Work autonomy, work pressure and job satisfaction – A comparative analysis of 15 EU countries (1995 - 2010)

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ABSTRACT:

Based on micro-data, we show that work autonomy has declined and work pressure increased in almost all EU countries since 1995. Since that evolution is substantially detrimental for workers, we examine whether workers of varied skill levels in different countries have been equally impacted. Descriptive analysis shows that low-skill clerical workers are the most affected and that Scandinavian countries fare better. Econometric results show that the decline in job satisfaction is due mainly to the increase in work pressure - which might be reaching a limit for high-skill workers - and that job satisfaction is most affected by an increase in work pressure when this is not accompanied by greater work autonomy.

1. Introduction

Autonomy at work is shown to have a favorable impact on workers' well-being (Knudsen et al, 2011; Bauer, 2004; Ryan and Deci, 2000) as well as on their performance and creativity (Akerlof and Kranton, 2008; Gagné and Deci, 2005; Breaugh, 1985). Raising work autonomy would hence provide a "win-win" situation with benefits for both employers and employees. In contrast, enhanced work intensity, which is also known to improve performance and productivity, is associated to negative health outcomes (Danna and Griffin, 1999; Dejours, 2009) and declining job satisfaction (Green, 2006).

However, the impact of work autonomy and work intensity on workers' well-being can only be plainly assessed after taking into account the combined levels of both factors. Indeed, Karasek (1979) showed that specific combinations of work autonomy and work intensity may have effects on well-being that go beyond the isolated effect of each factor. His demand-control model, further developed in Karasek and Theorell (1990) and supported thereafter by hundreds of studies, posits that jobs defined by heavy demands – high work load and time constraints - and low control – low decision latitude on how to meet these demands – result in mental strain, stress and health problems. Conversely, jobs with high demands and high autonomy, on one hand, and jobs with low demands and low autonomy, on the other hand, would be associated with good health indicators and job satisfaction. As the overall correlation between work autonomy and work intensity is generally low, some groups of workers may suffer from discrepant demands and autonomy levels.

Empirical evidence reveals that while satisfaction with extrinsic aspects of jobs – pay, hours of work, health and safety – has improved or stabilized in recent decades (Clark, 2005; Eurofond, 2010), satisfaction with job content and other intrinsic aspects of work, such as work autonomy and work intensity, seems to have decreased in several EU countries (Eurofond, 2007; Clark, 2005). In fact, the trends towards work intensification and declining discretion at work are shown to be at the root of the decline in job satisfaction in the UK (Green, 2004, 2006; Green and Tsitsianis, 2005), a result consistent with Karasek and Theorell's model.

Based on the abovementioned theoretical framework, the present paper aims to assess the extent to which the combined evolution of work intensity and work autonomy by skill level affects job satisfaction, using micro data from the European Working Conditions Survey (EWCS) for fifteen EU countries since 1995. In a first step, we use several items of the questionnaire to construct reliable synthesis indicators of work autonomy and work intensity. We then assess how both constructs and job satisfaction have evolved in EU-15 countries. In a

3

second step, we use econometric analysis to study how the joint evolution of work intensity and work autonomy affects and explains the evolution of job satisfaction.

Our analysis allows us to see whether the trends observed in the UK and their impact on job satisfaction hold in other countries and for workers of different skill levels. Countries pertaining to the Scandinavian welfare regime are known to benefit from higher job quality (Davoine et al, 2008; Gallie, 2003). It will be interesting to study how job satisfaction, work autonomy and work intensity have evolved in these countries when compared to the UK, the Continental and South European countries. Are we facing a deepening or a smoothing of the differences between the European welfare regimes in the intrinsic aspects of work? Are low-skill and high-skill workers in the different countries equally affected by the decline in work autonomy and increase in work intensity?

Following Karasek and Theorell, our main hypothesis is that an increase in work intensity is less harmful to the worker's satisfaction if he/she enjoys high autonomy. But there may well be an upper limit to work intensity, regardless of autonomy levels. We then also test whether growing levels of work intensity are increasingly detrimental for workers. The growth of the psychosocial work-related problems in Scandinavian countries (Busck et al, 2010), in which both work autonomy and work intensity are high, may well be a symptom of such a situation.

Existing empirical studies, mostly grounded on national data, cover only few countries over different time periods. By drawing on a unique data source, we provide solid and up-dated comparative evidence of how work autonomy, work intensity and job satisfaction have evolved over the last fifteen years in fifteen EU countries. Cross-national research is particularly valuable to establish the generality of findings and the validity of interpretations derived from single-nation studies. Moreover, the cross-national comparisons provide the opportunity to assess whether and the extent to which different institutional settings impact the quality of work life.

The paper is structured as follows. We begin by questioning the use of job satisfaction as an indicator of well-being at work and explain the perspective in which it is used here. Section Three presents the data and empirical strategy, followed by a description of the trends in job satisfaction since 1995 in the fifteen countries studied. In section Four we build indicators of work autonomy and work pressure and analyze their evolution by skill level and country.

Section Five conducts econometric analyses of the relation between job satisfaction, work autonomy and work pressure. Section Six discusses the results and concludes.

2. Job satisfaction as an indicator of well-being at work

Conventional economists take self-reported data on job satisfaction as a proxy variable for the workers' utility without further questioning. However, the interpretation of self-reported job satisfaction is a particularly perilous endeavor: it is never possible to know exactly what the respondents are saying. Job satisfaction is often defined as the way people feel about their job and whether they like it; it would hence have a primarily affective character. But it is also recognized that job satisfaction has a cognitive dimension and is therefore also an evaluative judgment about one or several aspects of the job. This makes job satisfaction a multi-dimensional construct difficult to interpret. Moreover, job satisfaction is shown to depend on personality traits (Judge et al, 2001) and its perception is culturally biased (Sousa-Poza, 2000).

Empirically, this intricacy results in the existence of substantive divergences between objective working conditions and self-reported job satisfaction. Bustillo et al (2011) clearly show that there is hardly any congruence between actual working conditions and job satisfaction across countries. The range of variation of the latter is extremely small even when comparing very different countries in terms of their economic development. In fact, the range of variation in job satisfaction is higher within than across countries, but it is still not clear whether it captures real differences in job quality.

Social scientists generally explain these discrepancies by the fact that workers adapt to their actual work experience. Job satisfaction is assessed by workers in part in relation to what they expect from the job. While some workers might be led to expect a lot, others might be resigned to expecting little. So everything depends on the norms against which preferences and judgments are formed. It is difficult for both the analyst and the respondent to distinguish between "true" satisfaction and resignation - adaptation of preferences and aspirations to the opportunities actually available[1]. For instance, low-wage workers sometimes express higher satisfaction than high-wage workers: low earners may report being "satisfied" in their jobs simply because they have a low benchmark level of norms and aspirations (Brown et al, 2007).

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[1] Self-reported job satisfaction is known to be biased not only by adaptive processes but also by social comparisons, recent life events and other emotional and cognitive psychological processes.

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In other words, disadvantaged workers adjust their expectations to what they see feasible in an attempt to make life bearable in adverse situations.

To the extent that job satisfaction depends on the existing gap between aspirations and achievements, the workers' evaluation of their jobs is only partially related to their objective working conditions. With this in mind, Poggi (2010) studied the effect of working conditions on aspiration biases and analyzed the impact of positive and negative aspiration biases on job satisfaction. Her results show that aspiration biases do seem to be positively affected by good working conditions and negatively affected by bad working conditions; that is, adaptation processes do exist and provoke aspiration biases. On average, negative divergence between actual working conditions and high aspirations has a stronger effect on reducing job satisfaction than positive divergence between low aspirations and reality on increasing job satisfaction. This makes crucial to control for variables that may affect workers' expectations, mainly skill-level and country.

Despite these important limitations, information on job satisfaction remains valuable. On one hand, it is robustly proven to relate to actual behaviors such as absenteeism and turnover (Spector, 1986; Utman, 1997; Warr, 1999). On another, job satisfaction transmits useful information about how workers perceive their work life, about how they feel about and evaluate their job. Even though job satisfaction is not an accurate indicator of the "value" of a job - assessed in terms of the extent in which a job objectively provides the conditions for human flourishing, it is valuable to complement objective measures. In this paper, like Green (2006) and Green and Tsitsianis (2005), we consider that even if the *levels* of job satisfaction do not convey adequate measures of workers' "true" well-being, *changes* in job satisfaction over time constitute reliable indications of changes in well-being at work. The analysis below will therefore focus in particular on trends in job satisfaction and on its relationship with other variables rather than on the comparison of job satisfaction levels between individuals and across countries.

