is that HPWS models have a *holistic* perspective. A holistic point of view encourages organizations to provide non-managerial employees with the opportunity to participate in decision making, to work in self-managed teams, to enhance their skills through job rotation, and to give them more autonomy over the way they perform their tasks. In addition, there is a higher level of communication between co-workers and customers. Because of these changes, employers can assume that the new way of organizing will benefit employees and thus lead to increased job satisfaction.

Appelbaum et al. (2000) found that the opportunity to participate in decision making led to the creation of trust between employees and their supervisors. At the same time, workers experienced their jobs as challenging and intrinsically rewarding. Trust and intrinsic rewards related positively to high organizational commitment, high job satisfaction, and low work-related stress.

Studies supporting the positive influence of HPWSs on job satisfaction suggested that conditions and processes leading to good outcomes at work are also relevant. Benz and Frey (2008) pointed out that individuals preferred independence in decision making, autonomy, and relatedness, rather than being subjected to the traditional hierarchical decision making. Thus, since HPWSs decreased hierarchical levels and increased the possibilities of self-determination, it should have a direct, positive effect on job satisfaction.

In addition to the direct positive effects, there was also evidence of indirect positive effects of HPWSs on job satisfaction. These benefits included firms applying HPWSs paying higher wages and a reduction of workplace accidents. At the same time, recent studies analyzed variables like job satisfaction and the affective commitment of employees at firms using the HPWS model for high performance. Using Japanese data, Takeuchi et al. (2009) explained how the positive effects of HPWSs were because concerns for the employee climate mediated employee attitudes, such as job satisfaction and affective commitment. These authors reported that an organization's high-performance work system related negatively to organization-level absenteeism.

Researchers also analyzed the influence of flexible working times. Autonomy and flexibility during work time increased workers' abilities to coordinate their leisure time better with their family time, thus increasing job satisfaction. Studies that are more recent distinguished between functional and quantitative flexibility. Freeman and Kleiner (2000) concluded that employee involvement had positive effects on job satisfaction. More recently, Origo and Pagani (2008) found that functional flexibility, in general, but also specifically in the case of young workers, increased intrinsic and extrinsic job satisfaction. With respect to time or quantitative flexibility, Origo and Pagani (2008) found that workers were more interested in these schemes at the initial and final stages of their working lives. However, prime age workers were less concerned about flexibility. Time flexibility could lead to employees alternating short and long working days. At times, this would mean longer working hours, which could lead to an increased risk of workplace injuries.

Askenazy and Caroli (2010) also found that workers lost control over the pace of their work when working as part of a team, a common human resource practice associated with HPWSs. The constant pressure from colleagues on a worker increases the risk of conflicts amongst workers. The HPWS model encourages job rotation, which increases the responsibility level of employees for product quality but could in turn have a negative effect on safety. Job rotation and rapid model changes, both typical in flexible production routines, made it harder for workers to improve safety through work routines and learning though practice.

Data and Methodology

In order to study this subject, this research makes use of the fifth wave of the EWCS conducted in 2010. This survey provided a unique insight into the views of 43,246 workers in the EU27[1], a candidate country, and Turkey, as well as Croatia, Switzerland, Norway, former Yugoslav Republic of Macedonia (FYROM), and Montenegro. This covered a wide range of issues including work organization, working times, equal opportunities, training, health and safety, and job satisfaction.

EWCS's target population were all residents of these countries. The participants were aged 15 or older, but aged 16 or older in Spain, the UK, and Norway, and who were in employment as employees or self-employed in industry or service activities at the time of the survey. The survey provided information about respondents' occupations, levels of education, and the economic activities of the organizations employing them. The International Classification System for Occupation (ISCO-08), the General Industry Classification of Economic Activities within European Communities (NACE Rev. 2), and the International Standard Classification of Education, respectively, helped with coding this information. Therefore, data from EWCS helped analyze the forms of work organization and job satisfaction at the same time. The 2010 survey used the same methodology as it used previously, based on a questionnaire containing common questions, which allowed researchers to make meaningful comparisons between this survey and previous editions. In this paper, only countries pertaining to EU27 were considered.

Posthuma et al. (2013) expressed the need for identifying the set of human resource practices related to implementing HPWS and proposed a taxonomy of HPWPs that fitted with HPWS. Given that this study uses a cross-country database, this taxonomy was especially useful since it provides cross-cultural HPWPs applicable in different countries, which international empirical and conceptual literature analyzed previously. At the same time to cope with problems derived from the heterogeneity of countries included in the sample, this study uses the countries grouped together according to the groups proposed by the Eurofound (2013) report based on the EWCS (2010). These groups include continental, east central, east north, east south, Nordic, north western, southern, and Mediterranean islands[2].

This study follows the same basic assumption that Clark and Oswald (1996) made, namely that job satisfaction is an indicator of the employee's overall utility. In order to measure this variable, EWCS asked participants to self-assess job satisfaction in their main, paid jobs according to a Likert-type scale ranging from 0 to 3. With this, 0 indicates the minimum value for those employees responding as *not satisfied* and 3 indicates a maximum for those responding as *very satisfied*.

To start with, this study includes a database calculating four compounded indexes similar to those proposed in previous works (Bauer, 2004; Origo & Pagani, 2008)[3]. These indexes measure the extent to which an employee is involved in HPWS practices (see Figures 1 to 4).

