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Inequalities at work Job quality, Health and Low pay in European Workplaces

Elena Cottini, Claudio Lucifora

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Abstract

Using data from the two most recent waves of the European Working Conditions Survey we study inequalities in health, job quality and low pay in 15 European countries. Our health indicators refer to physical and mental health symptoms reported by the worker. A summary indicator of job quality is constructed using information on the working conditions experienced by the worker. Results show considerable differences within and between countries in the health status of workers, *ceteris paribus*. We show that bad jobs are correlated with adverse health conditions at work. We also show that specific cross-country features influence the relationship between job conditions and health problems, and that heterogeneity in job quality exists across countries.

JEL codes: I10, J41, J81.

Keywords: health, inequality, cross-country, job quality.

1. Introduction

Persistent differences in health by socioeconomic groups are one of the key issues facing many European countries (Jones and van Doorslaer, 2004), this has led to an increasing concern that equity in health in Europe may suffer as a result of the expansion of the European Union and the ageing of its populations. This is reflected in the recent commitment of Eu Member States to set up national action plans to contrast poverty and social exclusion (Hernandez-Quevedo et. al. 2006).

During the past decades economists have described an apparent increase in various measures of inequality (Garcia-Penalosa and Checchi, 2008). The changes in wage inequalities¹ have been explained in terms of differences in technologies, work organization, labor market institutions and intensified worldwide competition (OECD, 2008, Lucifora and Salverda 2009). As a result of increasing wage inequality the incidence of low-pay employment has become a matter of great concern in many industrialized economies. Recently, the European Commission also warned regarding the potential downsides of atypical forms of employment not only with respect to the level of pay but also in terms of job quality. Since the beginning of the European Employment Strategy in 1997, and the promotion of "flexicurity" policies within member states in recent decades, job quality has been considered one of the main aspects for the development of EU employment policy (Green, 2012). More recently, Europe 2020 foresees a strategy for sustainable growth that includes the promotion of job quality within its core guidelines. Increased understanding of the social and private costs generated by poor job quality has become of great concern among policy makers, while longer life expectancy has led to the conclusion that jobs will have to be of good quality if more workers are to be attracted to stay longer in the workforce. These changes, in terms of wage and nonwage components, are likely to have an impact on individual health conditions.

Economic theory predicts that under perfect information about job characteristics a wage differential is observed between workers facing good working conditions and workers facing bad working conditions at the workplace. In order to attract a workforce

¹ Among EU15 between 1994 and 2005 wage inequality rose to various extents in the UK, Netherlands, Germany, Finland, France and Sweden; while falling in Spain and Ireland (OECD Observer, June 2007).



of a given quality an employer offering jobs that are hazardous or undesirable must pay higher wages than employers offering jobs with more desired nonwage characteristics. Therefore an individual faces a set of jobs with different combinations of wage and non wage attributes. This means that workers might be equally attracted to a position with better working conditions and a lower wage. Following the theory of compensating differentials formalized by Rosen (1986) workers with the same level of competence should receive different wages if their working conditions are different; this means a negative correlation between wages and working conditions. Moreover an imbalance in terms of efforts and rewards² (Siegrist, 1996; 2002) might put workers into situations that could influence their health outcomes. As a consequence, an adverse work environment may damage workers' health or make it more difficult to search for jobs and more physically or mentally costly to work. In this context it is crucial to shed light on the health effects of both wage and non-wage aspects of a job.