In the UK (but not in Germany), the decline in job satisfaction is found to be associated with the decrease in work autonomy[2] and with the increase in work intensity (Green, 2004, 2006; Green and Tsitsianis, 2005). Indeed, job satisfaction is shown to increase in line with the degree

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[2] Terminology is far from stabilized. Green and Gallie use "task discretion" while Karasek prefers "job control" or "decision latitude". Such oscillations are only partially explained by the information included in the indicators. We use "work autonomy" as this seems to be the term common to psychologists, sociologists and economists, notwithstanding the many facets of the phenomenon and the corresponding necessary nuances.

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of autonomy enjoyed in the job (Nguyen et al, 2003), a result which holds in different countries and for a wide array of job autonomy indicators (Eurofond, 2007). Conversely, work pressure is found to be associated to negative health outcomes (Danna and Griffin, 1999; Dejours, 2009), which predicts a strong negative association between work intensity and job satisfaction. Karasek and Theorell (1990) made a decisive contribution to the understanding of both phenomena by showing that the positive effect of work autonomy on job satisfaction may be partially or totally outweighed by the negative effect of work intensity.

1. Data, empirical strategy and the evolution of job satisfaction

The levels and trends in work autonomy, work intensity and job satisfaction are studied using the 1995, 2000, 2005 and 2010 waves of the European Working Conditions Survey (EWCS), a cross-sectional dataset that provides unique and very detailed information on the quality of work in Europe. The EWCS is questionnaire-based, administered using face to face interviews with approximately 1000 individuals in their homes in each of the EU countries. Every wave sample is representative of those aged 15 years and over who are in employment. In the 2010 EWCS sample, a multi-stage, stratified random sampling design was used in each country, while the 2005 sample used a multi-stage, stratified and clustered design with either a 'random walk' procedure to select respondents at the last stage or a phone register selection[3]. Previous waves used a multi-stage, "random walk" procedure (see EWCS 1995 and 2000 Final Reports).

The data analysis follows various steps. We first concentrate on assessing the reliability of the job satisfaction question in the EWCS and analyze its evolution from 1995 to 2010 in the 15 EU countries for which data is available for the four waves (see Table 1A and 2A for a description of the variables and summary statistics). In a second step, we build indicators of work autonomy and work intensity and examine their evolution by skill level and country (section Four). The association between work autonomy, work intensity and job satisfaction is studied in a third step by using regression models (section Five).

Although the EWCS wording ("On the whole, are you very satisfied, satisfied, not very satisfied or not at all satisfied with working conditions in your main paid job?") is different from the standard job satisfaction question since it mentions "satisfaction with working

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[3] See http://www.eurofound.europa.eu/surveys/ewcs/2010/sampling.htm and
http://www.eurofound.europa.eu/docs/ewco/4EWCS/Methodology.pdf for further information.

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conditions" instead of "satisfaction with your job", it is currently used as a job satisfaction measure. Nonetheless, in order to validate the EWCS question, a categorical principal component analysis (CatPCA) was carried out over four items measuring other aspects of satisfaction at work (results available on demand). CatPCA confirmed that the items relate to a single underlying dimension which in turn correlates significantly with the "*satisfaction with working conditions*" question. Poggi (2010) performed a different validation exercise that reached the same results. Finally, reference must be made to the fact that the question comes at the very end of the questionnaire, when respondents had already been asked about all dimensions of their job. The satisfaction with working conditions question can therefore be reliably used as a proxy for job satisfaction.

As mentioned above, the sole observation of the aggregate trends at the European or national level might conceal significant divergences between workers of different skill levels. To distinguish between groups of workers, we use the Eurofond classification of the occupational classes of the workers' jobs in four categories of skill level[4]: High Skill Clerical – HSC; Low Skill Clerical – LSC; High Skill Manual – HSM; and Low Skill Manual – LSM (see Table 1A in the Appendix).

The analysis of average job satisfaction by skill level reveals that, in each wave and overall, high-skill workers display higher levels of satisfaction than low-skill workers, and clerical workers are on average more satisfied than manual workers (Table 1). As for trends, average satisfaction in 1995 was higher than in any other year for all skill levels. There is a marked decline in the satisfaction of clerical workers over the years whereas the satisfaction of manual workers seems to have stabilized in the 2000s.

Table 1. Average job satisfaction by year and skill level

	1995	2000	2005	2010	Total
High-skill clerical	3.30	3.26	3.23	3.21	3.25
Low-skill clerical	3.17	3.14	3.12	3.12	3.14
High-skill manual	3.04	2.95	2.96	2.97	2.98
Low-skill manual	2.94	2.89	2.88	2.91	2.90
Total	3.13	3.08	3.07	3.08	3.09

Note: job satisfaction goes from 1 – not at all satisfied to 4 – very satisfied.

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[4] See http://wwww.eurofound.europa.eu/surveys/ewcs/2010/methodology.htm for details.

Though declining, there is not a very pronounced trend in average job satisfaction. We therefore examined the evolution in the percentage of "very satisfied" workers, which decreased significantly. Differences between 1995 and 2010 are significant (p < 0.001) for all skill levels (Table 2). The steadiness of the average level of job satisfaction results from two phenomena: the decline in the number of "very satisfied", which lowers the average satisfaction, and the decline in the "not at all satisfied" workers, which has the contrary effect on average job satisfaction.

**Table 2. Proportion of "Very satisfied" workers by year and skill level**

	1995	2000	2005	2010	2010 − 1995
High-skill clerical	0.42	0.36	0.35	0.33	-0.09*
n=	2313	3300	2585	3832	
Low-skill clerical	0.33	0.31	0.29	0.27	-0.06*
n=	5599	8097	5342	8708	
High-skill manual	0.24	0.19	0.18	0.17	-0.07*
n=	2135	2893	1659	2495	
Low-skill manual	0.22	0.19	0.16	0.18	-0.04*
n=	2415	3519	2611	3479	
Total	0.31	0.28	0.26	0.25	-0.06*
n=	12462	17809	12197	18514	

* Significant difference at the 0.001 level

As mentioned, we do not consider it relevant to comment differences in job satisfaction across countries due to the several cultural biases surrounding the job satisfaction indicator. By contrast, changes in job satisfaction can be trusted to signal actual differences in the workers' well-being. The analysis of Figure 1[5] shows that the proportion of very satisfied workers declined in almost all 15 countries and for all skill levels. Exceptions are Greece, low-skill manual workers in the UK and Denmark, and low-skill clerical workers in the UK and Spain. The decline is particularly large in Belgium, Ireland and the Netherlands, and is considerable in Sweden and Finland. In the Scandinavian countries and the Netherlands, job satisfaction declined most among clerical workers.

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[5] To facilitate reading, only the first and last years are represented in the Figures. Complete information is available on request.