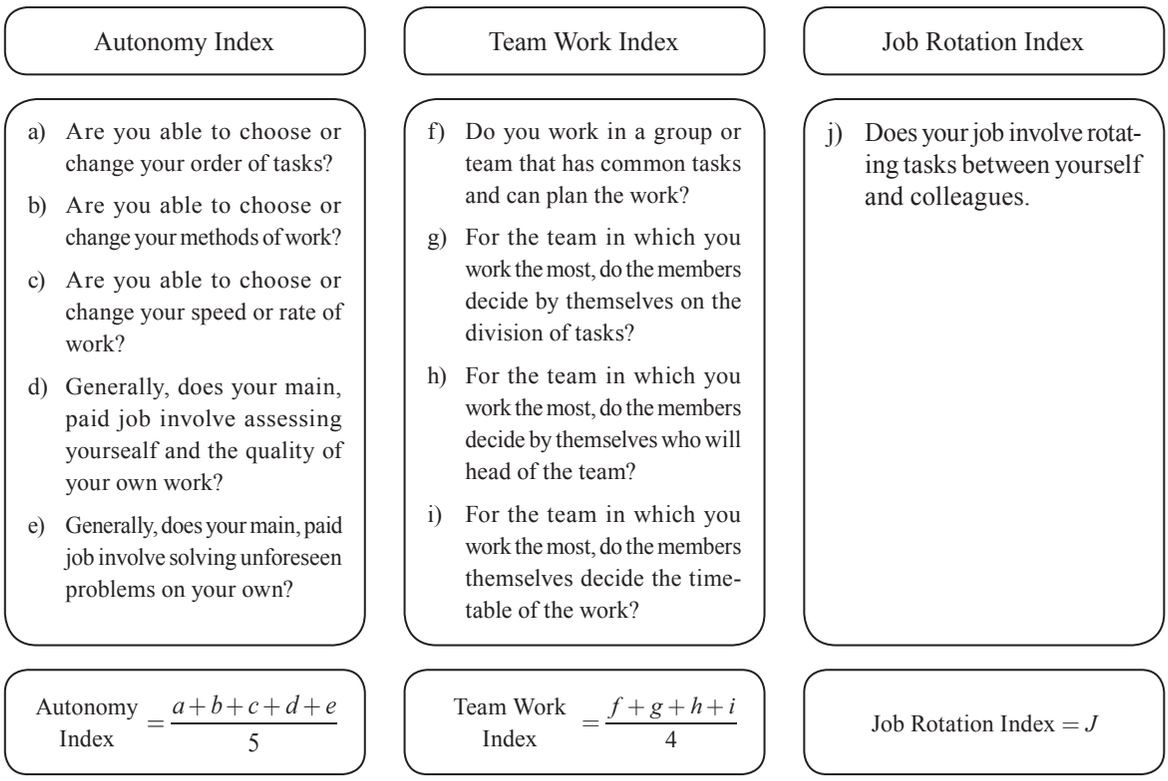

Figure 1. Work system index.

a) The autonomy index. The basis for an individual's autonomy index relates to the worker's responses regarding questions about the discretional ability to choose or change the order of tasks, the methods used at work, and the speed or rate at which employees may work. In addition, this index considers whether a worker assesses the quality of his or her own work and whether the job involves the worker solving unforeseen problems him or herself.

b) Team work index. The team work index component is a variable that indicates whether the worker participates in *self-managed team work.* Variables included in this index relate to whether the worker participates in a group where workers are encouraged to manage their own tasks and working practices. The codes to these questions' answers are 1 if the individuals answered *yes* and 0 if they answered *no.*

c) Job rotation index. The job rotation index describes whether the worker's job involves different tasks. As in the case of team work, the codes to these questions' answers are 1 if the individuals answered *yes* and 0 if they answered *no.*

d) Skill index. The skill index gives information about whether the organization gives support to the workers for fostering high performance organizational practices. This index includes questions about training the workers received from their organizations and whether the training involved learning new skills.

Skill Index

k) Over the past 12 months, have you undergone any of type of training to improve your skills? Was the training paid for or provided by your employer or by yourself if self-employed?

l) Over the past 12 months, have you undergone any of type of training to improve your skills or not? Was this on-the-job training?

m) Generally, does your main, paid job involve learning new things?

$$\text{Skill Index} = \frac{k + l + m}{3}$$

Figure 2. Skill index.

Employee Involvement

n) Are you consulted before targets for your work are set?

o) Are you involved in improving the work organisation or work processes of your department or organisation?

p) Do you have a say in the choice of your working partners?

q) Can you influence decisions that are important for your work?

$$\text{Employee Involvement} = \frac{n + o + p + q}{4}$$

Figure 3. Employee involvement index.

e) Employee involvement index. Based on Origo and Pagani's (2008) research, the index of employee involvement helps to capture the extent to which employees can influence targets, processes, the work of partners, and important decisions relating to their work.

f) Incentive Index. The incentive index provides information about whether the organization offers different payment systems to incentivize workers in order to encourage them to participate in HPWS practices.