Despite a large body of research that has investigated the extent of income inequality in a society, how this is related to individual's health remains a controversial issue. The existence of socioeconomic inequality in health is firmly established in the literature (see Adler et al., 1994; Van Doorslaer et al., 1997; Mackenbach et al., 2008; Smith, 1998, 1999; Van Doorslaer and Koolman, 2004). Most of this literature provides evidence of an inverse relationship between income and health. Epidemiological and occupational health literatures also present evidence for negative effects of both adverse physical and psychosocial working conditions on health (Amick et al. 2002; Borg and Kristensen, 2000). Some studies have analysed to what extent social class differences³ in health can be explained by work environment and lifestyle or environmental factors (Marmot, 1997; Power et al., 1998; Schrijvers et al., 1998; Toivanen and Hemstrom, 2006). In particular the Whitehall civil servant study has shown that after controlling for socio-economic status and conventional risk factors, psychosocial work characteristics can still act as a source of risk for a variety of health outcomes (Marmot and Rose, 1978; Holme et al., 1982; Kristensen, 1989a and 1989b; Fine, 2000). Other studies have focused on the effects of contractual provisions on individual well-being. Such evidence suggests that

² Where effort is intended as the demands of the job and the motivation of workers in challenging situations, and reward at work in terms of salary, esteem, job stability and available career opportunities.

³ Where social class is defined with proxies such as income, level of education or occupational grade.

more stressful and more insecure jobs are associated with poor mental health and lower satisfaction with life (Bardasi and Francesconi, 2004; Rodriguez, 2004).

Traditionally the economic literature on job quality has focused on wages, neglecting a large number of non-wage characteristics. Only recently, drawing on a long tradition of studies in sociology and psychology, economists started focusing attention on aspects of job quality, other than wages. These studies (for example Gallie et al., 1998; Green, 2006, Lehto and Sutela, 2005; Green, 2012; Cottini and Lucifora, 2012) examines specific aspects of job quality, such as insecurity or intensification of work, and on single country data; while a perspective over a range of countries and multiple domains of job quality is still lacking. We can conclude that economists so far have concentrated a lot of their attention on the study of inequalities, focusing largely on the wage component, but a job has many dimensions and we do not know much about how the different dimensions interact among themselves. The studies that are more similar to ours in terms of scope are: Robone, Jones and Rice (2008) that examine the impact of working and contractual conditions on self-assessed health and psychological well-being using data on UK, and Cottini (2010, 2012a, 2012b) who focus on the link between working conditions and health (both mental and physical) in an European context. Both studies find that adverse workplace attributes lead to a higher probability of reporting health problems at work. Finally, Serrano and Cabral (2005) examine the link between low pay and satisfaction with working conditions. They find a lower level of job satisfaction for low-pay workers and suggest the presence of a dual labor market in terms both of job quality and working conditions, showing that this is particularly pronounced in Southern European countries⁴.

This paper specifically looks at the link between health outcomes and job quality paying attention to the role played by low pay workers. We provide a descriptive piece that aims at showing within and between country differences in health, job quality and low pay. We do this by exploiting the most recent waves of the European Working Conditions Survey (EWCS) for the years 2005 and 2010. The information provided in the EWCS data can be compared across countries making it an attractive dataset for the purpose of our study. First we provide a descriptive section in which between and within country differences in terms of health, low pay and job quality are shown. We then move to a set of estimates that look at the effect of job quality and low pay on two indicators of

⁴ There is a wide literature that looks at the effect of labor flexibility on individual's health, such as for example Bardasi and Francesconi (2004) and Shields and Price (2005) to name a few.



health controlling for demographic characteristics, firm attributes, industry and occupation. Results show that, controlling for personal characteristics, bad job quality is always associated with poor health. Overall we find that job quality is an important determinant of health status and that health policies directed to workers should pay special attention to improving working attributes and pay. Fewer statistically significant effects are found with respect to low pay on health. Being low paid plays a marginal role, especially with respect to the mental health of workers. We also show that specific cross-country features influence the relationship between job conditions and health problems experienced by workers. The rest of the paper is structured as follows. Section 2 describes details of the data used and on the indicators of health at work and workplace attributes. Section 3 presents our empirical strategy while Section 4 shows results. Section 5 concludes.