Fig 1: Proportion of "Very satisfied" workers by skill level and country (1995 and 2010)
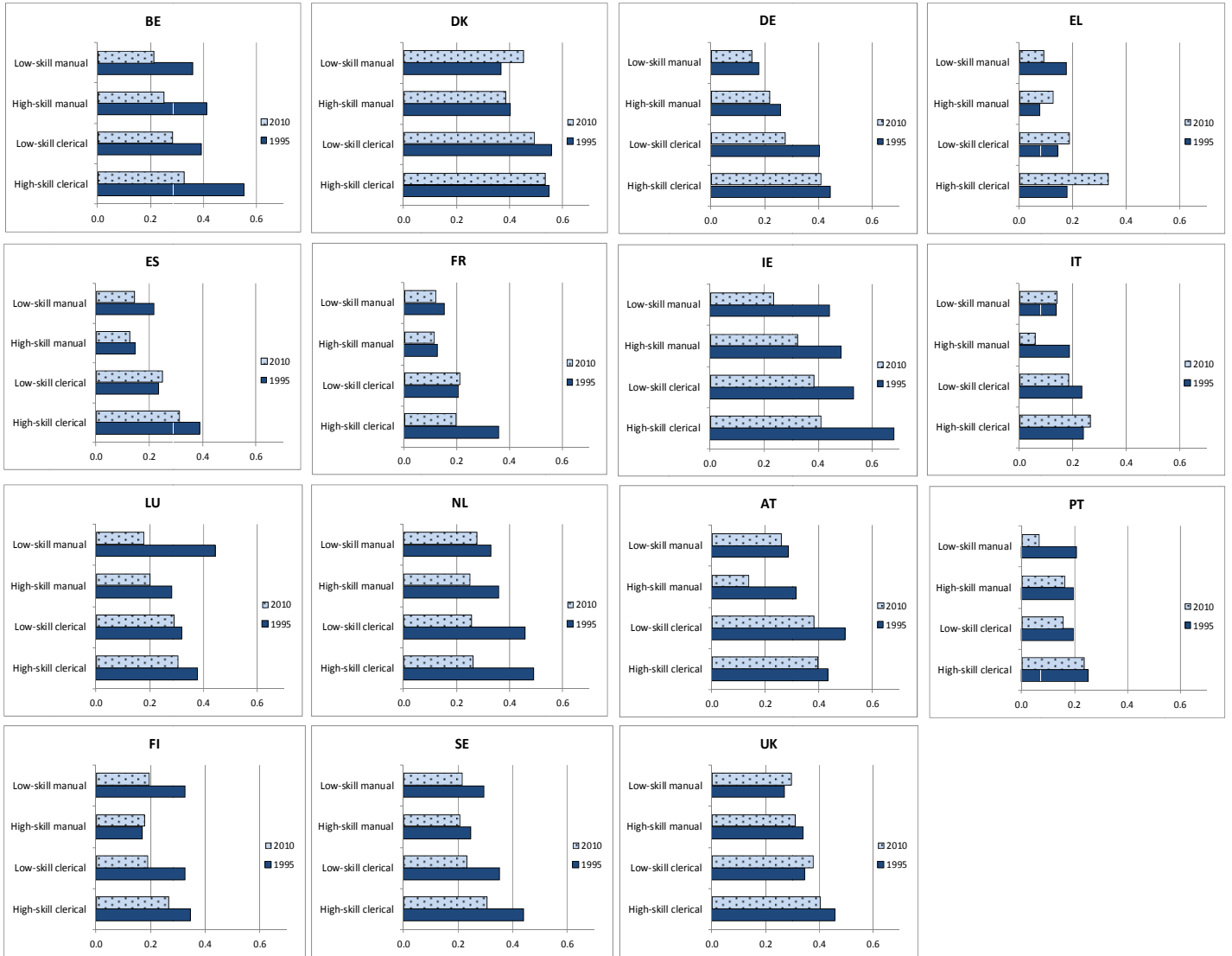
2.   The evolution of work autonomy and work intensity in the EU

If the findings mentioned in the introduction hold, i.e., if work autonomy is actually related to job performance and job satisfaction, one would expect to see work autonomy steadily increasing for all workers over time and space. However, some studies show that there is no performance advantage to autonomous motivation for low-skill jobs (Gagné and Deci, 2005); while work autonomy is shown to promote performance in jobs requiring high levels of commitment, control devices have been found to yield superior short-term performance in unskilled tasks. Managers seeking efficiency would therefore discriminate between workers and a polarization process would be observed, marked by a long-term decline in job autonomy for the workers in less skilled jobs.

With regard work intensity, diverse theories have predicted a structural trend towards work intensification in capitalist economies, and the progressive catching-up of emerging economies might well provoke an acceleration of the phenomenon in Europe in an effort to maintain higher levels of economic efficiency. However, work intensification is not an unlimited process and there is evidence that European workers are already subject to high work strain. As predicted by Karasek and Theorell (1990), evidence shows that the combination of high work intensity and low autonomy is associated to high risks of cardiovascular disease, depression, insomnia and musculoskeletal disorders (Siegrist, 2006). An increase in work intensity is hence to be expected for all skill levels but it might be less pronounced for workers with already high work intensity or low work autonomy.

Although all countries face similar competitive demands and economic constraints, national institutional settings and cultural specificities may strongly impact the levels and trends of work-related variables. In effect, the different welfare regimes exhibit substantially different levels of job quality (Esser and Olsen, 2011; Davoine et al, 2008; Gallie, 2003). Therefore, because of their more egalitarian regimes, higher trade union membership and labor-oriented policies, we expect the Scandinavian countries to display better levels of intrinsic job quality and less difference among groups of workers. Conversely, South European countries are expected to fare worse in terms of both work autonomy and work intensity levels and polarization trends, while Continental and Anglo-Saxon countries would display average positions.

As for work autonomy, we rely on Lopes et al (2012)'s indicators, based on seven questions of the EWCS that reasonably cover what Karasek (1979) calls "job control" (see Table 1A in the

11

Appendix). The means and number of valid cases for all seven variables in each wave can be found in Table 4A in the appendix. We conducted the same Principal Components Analysis (PCA) and obtained the same scores, which we use in the analysis below. We also chose to keep Lopes et al (2012)s' terminology - inspired in Breaugh (1985) – labeling the first factor "work method and scheduling autonomy" (WMSA) and the second factor "work criteria autonomy" (WCA). While WMSA refers to the degree of control that workers perceive is being exerted on when and how they carry out their work tasks, WCA refers to the learning opportunities available in their job and to whether they asses the quality of their work. In other words, WMSA shows the control workers have over their methods and schedules, while WCA shows the control workers have over their work content. The two constructs are often combined to give a single index of work control in spite of evidence that the constructs are empirically distinct (Mansell and Brough, 2005). Our PCA also systematically revealed that work autonomy is a bi-dimensional phenomenon. We hence preferred not to subsume it into a single additive scale. In fact, results show that the behavior of both measures of autonomy differs across the four skill levels in a meaningful way.

Overall, work autonomy declined significantly over the period (see last rows of Table 3). Results confirm the "Scandinavian exception": work autonomy levels in Denmark, Finland, the Netherlands and Sweden are above the EU average for all groups of workers and there is much less difference between clerical and manual workers and between low-skill and high-skill workers than in all other countries, where manual workers systematically suffer from below average work autonomy (see Figure 1A in the Appendix). In addition, whereas work autonomy decreased in all other countries from 1995 to 2010, it stabilized or increased in Denmark, Finland, the Netherlands and Sweden. As for polarization processes, the situation of manual workers in the 15 studied countries has not deteriorated when compared to clerical workers. By contrast, a clear polarization process is under way between high-skill and low-skill clerical workers. For work autonomy, our expectations regarding polarization trends and welfare regimes are hence partially confirmed (for complete analysis, see Lopes et al., 2012).

We now concentrate on examining the levels and trends in work intensity – which we also expect to vary across countries grouped by type of welfare regime – and analyzing the combined evolution of work intensity and work autonomy by skill level and by country.

Measuring work intensity - or job demands, in Karasek's terms - requires information on work load or work effort. However, no such data is available in the four EWCS waves. To construct our indicator, we used the two questions traditionally examined in studies of work intensity

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based on EWCS ("Does your job involve working at very high speed?" and "Does your job involve working to tight deadlines?") to which we added questions related to potentially stressful patterns of work such as: reliance on work done by colleagues, previously defined performance targets, and time constraint.

Contrary to the responses to the other questions, the set of possible responses to the time constraint question ("You have enough time to get the job done") differs across waves: the 1995 and 2000 waves required a yes/no answer but the 2005 and 2010 waves proposed an ordered set of categories (see Table 3A in the Appendix). The ordinal nature of some variables and the dichotomous nature of others led us to use Categorical Principal Components Analysis. CatPCA also presents the advantage of incorporating a sophisticated option that only takes into account the non-missing data when the loss function is minimized (Meulman *et al*, 2004), and it allows the score computation for all objects with at least one valid response. Thus, the question on time constraint could be included in the analysis even though there are valid observations for only two waves for each set of possible responses. CatPCA reveals that the five items load on a single factor[6]. Cronbach's alpha for the index is 0.71, indicating sufficient internal consistency.

The resulting indicator, named "work pressure" rather than work intensity for the sake of rigor, fully exploits the information available in the EWCS and contains reliable information on an important dimension of job demands. The (standardized) score on this factor is used hereafter as the Work Pressure indicator (dataset pooled). Values above zero correspond to above EU-average work pressure while negative values correspond to below EU-average work pressure.