Incentive Index

r) Regarding earnings from your main job, do they include piece rate or productivity payments?

s) Regarding earnings from your main job, do they include extra payments for additional hours of work or overtime?

t) Regarding earnings from your main job, do they include extra payments compensating for bad or dangerous working conditions?

u) Regarding earnings from your main job, do they include extra payments compensating for Sunday work?

v) Regarding earnings from your main job, do they include payments based on the overall performance of your company of employment?

w) Regarding earnings from your main job, do they include income from shares in the company of employment?

$$\text{Incentive Index} = \frac{r + s + t + u + v + w}{6}$$

Figure 4. Incentive index.

In addition to the above-mentioned indexes, this study includes some other variables. First, the *break* variable is about the possibility to take a break during the working hours. The *time arrangements* variable regards the employee's autonomy to set out his or her working hours. The *personal* variable is about the possibility to arrange one or two hours during a working day for personal matters. The *family* variable concerns whether working hours fit in with family or social commitments outside work. The *employability* variable is the ability to find another job of similar salary. The *motivation* variable is a variable that captures whether the firm motivates employees to do their best job performance. The *well-paid* variable indicates whether employees consider themselves as paid well for the job performed. The *career perspectives* variable indicates whether the current job position provides good prospects for career advancement. Finally, the *at home* dummy variable indicates if workers feel at home.

Table 1a and 1b show the distribution of average job satisfaction in comparison to the different indexes of HPWSs according to country groups. This study classifies groups of countries into blocks of countries following Eurofound's (2013) proposed groupings. These groups include continental, east central, east north, east south, Nordic, north western, southern, and Mediterranean islands.

Job satisfaction is especially high in Denmark, followed by the UK, Ireland, Austria, and Cyprus. In the lower extreme, Greece, Lithuania, Slovenia, Hungary, and Latvia had low job satisfaction. In respect to the six proposed HPWS indexes, Nordic countries, especially Denmark, had the highest scores. Particularly pronounced are the differences between Nordic countries and the rest of the groups in job rotation and work group indexes. In both cases, the second group ranks well below the Nordic averages; these figures are similar to those that Ferreira (2012) and Origo and Pagani (2008) indicated. North western countries, continental countries, and Cyprus and Malta show similar averages by group of countries. Netherlands, Southern and Eastern Europe in general, had the lowest scores, although internal variations are present, especially in Eastern Europe when comparing east, north, and east south. Eurofound (2013) explained that these differences result from the Nordic influence on north east countries. This is also consistent with figures from Bauer (2004), who analyzed the third wave of the EWCS 2000; Lorenz and Valeyre (2005); and, more recently, by Origo and Pagani (2008) who also analyzed another large-scale European survey, the 2001 Special Eurobarometer 56.1.

In respect to the rest of variables, Nordic countries also maintained the highest scores. Other countries like Netherlands, Poland, Estonia, Bulgaria, Spain, Italy, Cyprus, and Malta showed the highest scores in Continental, East Central, East North, East South, Southern, and Mediterranean Islands, respectively.

The indexes described above (Figures 1 to 4) are used to calculate the level of involvement of workers in HPWS practices. Once the indexes are calculated, an Ordered Probit Regression Model is estimated. The dependent variable of *job satisfaction* is a discrete, dependent variable reflecting an individual's perception of job satisfaction. The participants form each potential answer by selecting mutually exclusive alternatives, providing the framework of a multiple regression model of discrete choice. Researchers in the social sciences use this type of model extensively when analyzing variables needing qualitative responses. In particular, previous studies analyzing the effect HPWPs have on job satisfaction or wellbeing used similar methodologies (see, among others, Bauer, 2004; Böckerman et al., 2012, Origo & Pagani, 2008; Razouk, 2011). The values of the variable *job satisfaction* reflected different categories and the numerical values do not have a quantitative meaning but indicate an order of categories. Therefore, the natural, strategic approach is estimating the Ordered Probit Model that is a generalization of the Probit Model in the instance of more than two outcomes of an ordinal dependent variable.

Table 1a
High Performance Work Systems Indicators. Descriptive Statistics by Country

	Job satisfaction	Autonomy index	Team work index	Job rotation index	Skill index	Employee involvement	Incentive index	Break	Personal	Family	Employability	Motivation	Wellpaid	Career perspectives	Feel at home
Continental															
Belgium	3.19	0.75	0.40	0.47	0.47	0.41	0.08	3.02	2.84	3.19	2.97	3.79	3.44	3.01	4.03
Germany	3.13	0.70	0.40	0.55	0.44	0.31	0.07	2.98	2.39	3.06	2.48	3.55	3.19	2.57	3.74
France	2.98	0.69	0.39	0.35	0.37	0.38	0.12	3.33	2.65	3.06	2.98	3.43	2.74	2.61	3.74
Luxembourg	3.10	0.76	0.47	0.36	0.46	0.45	0.09	3.35	2.89	3.13	2.76	3.73	3.49	3.12	3.98
Netherlands	3.18	0.80	0.43	0.61	0.55	0.55	0.09	3.41	3.38	3.25	2.94	3.71	3.36	2.69	4.05
Austria	3.24	0.73	0.38	0.53	0.50	0.38	0.05	3.11	2.96	3.31	2.67	3.62	3.35	2.57	3.72
East Central															
Republic	2.91	0.71	0.38	0.35	0.46	0.42	0.10	3.06	2.27	3.05	2.64	3.26	3.03	2.69	3.47
Hungary	2.77	0.73	0.33	0.28	0.37	0.40	0.06	3.18	2.92	2.95	1.91	3.54	2.31	2.33	3.86
Poland	2.99	0.71	0.37	0.28	0.39	0.38	0.10	3.34	2.83	3.06	2.88	3.53	3.05	2.87	3.57
Slovenia	2.77	0.71	0.41	0.74	0.57	0.46	0.13	2.82	2.68	2.87	2.72	3.44	2.75	2.69	3.54
Slovakia	2.90	0.66	0.36	0.38	0.50	0.32	0.20	2.99	2.53	3.03	2.34	3.43	2.84	2.47	3.47
East North															
Estonia	2.87	0.77	0.40	0.45	0.48	0.48	0.09	3.27	2.73	3.05	2.31	3.49	2.70	2.43	3.62
Latvia	2.83	0.74	0.36	0.40	0.43	0.51	0.07	3.38	2.88	2.91	2.04	3.32	2.52	2.52	3.69
Lithuania	2.76	0.66	0.41	0.37	0.32	0.33	0.09	2.91	2.65	2.88	2.27	3.08	2.65	2.42	3.04
East South															
Bulgaria	2.87	0.58	0.28	0.51	0.28	0.36	0.06	2.94	2.88	3.01	2.25	3.67	2.77	2.62	3.72
Romania	2.88	0.68	0.44	0.37	0.34	0.45	0.05	3.49	3.00	3.11	2.11	3.35	2.78	2.40	3.68

Table 1b
High Performance Work Systems Indicators. Descriptive Statistics by Country

	Job satisfaction	Autonomy index	Team work index	Job rotation index	Skill index	Employee involvement	Incentive index	Break	Personal	Family	Employability	Motivation	Wellpaid	Career perspectives	Feel at home
Nordic															
Denmark	3.46	0.85	0.60	0.75	0.60	0.58	0.10	3.60	3.41	3.52	3.07	4.03	3.58	3.07	4.33
Finland	3.08	0.79	0.60	0.53	0.66	0.53	0.14	3.53	3.10	3.18	3.07	3.80	2.88	2.82	4.04
Sweden	3.14	0.77	0.61	0.51	0.63	0.53	0.10	3.55	3.44	3.27	3.03	3.88	3.10	2.72	4.14
North West															
Ireland	3.25	0.69	0.49	0.54	0.50	0.49	0.04	3.22	3.11	3.27	2.15	3.74	3.21	2.98	3.98
UK	3.31	0.73	0.41	0.49	0.54	0.45	0.06	3.15	3.04	3.34	2.95	3.76	3.24	3.04	4.06
Southern															
Greece	2.70	0.68	0.29	0.38	0.25	0.40	0.04	3.46	2.77	2.74	2.32	3.65	2.87	2.59	3.74
Spain	3.00	0.68	0.32	0.33	0.39	0.37	0.07	3.12	2.88	2.95	2.53	3.53	3.14	2.66	3.59
Italy	2.98	0.75	0.33	0.29	0.36	0.37	0.13	3.34	2.93	2.87	2.65	3.48	2.88	2.60	3.59
Portugal	2.97	0.71	0.20	0.28	0.36	0.37	0.05	3.55	3.03	2.93	2.14	3.83	2.70	2.64	3.97
Mediterranean Island															
Cyprus	3.24	0.66	0.23	0.39	0.39	0.43	0.02	3.24	3.08	3.19	2.22	3.97	3.48	2.89	3.99
Malta	3.15	0.87	0.45	0.43	0.44	0.51	0.06	3.14	3.09	3.11	2.66	3.79	3.19	3.04	4.04

The variable of interest U takes the H response uh, where $h = 1,\ldots,$ H is ordered as follows:

$$u_1 < u_2 < \ldots < u_H$$

The variable u_i^*, for the n-th individual, is determined according the following equation:

$$u_i^* = x_i'\beta + \lambda\varepsilon_i + \tau_i$$

Here x_i represents a vector of explanatory variables and λ, ε_i y, and τ_i represent a load factor, a heterogeneity term, and the random error, respectively. This substitutes a constant term for the thresholds that show the change of categories from one to another of the observed responses:

$$U_i \begin{cases} 1 & if \; -\infty < u_i^* < k_1 \\ 2 & if \quad k_1 < u_i^* < k_2 \\ 3 & if \quad k_2 < u_i^* < k_3 \\ 4 & if \quad k_3 < u_i^* < \infty \end{cases}$$

Here $k_{s,}$ S = 1,…, H-1 represents the corresponding parameter for each threshold. This shows the levels of job satisfaction workers declared.

Given that the EWCS provides a rich database with a large amount of information about workers, firms, and job characteristics, this research includes a large set of control variables (see appendix Table A1). This helps in order to take into account the potential source of endogeneity pointed out recently in some literature (Origo & Pagani, 2008). In this respect, one can assume that the use of a large amount of information would mitigate unobservable variables.

Results

In order to explore the presence of heterogeneity in the broad populations composing the sample, this research includes different subsamples in estimations. Table 2 shows the results of the ordered Probit estimation for different groups of countries in EU27 and the total sample. The estimations included several economic, demographic, occupational, and personal related variables to control the potential factors influencing job satisfaction. These results showed that the rotation index, incentive index, involvement index, and skill index were statistically significant. The rotation index measured if workers rotated tasks with other colleagues, negatively influencing job satisfaction. Counter intuitively, incentive index also exhibited a negative sign. Although it seems contradictory at first sight, it reflects that economic incentives could have a strong correspondence with a higher level of responsibilities or duties that coincided neither with the impression of being well paid nor with higher levels of satisfaction. Actually, the positive sign of the variable well paid would support this fact.