Table 3 shows that, with minor exceptions, perceived work pressure has been steadily increasing over the years for all skill levels. Differences for the period are significant at the 0.001 level for all skill levels. The increase in work pressure has been higher for high-skill clerical workers – who suffer from the highest levels of work pressure at the end of the period while enjoying relatively low levels at the beginning - and lower for low-skill manual workers. These findings suggest that it is high skill clerical workers who have seen their situation deteriorate the most, but definite conclusions can only be drawn from the analysis of the combined evolution of work autonomy and work pressure.

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[6] Eigenvalue is 2.43.

Table 3. Work pressure and work autonomy scores over time, all countries pooled

	1995	2000	2005	2010	2010-1995
Work Pressure:					
High-skill clerical	-0.144	-0.162	0.157	0.214	0.358*
n=	2326	3310	2599	3847	
Low-skill clerical	-0.291	-0.278	0.043	-0.024	0.267*
n=	5631	8118	5373	8758	
High-skill manual	0.15	0.19	0.533	0.41	0.260*
n=	2140	2912	1671	2508	
Low-skill manual	-0.047	0.014	0.094	0.179	0.226*
n=	2433	3558	2625	3515	
Total	-0.141	-0.122	0.145	0.122	0.263*
n=	12531	17898	12267	18628	
Work Autonomy: WMSA	0.023	0.011	-0.028	-0,008	-0.031*
n=	12517	17880	12249	18598	
WCA	0.116	-0.012	-0,054	-0.030	-0.146*
n=	12517	17880	12249	18598	

* Significant difference at the 0.001 level

Note: the 0.00 score corresponds to the average level of work pressure or work autonomy of all workers for all waves; a negative score means below average work pressure or work autonomy while a positive score means above average work pressure/autonomy.

Overall, an increase in work pressure and a decrease in work autonomy are observed. Such evolution may have strong negative implications on job satisfaction, since the increase in work pressure is not compensated for by an increase in work autonomy.

In terms of skill levels, Figure 2 shows that job strain clearly increased for all workers over the period: work pressure rose for all skill levels without being compensated for by any increase in work autonomy. Work autonomy decreased more intensely and work pressure increased the most between 2000 and 2005; since then, both phenomena seem to have stabilized but no reversion of the overall negative trends can be observed. Work pressure for high-skill clerical workers increased markedly but they still benefit from high, though declining, work autonomy levels[7], especially when compared to low-skill clerical workers. But according to Karasek and Theorell (1990)'s model, it is high-skill manual workers who suffer from the highest job strain since they experience the larger excess of work pressure over decision latitude.

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[7] It is interesting to note that WCA, i.e. control over work content, has risen for HSC but declined for LSM workers. Conversely, low-skill manual workers now have more control over their work methods and schedules (increasing WMSA) while high-skill clerical workers have less.

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In fact, the large discrepancy between work autonomy and work pressure for manual workers may partly explain their lower levels of job satisfaction.

Fig 2: Work autonomy (WMSA and WCA) and Work Pressure scores by skill level and year for all countries
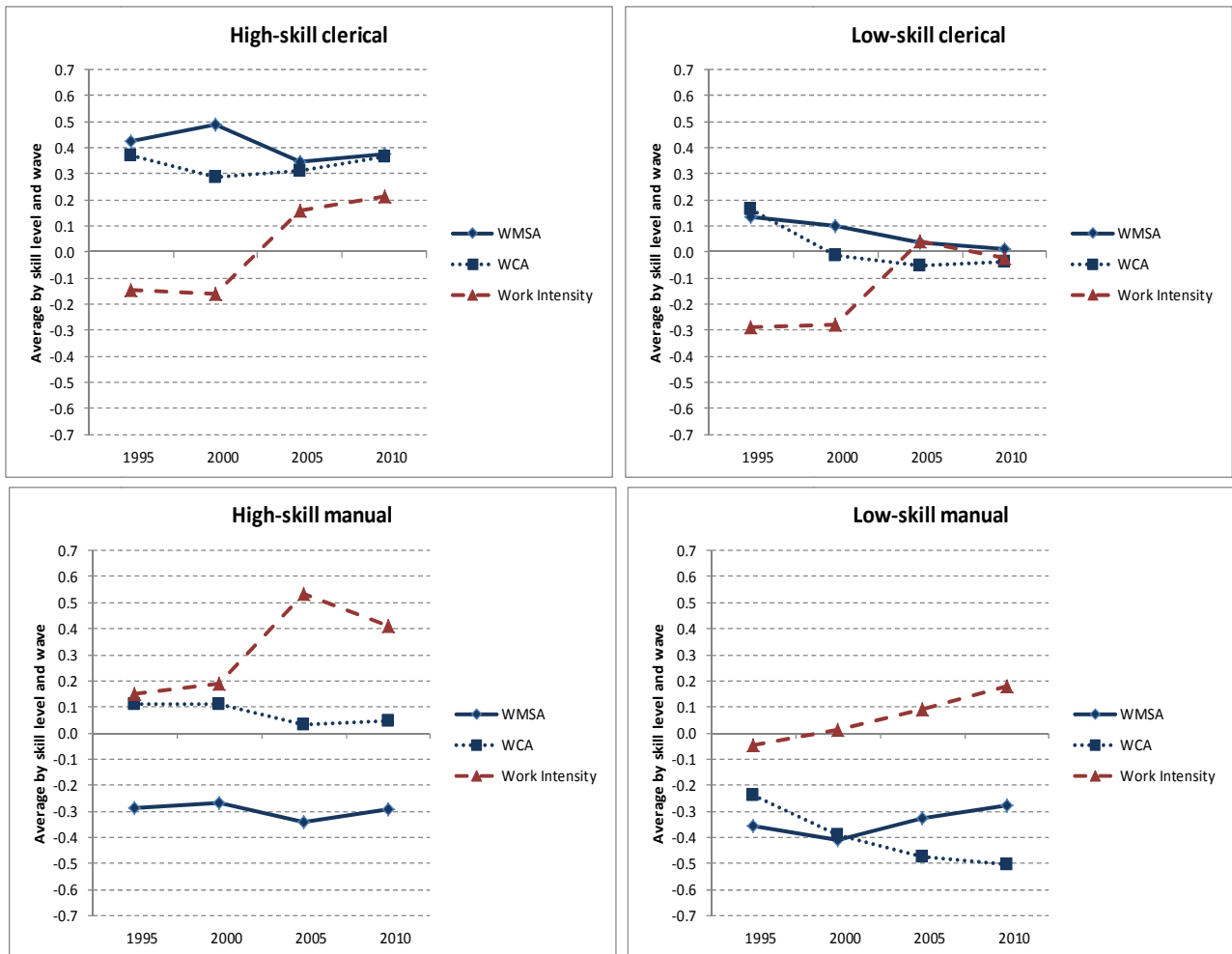
Turning now to the analysis of countries, we can see in Figure 3 that Finland and Sweden have the highest perceived work pressure over the period, followed by the Netherlands and Denmark – the four countries where work autonomy is also the highest. But we can also note that work pressure was already very high in Finland and Sweden in 1995. While closer to the Continental countries for work autonomy, the United Kingdom stands closer to the Scandinavian countries regarding work pressure, which indicates high levels of job strain in this country.

15

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Another interesting finding is that Continental countries (Belgium, Austria, Germany, France, Luxemburg) and Ireland[8] display quite high work pressure at the end of the period – in fact, these are the countries where work pressure increased the most – and yet are still characterized by rather low work autonomy. Finally, South European countries - with the exception of Greece for work pressure - display low levels of both work pressure and work autonomy. Italy stands between Continental and South European countries.

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[8] Note that for labor-related matters the Anglo-Saxon countries do not appear to create a distinct model, a fact already pointed out by Davoine et al (2008) in their study of job quality in the EU.