Involvement index, which captures the level of influence employees' voices have in their work, had a positive effect on job satisfaction. This is consistent with previous literature pointing out the influence of these types of practices (Eurofound, 2013; Origo & Pagani, 2008). These results, however, do not provide enough evidence to affirm that HPWS effected the employees' wellbeing positively.

Variables related with the flexibility that employees enjoy during their work hours had a positive influence on the level of job satisfaction. These variables included aspects such as time to take care of personal or family matters during working hours, work-life balance, and autonomy to take a break. Flexible working time allows workers to accommodate family and work responsibilities to solve personal problems, providing workers time and space to combine personal and labor dimensions. In a similar manner, variables related to the workers' wellbeing, including motivation and feeling at home, were positive and significant in the analyzed regions. Finally, the self-perceptions of having a positive career perspective and the companies paying well were also positive influences.

Table 2
Ordered Probit Model. Estimates by regions

Job satisfaction	Continental	East Central	East North	East South	Nordic	North W.	Southern	Med. Isl.	Total
Autoindex	0.09	-0.22	-0.05	0.26	-0.07	-0.06	-0.10	0.19	-0.01
	-0.09	-0.13	-0.20	-0.21	-0.19	-0.21	-0.17	-0.26	-0.05
Wgroupindex	0.09	0.01	-0.04	0.01	0.15	-0.01	-0.01	0.02	0.05
	-0.07	-0.09	-0.13	-0.17	-0.11	-0.14	-0.14	-0.19	-0.04
Rotaindex	-0.08	-0.04	-0.02	-0.29*	0.00	0.21	-0.21*	-0.21	-0.06*
	-0.05	-0.07	-0.09	-0.13	-0.08	-0.12	-0.09	-0.13	-0.03
Skillindex	-0.05	0.02	0.04	-0.15	0.19	0.08	0.05	0.24	0.03
	-0.07	-0.10	-0.16	-0.21	-0.13	-0.17	-0.14	-0.22	-0.04
Involveindex	0.49***	0.40***	0.33*	0.24	0.36**	0.22	0.30	-0.12	0.35***
	-0.08	-0.12	-0.16	-0.23	-0.13	-0.20	-0.16	-0.25	-0.05
Incentiveindex	-0.05	-0.31*	0.05	0.09	-0.14	0.34	0.08	-0.15	-0.15*
	-0.13	-0.16	-0.26	-0.43	-0.18	-0.36	-0.24	-0.51	-0.07
Break	0.03	0.01	0.02	-0.04	-0.02	0.01	0.09**	-0.03	0.02
	-0.02	-0.03	-0.04	-0.05	-0.03	-0.04	-0.04	-0.05	-0.01
Personal	0.07**	0.03	0.06	0.15*	0.05	0.22***	0.09	0.07	0.07***
	-0.02	-0.03	-0.05	-0.06	-0.04	-0.06	-0.05	-0.07	-0.01
Work.life balance	0.23***	0.31***	0.25***	0.30***	0.29***	0.32***	0.27***	0.22**	0.27***
	-0.03	-0.05	-0.07	-0.09	-0.06	-0.08	-0.06	-0.09	-0.02
Employability	0.02	0.03	-0.07	-0.02	0.05	0.07	-0.02	0.02	0.02
	-0.02	-0.03	-0.04	-0.05	-0.03	-0.04	-0.04	-0.05	-0.01
Motivation	0.23***	0.18***	0.22***	0.24***	0.39***	0.35***	0.35***	0.07	0.25***
	-0.03	-0.03	-0.05	-0.07	-0.05	-0.06	-0.05	-0.08	-0.02
Wellpaid	0.23***	0.34***	0.33***	0.28***	0.15***	0.27***	0.25***	0.20***	0.24***
	-0.02	-0.04	-0.05	-0.06	-0.03	-0.05	-0.05	-0.06	-0.01
Career perspectives	0.08***	0.154***	0.13**	0.136*	0.08*	-0.01	0.16***	0.162**	0.09***
	-0.02	-0.04	-0.05	-0.06	-0.04	-0.05	-0.04	-0.06	-0.01
Athome	0.41***	0.27***	0.27***	0.28***	0.25***	0.37***	0.24***	0.57***	0.32***
	-0.03	-0.04	-0.05	-0.08	-0.05	-0.07	-0.05	-0.08	-0.02
cut1									
Constant	0.63	1.17	1.91	2.44	1.42	2.34	-2.720*	0.09	0.56
	-0.64	-0.83	-2.09	-1.89	-0.92	-1.48	-1.32	-1.89	-0.39
cut2									
Constant	2.10***	2.50**	3.92	3.94*	2.75**	3.70*	-1.02	1.33	2.00***
	-0.64	-0.83	-2.09	-1.89	-0.92	-1.48	-1.32	-1.88	-0.39
cut3									
Constant	4.57***	5.15***	6.23**	6.37***	5.13***	6.14***	1.29	3.36	4.35***
	-0.64	-0.84	-2.10	-1.91	-0.93	-1.49	-1.31	-1.89	-0.39
N	3220.00	1702.00	799.00	505.00	1325.00	681.00	882.00	413.00	9527.00

Note. Includes socioeconomics and country variables as controls. Standard errors in parentheses:
* $p < .10$, ** $p < .05$, *** $p < .01$.

In order to analyze the influence of practices associated with HPWS, the research included estimations by region, gender, age, and education. By region, the results confirmed the negative influence of rotation index in east south and in southern countries. The involvement index had a positive influence on job satisfaction in continental, east central, east north, and Nordic countries. Incentive index is negative and significant only in east central countries. The variable of break was significant only in southern countries and had a positive influence on the level of job satisfaction. Time to arrange personal and family affairs was significant in continental, east south, and north west countries. Finally, the variable of work-life balance was positive and significant in all regions. This suggests that employees were more satisfied having jobs that could fit with family and personal commitments rather than flexibility to take time during their working hours in a punctual moment of their working day. In respect to variables related to working conditions, motivation, well paid career perspectives, and feeling at home, all the four variables reported significant and positive influences on job satisfaction, in almost all the cases. This confirms the strong influence of these dimensions on the employees' satisfaction with independence in the region considered.

Table 3 shows estimates based on gender. Results confirmed the importance of the involvement index on job satisfaction for both males and females. The ability to take one or two hours during working hours was significant for male workers but not for female workers, while work-life balance had a positive and significant influence in both cases. Employability was significant for females but not in the case of males. Motivation to give their best job performance, perception that the companies pay in correspondence to the work achieved, career perspectives, and the feeling of being at home increase the likelihood of higher levels of satisfaction. In general, there were no significant differences based on gender in respect to the variables influencing job satisfaction.

Because of findings in the results of previous studies about the perception of job satisfaction depending on age, this study includes running estimations for different age groups (Della Torre, 2012; Origo & Pagani, 2008). Table 4 shows interesting differences with respect to the estimation of age. Autonomy index, time to take care of personal and family matters, and the time to arrange breaks did not seem to reveal a specific pattern of preferences for the different age groups.

However, the results for the other indices produced some interesting facts. For example, the involvement index, a feature that acknowledges the seniority of more experienced workers, was important to older workers. In contrast, workers between 30-49 years seemed to be more concerned about their career prospects. This variable was not significant for younger and older workers, namely those who were in advanced stages of their careers.

Table 3
Estimates by Gender

	Female	Male
Autonomy index	0.02	0.18
	(0.11)	(0.12)
Team work index	0.02	0.08
	(0.08)	(0.08)
Job rotation index	-0.03	-0.02
	(0.06)	(0.06)
Skill index	0.03	0.02
	(0.09)	(0.09)
Employee involvement	0.33**	0.33**
	(0.11)	(0.11)
Incentive index	-0.05	-0.02
	(0.17)	(0.14)
Break	0.04	0.03
	(0.02)	(0.02)
Time arrangement	0.007	0.08*
	(0.03)	(0.03)
Work.Life balance	0.31***	0.31***
	(0.04)	(0.04)
Employability	0.05*	0.004
	(0.02)	(0.02)
Motivation	0.23***	0.33***
	(0.03)	(0.03)
Well paid	0.25***	0.22***
	(0.03)	(0.03)
Career perspectives	0.10***	0.01**
	(0.03)	(0.03)
Feel at home	0.33***	0.33***
	(0.04)	(0.04)
cut1 Constant	1.02	-0.62
	(0.74)	(0.73)
cut2 Constant	2.48***	0.80
	(0.74)	(0.73)
cut3 Constant	4.86***	3.33***
	(0.75)	(0.73)
N. Obs.	4913	4614

Note. Includes socioeconomics and country variables as controls. Standard errors in parentheses: * $p < .10$, ** $p < .05$, *** $p < .01$.

Other variables like motivation, work-life balance, and the perception that payment is fair also had positive and significant effects. Finally, career perspectives and the feeling of being at home in the organization increased the probability that the workers will be very satisfied, irrespective of their ages.

Table 4
Estimates by Range of Ages

	15-29	30-39	40-49	50+
Autonomy index	0.04	0.56**	0.13	-0.16
	(0.18)	(0.17)	(0.16)	(0.17)
Team work index	0.06	0.10	0.008	-0.09
	(0.14)	(0.13)	(0.12)	(0.12)
Job rotation index	-0.11	0.027	0.09	0.03
	(0.10)	(0.09)	(0.09)	(0.09)
Skill index	0.09	0.10	0.07	0.07
	(0.14)	(0.13)	(0.14)	(0.14)
Employee involvement	0.26	0.22	0.25	0.64***
	(0.19)	(0.15)	(0.15)	(0.15)
Incentive index	-0.03	0.08	-0.46*	-0.10
	(0.27)	(0.23)	(0.21)	(0.23)
Break	0.05	0.016	0.09**	-0.04
	(0.04)	(0.04)	(0.03)	(0.03)
Time arrangement	0.06	0.15**	0.03	0.05
	(0.05)	(0.05)	(0.04)	(0.05)
Work.Life balance	0.33***	0.25***	0.39***	0.33***
	(0.07)	(0.06)	(0.06)	(0.07)
Employability	0.02	0.03	0.05	-0.002
	(0.04)	(0.04)	(0.03)	(0.04)
Motivation	0.30***	0.25***	0.26***	0.26***
	(0.06)	(0.05)	(0.05)	(0.06)
Well paid	0.27***	0.24***	0.21***	0.23***
	(0.05)	(0.05)	(0.04)	(0.04)
Career perspectives	0.04	0.15***	0.14***	0.08
	(0.05)	(0.04)	(0.04)	(0.05)
Feel at home	0.44***	0.30***	0.33***	0.38***
	(0.06)	(0.05)	(0.05)	(0.05)
cut1				
Constant	0.04	17.06	-19.28	-7.42
	(2.76)	(10.84)	(18.82)	(5.25)
cut2				
Constant	1.42	18.63	-17.92	-5.81
	(2.76)	(10.85)	(18.82)	(5.25)
cut3				
Constant	3.90	21.12	-15.48	-3.20
	(2.76)	(10.86)	(18.82)	(5.24)
N. Obs.	1649	1950	2094	2256