Fig 3: Work autonomy (WMSA and WCA) and Work Pressure by country and year

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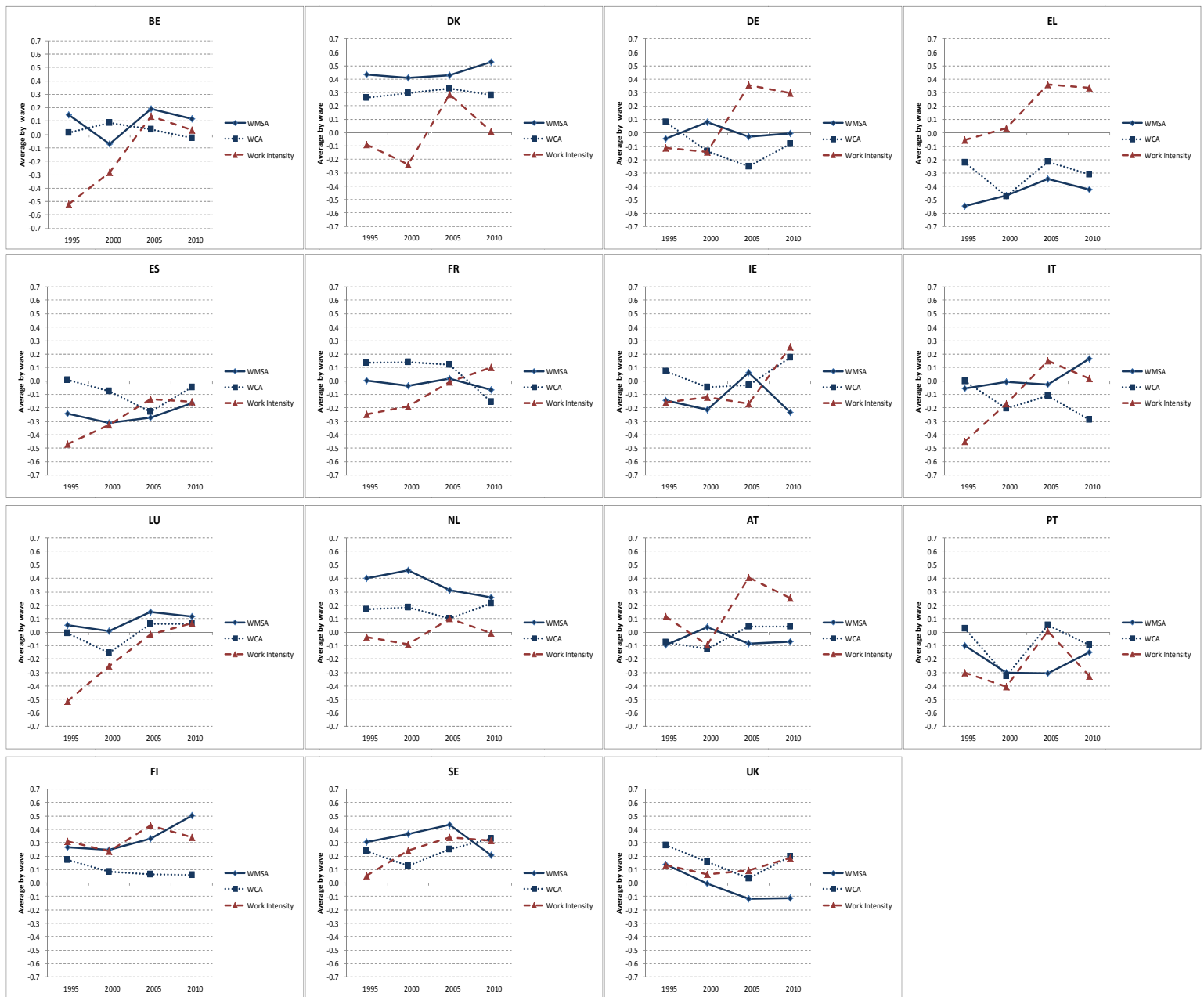
As for trends, the evolution for workers in Continental countries and Greece is the most negative: their work pressure rose significantly without being compensated for by increases in work autonomy. Conversely, workers in Scandinavian countries have seen their situation slightly worsen or stabilize. Analysis by skill level and country (Figure 2A in the Appendix) shows that whereas most clerical workers benefitted from lower work pressure than manual workers in Continental countries over the period, workers of all skill levels in Scandinavian countries experience similar levels of work pressure. The conclusions concerning polarization trends and welfare regimes are the same as for work autonomy: overall, a polarization trend is observed between high and low skill clerical workers with a deeper worsening of the latter group's situation in terms of autonomy, and Scandinavian countries offer markedly more egalitarian and higher quality jobs.

3.   Examining the relation between work autonomy, work pressure and job satisfaction

To analyze the extent to which the evolution of work autonomy and work pressure affects job satisfaction, we estimate econometric models using worker-level data and controlling for several explanatory variables of job satisfaction.

Since job satisfaction is measured through an ordered multi-level scale, we use an ordered logit regression model. Using a logistic distribution, the model explains the probability of a given level of job satisfaction using a set of independent variables. Our main interest is in the work autonomy and work pressure variables, measured using the scores obtained previously. We also introduce an interaction term between work autonomy and work pressure to capture the effect of the relation between both variables on job satisfaction. As mentioned, our hypothesis is that an increase in work pressure is less harmful to the worker's satisfaction if he/she enjoys high autonomy. This means that the coefficients of the interaction terms should be positive.

We introduce sequentially our explanatory variables, starting with the control variables. Next, we test the autonomy variables, followed by work pressure variables. The quadratic terms of both variables are then introduced. Finally, the interaction terms between the autonomy variables and work pressure are considered. The quadratic terms are introduced prior to the interaction terms to rule out the possibility that the significance of the interaction is the spurious result of a curvilinear impact of work autonomy or work pressure on job satisfaction (Mansell

18

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and Brough, 2005). One advantage of this sequential approach is that it allows understanding what occurs to the unexplained time trend as additional variables are introduced.

Our first estimated model includes only control variables (Model 1, Table 4), that is, the variables available in the four EWCS waves that theory and previous evidence show to have an influence on job satisfaction: socio-demographic features (sex and age), skill level, hours of work, and dummies for years, countries, fixed term contract and economic sector (description of variables can be found in Table 1A). [9]

In relation to the effect of skill level, the results confirm those of the descriptive analysis reported earlier: low skill workers are less satisfied than high skill workers, and manual workers experience less satisfaction than clerical workers. The time dummies indicate a significant unexplained decline in job satisfaction between 1995 and 2010. The coefficients for the other control variables are in line with previous studies on the determinants of job satisfaction.

In the second model, the introduction of the autonomy variables (Model 2, table 4) reveals that work autonomy has a significant and positive effect on job satisfaction, a result consistent with the literature. Even though the time dummies continue to be statistically significant, the reduction in their size shows that work autonomy contributes to explain the observed decline in job satisfaction.

Next, we introduced work pressure in the model and, as expected, this variable is negatively and significantly related to job satisfaction (Model 3, Table 4). An increase of one unit in work pressure (and the standard deviation of this variable is one) decreases the odds of a higher level of job satisfaction compared with a lower level by a factor of 0.40. As for work autonomy, WMSA and WCA increase the odds ratio by a factor of 0.25 and 0.22, respectively. We also observe that the 2005 and 2010 time dummies become insignificant after introducing work pressure, which means that the increase in work pressure is a highly significant factor in explaining the decline in job satisfaction in those years.

Our next step was to consider quadratic terms for WCA, WMSA and WP. Besides the reason pointed above, we consider these terms because autonomy and pressure may have non-linear effects on job satisfaction (Karasek, 1979). For example, the detrimental effect of work pressure on job satisfaction may increase as work pressure increases. An increase in work pressure would have a greater negative impact on job satisfaction for a worker with an already

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[9] The base categories are: high-skill clerical for skill level, services for economic sector and UK for country.

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high work pressure than for a worker with low work pressure. Results confirm the curvilinear effects of autonomy and pressure on job satisfaction (Model 4, Table 4). For example, assuming autonomy constant, if work pressure increases one unit for a worker with low work pressure (work pressure =-1, *ie*, one standard deviation below the mean level of work pressure) the odds of a higher level of job satisfaction compared to a lower level decreases by a factor of 0.34, while the same increase in work pressure in a worker with high work pressure (work pressure =1, *ie*, one standard deviation above the mean level of work pressure) has an impact of - 0.45.

Interestingly, the impact of both autonomy indicators increases with the level of autonomy, as can be seen by the positive sign of the squared terms of autonomy. In other words, both work pressure and work autonomy have an increasing marginal impact on job satisfaction, the former being negative and the latter positive. Workers with already large autonomy are those who most benefit from an increase in autonomy. When all other aspects remain constant, an increase in WMSA for a worker with high WMSA (=1) has a 2 times larger effect on job satisfaction than for a worker with low WMSA (=-1): the odds ratios increase 0.38 and 0.19, respectively. A possible explanation for this result is that there may be a learning process on how to cope with autonomy, a process yielding satisfaction.