Note. Includes socioeconomics and country variables as controls. Standard errors in parentheses:
* $p < .10$, ** $p < .05$, *** $p < .01$.

Finally, Table 5 shows estimates based on employees' levels of education. This table contains three levels of education. Model 1 includes levels 1 and 2 of the ISCED 1997, primary education and lower secondary education. Model 2 of Table 5 includes levels 3 and 4 of ISCED 1997, upper-secondary education and post-secondary, non-tertiary education. Finally, Model 3 includes individuals from levels 5 and 6 of ISCED 1997, first stage of tertiary education and second stage of tertiary education, respectively. Eurofound (2013) showed that in the extent that occupations become more complex and the level of skills needed to perform those tasks increase, bosses offered higher levels of autonomy and better conditions to skilled workers. These specific skills were, at the same time, associated to higher amounts of education; therefore, analysts could expect some differences according to educational levels.

Table 5
Estimates by Education levels

	Model 1	Model 2	Model 3
Autonomy index	0.021	0.233*	-0.037
	(0.152)	(0.112)	(0.179)
Team work index	0.102	0.026	0.076
	(0.116)	(0.086)	(0.105)
Job rotation index	-0.046	-0.067	0.033
	(0.083)	(0.061)	(0.080)
Skill index	0.093	-0.030	0.039
	(0.128)	(0.090)	(0.125)
Employee involvement	0.228	0.323**	0.436**
	(0.154)	(0.103)	(0.148)
Incentive index	0.340	-0.239	0.175
	(0.295)	(0.149)	(0.192)
Break	0.036	0.038	0.051
	(0.034)	(0.024)	(0.032)
Time arrangement	0.111**	0.033	0.001
	(0.043)	(0.033)	(0.042)
Work.Life balance	0.326***	0.319***	0.309***
	(0.062)	(0.042)	(0.058)
Employability	0.072*	-0.005	0.041
	(0.034)	(0.026)	(0.034)
Motivation	0.376***	0.238***	0.284***
	(0.055)	(0.036)	(0.053)
Well paid	0.211***	0.255***	0.246***
	(0.044)	(0.035)	(0.041)
Career perspectives	0.086*	0.106**	0.117**
	(0.042)	(0.033)	(0.041)
Feel at home	0.268***	0.349***	0.343***
	(0.051)	(0.039)	(0.051)
Demographic, economic and country variables	Yes	Yes	Yes
cut1			
Constant	-0.433	-0.095	0.832
	(1.098)	(0.751)	(1.013)
cut2			
Constant	1.237	1.246	2.298*
	(1.099)	(0.748)	(1.020)
cut3			
Constant	3.816***	3.737***	4.714***
	(1.104)	(0.750)	(1.030)
N. Obs.	2038	4413	3048

Note. Includes socioeconomics and country variables as controls. Standard errors in parentheses:
* $p < .10$, ** $p < .05$, *** $p < .01$.

Results in Table 5 confirmed the expected results. The autonomy index had a positive influence on job satisfaction for workers with ISCED levels of education 3 or 4. As in previous estimations, the involvement index had a positive effect on job satisfaction for employees that were more educated but not in those with levels of education below lower secondary education. Similarly, the level of employability provided by their current main jobs and the possibility to take time off during a working day to take care of personal or family matters positively influenced workers with lower levels of education. This could be due to the nature of tasks within low skilled jobs, that the jobs are more repetitive and routine, and that the jobs provide less room to increase involvement or autonomy. Nevertheless, motivation, work-life balance, well-paying jobs, and the feeling of being at home had a positive and significant influence on job satisfaction in all three models.

In general, these results could have important implications in terms of human resource management. The positive relationship between high involvement practices and career motivation, career perspective, and the feeling of being at home with job satisfaction, especially, confirmed that companies should address human resource practices to enhance, support, and develop career motivation. Some empirical works support that motivation has a positive influence on organizational and affective commitment (Alniaçik, Alniaçik, Akcin, & Erhat 2012). At the same time, other studies conclude that some types of satisfaction have a positive effect on job performance (Arshadi, 2010).

Conclusions

This study contained an investigation of the relationship between job satisfaction and the implementation of the HPWS models. The main objective was to examine how practices introduced using HPWSs could affect the wellbeing of workers in terms of job satisfaction. In order to do this, this study used variables suggested in previous literature to allow easier comparison and take previous definitions of HPWS into account. In addition and because this paper uses a large-scale database to analyze the effect of HPWS on job satisfaction, the analysis used regional groups, rather than separate countries. This study showed scores for all the indexes and variables for the regions.