Finally, we introduced the interaction terms between work pressure and work autonomy (Model 5, Table 4). The interaction terms are positive, confirming our expectation: an increase in work pressure has a smaller negative impact on job satisfaction when the workers' autonomy is high. This indicates that the moderating influence of autonomy on the effect of work pressure on job satisfaction is significant. Furthermore, a simultaneous increase of one unit in WMSA, WCA and work pressure increases the odds ratio of job satisfaction by a factor of 0.11. [10] This confirms Karasek (1979)'s prediction that high work pressure and high work autonomy levels may be associated to higher job satisfaction than low work pressure and autonomy.

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[10] Two notes should be made. Firstly, an increase of one unit in those variables is equivalent to one standard deviation increase. Secondly, in this exercise we assume the initial values of work pressure and both work autonomies to be zero, the average value.

Table 4. Regressions for job satisfaction

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
WMSA		0.328***	0.255***	0.286***	0.290***	0.246***
		(0.013)	(0.013)	(0.016)	(0.016)	(0.021)
WCA		0.135***	0.216***	0.252***	0.250***	0.219***
		(0.013)	(0.013)	(0.018)	(0.018)	(0.023)
Work Press. (WP)			-0.402***	-0.396***	-0.392***	-0.354***
			(0.0137)	(0.013)	(0.013)	(0.018)
WMSA squared				0.049***	0.062***	0.059***
				(0.014)	(0.015)	(0.019)
WCA squared				0.034***	0.024**	0.012
				(0.011)	(0.012)	(0.015)
WP squared				-0.029***	-0.027**	-0.030**
				(0.011)	(0.011)	(0.014)
WMSA*WP					0.050***	0.034**
					(0.012)	(0.016)
WCA*WP					0.047***	0.046***
					(0.012)	(0.015)
LSC	-0.246***	-0.130***	-0.195***	-0.192***	-0.190***	-0.118**
	(0.039)	(0.040)	(0.041)	(0.041)	(0.041)	(0.054)
HSM	-0.610***	-0.397***	-0.391***	-0.388***	-0.380***	-0.411***
	(0.050)	(0.050)	(0.051)	(0.051)	(0.051)	(0.070)
LSM	-0.826***	-0.530***	-0.544***	-0.540***	-0.526***	-0.451***
	(0.045)	(0.047)	(0.048)	(0.048)	(0.048)	(0.064)
Hours of work	-0.008***	-0.009***	-0.004***	-0.004***	-0.004***	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Fixed Contract	0.258***	0.217***	0.225***	0.224***	0.219***	0.103**
	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)	(0.046)
Women	-0.064**	-0.032	-0.021	-0.019	-0.015	0.00001
	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.041)
Age	-0.024***	-0.036***	-0.028***	-0.027***	-0.028***	-0.029***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.009)
Age squared	0.0003***	0.0004***	0.0003***	0.0003***	0.0003***	0.0002**
	(0.00009)	(0.00009)	(0.00009)	(0.00009)	(0.00009)	(0.0001)
Year 2000	-0.135***	-0.118***	-0.089**	-0.092**	-0.094**	
	(0.037)	(0.038)	(0.038)	(0.038)	(0.038)	
Year 2005	-0.173***	-0.137***	0.009	0.010	0.009	0.109**
	(0.041)	(0.042)	(0.042)	(0.042)	(0.042)	(0.045)
Year 2010	-0.195***	-0.167***	-0.015	-0.018	-0.021	0.104***
	(0.036)	(0.036)	(0.037)	(0.037)	(0.037)	(0.039)
Wage						0.156***
						(0.019)
Working hours fit						0.741***
						(0.026)
Workplace size						-0.034***
						(0.009)
No. observ	59388	59278	59278	59278	59278	38607
Pseudo R2	0.0703	0.0873	0.1149	0.1150	0.1076	0.1400
F(sig)	98.69	110.90	127.77	117.31	112.31	91.35
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Note: standard deviations in brackets. Other control variables also included: dummies for economic sector and country dummies. * – significant at 10% level of significance, ** – significant at 5%, and *** – significant at 1%.

21

As a robustness check and in order to assess the impact of relevant variables not yet included in the model on job satisfaction, we introduced wage, fit between work and family lives, and establishment size in the estimation model (Model 6, Table 4). As these variables were not available for 1995, we had to drop the 1995 data. The results for the autonomy and work pressure variables remain essentially the same, the three variables introduced have the impact on job satisfaction usually described in the literature.

The analysis made so far assumes that the variables have a similar impact in all countries, which may not be true. Table 5 reports a summary of the estimation results for each country separately, using data since 1995. For all countries, the coefficients of both indicators of autonomy are significant and positive while the work pressure coefficient is negative and of larger amplitude. These results show that our conclusions regarding the independent effects of work autonomy and work pressure are valid across all countries studied. However, some differences are worth noting. It is in the countries where work pressure increased the most and where work autonomy is around average (Austria, Belgium, Denmark, France, Germany and Luxemburg) that the negative effect of work pressure on job satisfaction is higher (above EU average). Conversely, for low levels of work autonomy and work pressure (Spain and Portugal), the negative effect of work pressure is below average, as is the positive effect of work autonomy. In other words, increases in work autonomy are more valued by workers in Continental and Scandinavian countries.

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Table 5. Regressions for job satisfaction by country

	WMSA	WCA	Work Pressure (WP)	WMSA*WP	WCA*WP
Austria	0.333***	0.279***	-0.370***	0.032	0.037
Belgium	0.194***	0.159***	-0.455***	0.045	0.079***
Denmark	0.314***	0.214***	-0.391***	0.145***	-0.072
Finland	0.190***	0.106*	-0.386***	0.155***	0.042
France	0.296***	0.177***	-0.495***	0.052*	0.012
Germany	0.311***	0.404***	-0.492***	0.061*	0.055*
Greece	0.140**	0.217***	-0.249***	0.081**	0.045
Ireland	0.261***	0.180***	-0.252***	0.105***	0.087**
Italy	0.292***	0.213***	-0.366***	0.064	0.105***
Luxembourg	0.275***	0.305***	-0.415***	0.135***	0.106**
Netherlands	0.316***	0.294***	-0.351***	0.129***	0.020
Portugal	0.239***	0.211***	-0.313***	0.056	-0.033
Spain	0.255***	0.294***	-0.306***	0.051	0.068*
Sweden	0.469***	0.349***	-0.331***	0.123**	0.049
UK	0.309***	0.151***	-0.304***	-0.015	0.010

Note: Control variables included: WMSA, WCA and WP squared, Hours of work, Fixed contract, Women, Age, Age squared, year dummies, dummies for economic sector, dummies for skill levels, and country dummies.
* – significant at 10% level of significance, ** – significant at 5%, and *** – significant at 1%.

To assess the extent to which the evolution of work pressure and work autonomy accounts for the average decline in satisfaction between 1995 and 2010, we followed Green (2006) and Bartolini et al. (2011). First, to simplify calculations and the interpretation of results, we estimated the job satisfaction model using OLS. Then, we computed the average change between 1995 and 2010 in each regressor. Finally, we multiplied each variable's coefficient obtained in the first step by the respective average change in the variable, but using only the coefficients significant at the 10% level. We thereby obtained the contribution of each regressor to the explanation of the average change in job satisfaction. The sum of the contribution of each explanatory variable gives us the overall predicted change in job satisfaction, which can be compared with the observed variation in job satisfaction (- 0.047).

The application of this method shows that the increase in work pressure is the main factor explaining the decline in job satisfaction, accounting for around 67% of the decline

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(Table 6). The decrease in criteria autonomy was also an important factor, explaining around 23% of the reduction in job satisfaction. WMSA accounted for only 6% of the decline in satisfaction. As suggested in the literature (Clark, 2005; Rose, 2003) the deterioration of the quality of intrinsic aspects of work outweighed the beneficial effects on job satisfaction of other features of work.

Table 6. Explaining the average change in job satisfaction

Variable	Explained change in job satisfaction	Explained change in job satisfaction in %
WMSA	-0.0029	5.7%
WCA	-0.0118	23.1%
Work Pressure	-0.0343	67.1%
Other variables	+0.0038	-7.4%
Total explained change in job satisfaction	-0.0453	88.5%

4. Discussion and concluding remarks

Our main contribution in this paper is to shed light on the long-term evolution of some intrinsic aspects of work, namely work autonomy and work pressure, in fifteen EU countries, and of its impact on the well-being of workers. Because job satisfaction is an imperfect measure of well-being at work, we concentrated on assessing the effect of the combined evolution of work pressure and work autonomy on the change – rather than the level - in job satisfaction since 1995.