Several dicfferences arose in the comparison between different groups of countries. In particular, Nordic countries had the highest scores and east south and southern countries reported the lowest scores. The measure of job satisfaction used in this study presents some limitations, in the extent that it captures only overall satisfaction without providing further distinctions between different sources or types of satisfaction. Nevertheless, it could be a useful measure in order to provide a broad perspective of the nature of the relationship between HPWS and job satisfaction in the EU27. Results show that, in general, the level of involvement, the possibility to arrange time for personal and family matters, motivation, the perception of being paid well, career prospects, and the feeling of being at home in the work environment had a positive influence in the levels of job satisfaction.

Results neither by regions nor by gender showed important differences. On the other hand, age and level of education actually reflected findings that are more interesting. Age, autonomy index, and involvement influenced the level of satisfaction positively. In addition, career perspectives positively influenced job satisfaction in workers between 30 and 49 years of age, while better career perspectives seemed to satisfy younger and older workers more. Education, employability, and possibility to arrange time for personal and family matters positively affected the wellbeing of individuals with lower levels of education. This fact could relate to the idea that there are higher levels of unemployment among workers from ISCED levels 1 and 2 in comparison with levels 3 and above. In fact, Eurostat figures for 2013 reported a 17.9% unemployment rate for workers with education levels of 1 and 2, 8.5% for workers from education levels 3 and 4, and 6.9% for workers from levels 5 and 6. These figures reflected the vulnerability for less educated workers and explained the importance of employability in measuring job satisfaction.

Results confirmed the findings reported by Eurofound (2013) and Origo and Pagani (2008) in respect to the positive effects of employee involvement. Nevertheless, this evidence only partially supported that HPWS contributed to increased job satisfaction in EU27. In fact, the negative influence of rotation and the incentive index in the case of east south and Southern countries perhaps revealed important differences in cultural organization between European countries, which deserves further research.

Endnotes

[1] EU27 include the following countries: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, and the United Kingdom.

[2] Continental: Austria, Belgium, France, Germany, Luxembourg, and the Netherlands. East Central: Czech Republic, Hungary, Poland, Slovakia, and Slovenia. East north: Estonia, Latvia, and Lithuania. East south: Bulgaria and Romania. Nordic: Denmark, Finland, and Sweden. North West: Ireland and the UK. Southern: Greece, Italy, Spain, and Portugal. Mediterranean Islands: Cyprus and Malta.

[3] This includes implementing Cronbach's alpha tests for internal consistency of these constructs ranging along recommended values.

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Appendix

Table A1
Variable Description

Variable	Description	Mean	Std. Dev.
Female	1 if female	0.48	0.49
Income	Net monthly earnings from main paid job in Euro	1135.31	1053.55
Age	Age	41.68	12.15
Age2	Age squared	1885.37	1044.88
Fixed	Fixed term contract	0.13	0.33
Legislator	1 if Legislator, senior official and managers	0.08	0.28
Professionals	1 if Professional	0.14	0.35
Technicians	1 if Technicians and associate professionals	0.14	0.34
Clerk	1 if Clerk	0.09	0.29
Servwork	1 if Service workers and shop and market sales workers	0.17	0.38
Skilled	1 if Skilled agricultural and fishery workers	0.04	0.19
Craft	1 if Craft and related trades workers	0.11	0.32
Operators	1 if Plant and machine operators and assemblers	0.07	0.27
Elemwork	1 if Elementary occupations	0.10	0.30
Manuf	1 if Manufacturing	0.13	0.34
Utilities	1 if Electricity, gas, and water supply	0.01	0.11
Constru	1 if Construction	0.06	0.25
Retail	1 if Wholesale and retail trade; repair of motor vehicles and motorcycles	0.15	0.36
Hotelres	1 if Hotels and restaurants	0.04	0.21
Transcom	1 if Transport, storage and communication	0.06	0.23
Finance	1 if Financial intermediation and real estate activities	0.10	0.31
Publicadmin	1 if Public administration and defense; compulsory social security	0.72	0.44
Edusalud	1 if Education and health and social work	0.18	0.38
Otherserv	1 if Other service activities	0.07	0.25
Hogaong	1 if Activities of households and activities of extraterritorial organizations and bodies	0.01	0.12
Size1049	1 if 10-49 workers	0.27	0.44
Size5099	1 if 50-99 workers	0.09	0.29
Size100249	1 if 100-249 workers	0.07	0.27
Size250499	1 if 250-499 workers	0.03	0.19
Size500	1 if >500 workers	0.06	0.23
Ett	1 if type of employment contract is with a temporary employment agency contract	0.01	0.11
Apprenticeship	1 if type of employment contract is an apprenticeship or other training scheme	0.00	0.07
Nocontract	1 if no contract	0.08	0.28
Other	1 if other	0.08	0.09
Supervision	No. of people working under the supervision of worker	2.26	48.77
Hourswork	No. of hours worked per week	39.09	13.24
Hoursnight	No. of times a month worked (at least 2 hours) between 10.00 pm and 05.00 am	1.29	3.90
Satsun	No. of times a month on Saturdays and Sundays	5.23	22.27
Tenhours	No. of times a month worked more than 10 hours a day?	2.47	5.61
Shift	1 if work shifts	0.17	0.38