Karasek and Theorell (1990) have long since highlighted the need to monitor the levels of both variables and a large body of evidence shows that when high levels of work intensity are not accompanied by high levels of work autonomy, this is definitely detrimental to the workers' well-being. Emphasis should also be given to the importance of work autonomy for psychological well-being and personal growth. The well-being generated by autonomy is not simply a subjective experience of pleasure; work autonomy has also an objective function related to vitality, psychological flexibility and self-realization. What is at stake in work

24

autonomy is hence more than the pleasantness of given work conditions; it involves one's self-esteem and opportunity for personal growth, that is, the eudaimonic dimension of well-being.

Overall, our results document a clear deterioration in the psychosocial work environments in the EU. Work pressure has risen considerably in the last fifteen years and work autonomy has not kept up with this development. On the contrary, and in contradiction with dominant managerial discourses, it seems that the changes in the organization of work of the last two decades have led to a decline in the workers' influence on when and how to do their work and, for most workers, also on the content of work. Workers are pressured to deliver more results while the tools provided to cope with such demanding situations have decreased. This means that high-strain working situations are becoming more predominant in the EU, which is shown to be highly detrimental to physical and psychological health and to result in premature retirement from work (Siegrist, 2006).

Most existing studies examine job quality at the country level. By differentiating by skill level, we have been able to document i) the very discrepant situation of manual and clerical workers in most countries and ii) the substantial divergent process taking place between high and low skill clerical workers in all but Scandinavian countries.

We also show that the differences between welfare regimes in terms of job quality are deepening rather than diminishing. Some of the distinguishing features of Scandinavian countries are i) the stabilization of work autonomy at high levels, ii) a less marked increase in work pressure than in other countries (probably because work pressure levels were already high in 1995); iii) the fact that workers of all skill levels face similar intrinsic job characteristics. Differences in job quality across countries do not therefore seem to be due to compositional effects or technological factors but rather to institutional/societal effects.

Our analysis confirms the results obtained by Dhondt et al (2002)'s for the year 2000 and testifies to their structural nature: most workers in Scandinavian countries work in "active jobs" which, by combining high levels of work autonomy and work intensity, are hypothesized to be favorable to the workers' self-development (Karasek and Theorell, 1990). By contrast, most South European workers are in "passive jobs", hypothesized to be related to low overall activity and reduced problem-solving ability. These results clearly indicate that institutional factors, e.g. the strength of trade union membership and the public policy commitment to work life quality, and societal factors, which influence firm-level management policies and work

25

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attitudes, may be of great importance. Further research should aim at better understanding the role played by institutional and cultural factors in influencing work autonomy.

Our hypothesis, inspired by Karasek and Theorell (1990), that an increase in work intensity is less harmful to the worker's satisfaction if the worker enjoys high work autonomy, was confirmed by the econometric results. Regression analyses at the country level showed that our model also performs well at the country level. The use of the method suggested in Bartolini et al (2011) revealed that the increase in work pressure and decrease in work autonomy account for most of the observed average decline in job satisfaction.

Mention should be made of some limitations of the present study. Firstly, the cross-sectional nature of the data does not allow the establishment of causal relationships, even though it was difficult to avoid mentioning causality when interpreting the results. We are aware of the potential endogeneity of working conditions in a job satisfaction model, but the features of the data make it difficult to control properly for it. Secondly, as previously mentioned, self-reported measures of intrinsic facets of work are always subject to expectations biases – this is why i) our indicators of work autonomy and work pressure comprise more information than usually found in the literature, resulting in more rigorous constructs, ii) our analysis devotes particular attention to the interpretation of observed changes.

Observed trends in intrinsic aspects of work clearly go against the desired evolution. We appear to be developing work environments that place impossible demands on workers and lead to severe health and social problems. A normative recommendation follows directly from our theoretical framework and empirical results: work processes should provide increased work autonomy, as work pressure is not likely to substantially decrease in the near future. However, one of our econometric findings (to our knowledge previously unobserved) suggests that work pressure has increasing negative marginal effects on job satisfaction. Since high skill jobs already have high work pressure, this result suggests that work pressure may be reaching an upper limit for high skill workers. This result is also consistent with evidence reporting a progressive pervasiveness of symptoms related to job-strain in Scandinavian countries (Busck et al., 2010), which have been characterized by high levels of work pressure at least since 1995.

Whilst individual employers can do a great deal to improve working conditions, pressures from product and financial markets make it unlikely that the firms' goodwill can be relied upon to reverse the situation. Besides, the extent of work autonomy and work pressure is likely to reflect managerial culture at least as much as managerial constraints. Workplace policy

therefore needs to adopt a more interventionist stance since there is evidence that work-related public policies are effective in improving the quality of working life (Gallie, 2003; Esser and Olsen, 2011). Securing healthy psychosocial work environments should be a major public responsibility as their effects no doubt spill over to the whole society.

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Annex

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Table 1A – Definition of Variables

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WMSA – Work Method and Schedule Autonomy
Is the respondent able to choose or change his/her method of work? 1 – yes; 0 – no.
Is the respondent able to choose or change his/her speed or rate of work? 1 – yes; 0 – no.
Is the respondent able to choose or change his/her order of tasks? 1 – yes; 0 – no.
Is the respondent's pace of work dependent on the direct control of his/her boss? 1 – yes; 0 – no.
WCA – Work Criteria Autonomy
Does the respondent's main paid job involve assessing the quality of his/her own work? 1 – yes; 0 – no.
Does the respondent's main paid job involve learning new things? 1 – yes; 0 – no.
Does the respondent's main paid job involve resolving unforeseen problems on his/her own? 1 – yes; 0 – no.

Classification of occupations into skill levels

High-Skilled Clerical	Isco1 – Legislators, senior officials and managers
	Isco2 – Professionals
Low-Skilled Clerical	Isco3 – Technicians and associate professionals
	Isco4 – Clerks
	Isco5 – Service workers and shop and market sales workers
High-Skilled Manual	Isco6 – Skilled agricultural and fishery workers
	Isco7 – Craft and related trades workers
Low-Skilled Manual	Isco8 – Plant and machine operators and assemblers
	Isco9 – Elementary occupations
	Isco10 – Armed forces

Other variables

Work pressure: see Table 3A.

Satisfaction: Is the respondent satisfied with working conditions in his/her main paid job? 1– not at all, 2 – not very, 3 – satisfied, 4 – very satisfied.

Women: 1 – women and 0 – men.

Age: age of the respondent in years.

Year 2000: 1 – 2000 and 0 – otherwise.

Year 2005 and Year 2010: similar to Year 2000.

LSC: 1 if the respondent's job is low skill clerical and 0 otherwise.

HSM: 1 if the respondent's job is high skill manual and 0 otherwise.

LSM: 1 if the respondent's job is low skill manual and 0 otherwise.

Hours of work: Number of hours the respondent works per week in his/her main paid job.

Contract: 1 if the worker has an indefinite contract and 0 otherwise.

Wage: This question is related to the respondent's average net monthly income, after income tax and social security contributions, from his/her main paid job. This variable is organized in income bands, which differ from country to country. They correspond to a partition of the labor income distribution for each country in four groups. The first group contains the 25% of workers with the lowest income in each country and the fourth group includes the 25% of workers with the highest income.

Working hours fit: Do the respondent's working hours fit his/her family or social commitments outside work? 0 – not at all well, 1 – not very well, 2 – well, 3 – very well.

Workplace size: How many people in total work at the respondent's workplace (at the local site)? 1 : 1, 2: 2 to 4, 3: 5 to 9, 4: 10 to 49, 5: 50 to 99, 6: 100 to 249, 7: 250 to 499, 8: 500 and over.

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Table 2A – Variables: Summary statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
Satisfaction	59278	3.087	0.713	1	4
WMSA	59278	0.001	0.998	-2.049	1.447
WCA	59278	0.005	0.997	-2.667	1.177
Intensity	59278	0.0004	1.099	-2.301	2.943
HSC	59278	0.197	0.398	0	1
LSC	59278	0.454	0.497	0	1
HSM	59278	0.151	0.358	0	1
LSM	59278	0.196	0.397	0	1
Hours of work	59278	36.555	10.694	1	168
Contract	59278	0.810	0.391	0	1
Female	59278	0.454	0.497	0	1
Age	59278	39.067	110514	15	70
Wage	38607	2.453	1.080	1	4
Working hours fit	38607	3.114	0.788	1	4
Workplace size	38607	4.519	1.846	1	8
Year 1995	59278	0.207	0.405	0	1
Year 2000	59278	0.294	0.455	0	1
Year 2005	59278	0.196	0.397	0	1
Year 2010	59278	0.301	0.458	0	1
Agriculture	59278	0.022	0.148	0	1
Industry	59278	0.287	0.452	0	1
Services	59278	0.354	0.478	0	1
Public Administration	59278	0.086	0.280	0	1
Other services	59278	0.249	0.432	0	1

Table 3A. Distribution of Work intensity variables, by year

		1995	2000	2005	2010
q45a. Does your job involve working at very high speed?	Never	29.00%	26.60%	20.50%	20.00%
	Almost never	16.40%	17.30%	18.20%	17.70%
	Around 1/4 of the time	11.20%	11.60%	12.70%	13.80%
	Around half of the time	11.60%	12.10%	12.30%	14.10%
	Around 3/4 of the time	6.10%	7.40%	10.30%	10.90%
	Almost all of the time	14.30%	13.80%	15.70%	14.40%
	All of the time	11.40%	11.10%	10.30%	9.20%
q45b. Does your job involve working to tight deadlines?	Never	28.60%	23.10%	18.10%	17.80%
	Almost never	13.90%	16.90%	18.90%	17.60%
	Around 1/4 of the time	11.00%	11.70%	12.70%	13.90%
	Around half of the time	9.80%	10.90%	11.80%	13.70%
	Around 3/4 of the time	5.90%	8.10%	10.10%	9.90%
	Almost all of the time	14.30%	14.50%	15.10%	14.60%
	All of the time	16.40%	14.80%	13.30%	12.40%
q46a. Is your pace of work dependent on the work done by colleagues?	% yes responses	40.90%	47.10%	46.20%	43.30%
q46c. Is your pace of work dependent on numerical production/performance targets	% yes responses	36.40%	30.80%	44.40%	43.00%
q51g. You have enough time to get the job done (ordinal)	Always			38.20%	29.60%
	Most of the time			29.00%	43.50%
	Sometimes			19.50%	16.40%
	Rarely			7.90%	7.30%
	Never			5.40%	3.20%
q51g_01. You have enough time to get the job done (dichotomous)	% yes responses	77.10%	77.80%		

Table 4A – Means and number of valid cases for each autonomy question, by EWCS wave (the means correspond to the proportion of "yes" answers)

	1995	2000	2005	2010
Is your pace of work dependent on the direct control of your boss? (No=1)	0.596 (n=12378)	0.626 (n=17667)	0.606 (n=12136)	0.611 (n=18305)
Does your main paid job involve: assessing the quality of your own work? (Yes=1)	0.778 (n=12220)	0.739 (n=17586)	0.711 (n=12089)	0.732 (n=18387)
Does your main paid job involve: resolving unforeseen problems on your own? (Yes=1)	0.833 (n=12384)	0.810 (n=17733)	0.803 (n=12278)	0.815 (n=18561)
Does your main paid job involve: learning new things? (Yes=1)	0.766 (n=12403)	0.718 (n=17704)	0.704 (n=12230)	0.691 (n=18542)
Are you able to choose or change the order of your tasks? (Yes=1)	0.623 (n=12449)	0.607 (n=17786)	0.598 (n=12238)	0.630 (n=18507)
Are you able to choose or change your methods of work? (Yes=1)	0.693 (n=12424)	0.672 (n=17815)	0.649 (n=12238)	0.647 (n=18565)
Are you able to choose or change your speed or rate of work? (Yes=1)	0.698 (n=12391)	0.670 (n=17747)	0.653 (n=12180)	0.656 (n=18545)

Figure 1A. Levels and trends of Work Method and Scheduling Autonomy (standardized scores): a comparison of 15 EU countries.
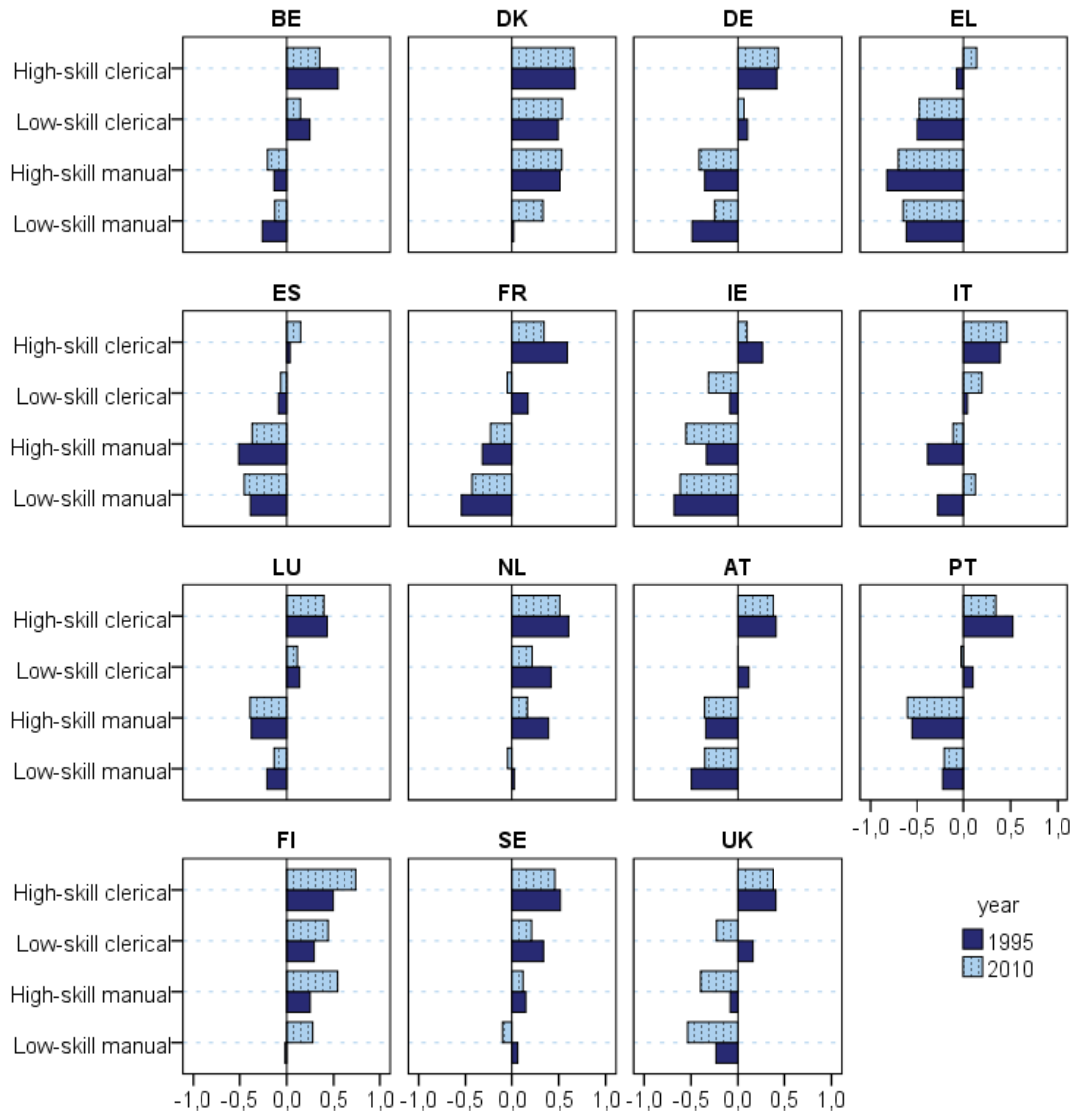
Note: Each bar represents the average Work method and scheduling autonomy (WMSA), per country and skill level. Due to the standardization of Global WMSA, a positive value represents an average autonomy level for the corresponding country, skill level and year above the overall average, whereas a negative value represents an average autonomy level below the overall average. For instance, in Belgium, WMSA is above the overall average in 1995 and 2010 for high and low skill clerical workers but has decreased during the period; WMSA has also decreased for high skill manual workers.

Source: Lopes et al (2012)

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Figure 2A. Levels and trends of work pressure (standardized scores): a comparison of 15 EU countries.