2. Data description and stylised facts

We decided to focus on the two most recent waves of EWCS because they contain more accurate information on income. The survey is particularly rich in terms of information on individual demographics, mental and physical work-related health, as well as working and contractual conditions. We concentrate our analysis on EU15 countries: Greece, Sweden, Italy, Finland, Luxemburg, France, Portugal, Belgium, Spain, Denmark, United Kingdom, Germany, Netherlands, Austria and Ireland. In this paper we focus on the link between three variables of interest: health problems experienced by workers, low pay and job quality at the workplace as reported by the worker.

The index of physical and mental health problems is defined on the basis of a question asking which symptoms were suffered by the workers among: skin problems; respiratory difficulties; stomach-ache; heart disease; depression, anxiety and sleeping problems⁵. Out of the above responses we construct a set of dummies that take value 1 if the worker mentions the problem and 0 if the problem has not been mentioned. For example individuals were classified as reporting “skin problems” if they answered that they were suffering from “skin problems” as one of the symptoms among a checklist of several options. Using all the specific health variables, we construct two indicators of health. First is a dummy variable that measures the occurrence of the physical health problems, we construct an indicator that takes value 1 if a physical health problem has been mentioned, meaning symptoms including skin problems, respiratory difficulties, stomach-ache and heart disease. We replicate the same procedure to measure mental health problems, and construct a dummy variable that takes value 1 if any mental health problem has been mentioned by the worker, meaning depression, sleeping problems or anxiety. To construct our dependent variables, similarly to the literature in this field, we use self-assessed indicators of health which have been shown to capture important information about the

⁵ Note that the exact wording of the question related to self-reported health at work has been changed in the 2010 wave, with respect to previous waves. The main difference is that in 2010 workers are not requested to report their health symptoms referring directly to the effect of their work but the question about symptoms is asked with respect to their general health status over the last 12 months. (Health Question in 1995-2005: “Q33 Does your work affect your health, or not?” (Yes/No) and “Q33A How does it affect your health?”. - Health Question in 2010: “Q67 Does your work affect your health, or not?” and “Q69 Over the last 12 months, did you suffer from any of the following health problems?”). Although there is information about work affecting health the causal relationship of symptoms with work is not explicitly asked. The information is less precise and only a limited number of symptoms is asked in both waves, although we were able to construct an indicator containing symptoms present in both waves.



person's health (Idler and Kasl, 1991; Idler and Benyamini, 1997) and be a predictor of mortality risk.

Next, we construct a summary indicator of job quality which comprises both psychosocial and physical hazards experienced by the worker at the workplace. To select variables with psychosocial content we focus on the existing occupational health literature, and we basically rely on the “demand-control-support” model developed by Karasek (1990) and Karasek and Theorell (1990) and the “effort imbalance model” of Siegrist (1992) and Siegrist (1996). Consequently, we use 6 dummy variables capturing high intensity of work, high complexity of tasks, no assistance from colleagues, low job autonomy in performing tasks, shift work and working long hours⁶. Second we are also able to use a set of variables describing exposure to physical hazards. More specifically we create a set of 5 dummy variables that take value 1 if the worker was exposed from half of the time to all of the time to: vibrations from hand tools; or noise so loud that he/she has to raise his/her voice to talk with other people; or high temperature, coldness (work outdoor or in cold rooms); or repetitive arm movement; otherwise. In order to analyse the impact of all psychosocial and physical hazards together we construct a summary measure of the overall job quality reported by the worker in the firm he has worked. To facilitate comparisons with previous works, we decided to keep a single index of working conditions. This might be justified from a pure theoretical perspective in economics, whereby there is assumed to be a utility associated with each job, and a single job quality index would then be seen as measuring such utility. This general indicator of job quality is constructed as the sum of the dummy variables describing psychosocial and physical hazards, thus it takes values from 0 to 11, with 0 referring to good job quality as reported by the worker and 11 as bad job quality⁷. We also control for the worker having or not a permanent contract.

Our third variable of interest consists in a measure of income inequality. In order to facilitate comparison with previous empirical studies, and to be consistent across waves, as an indicator of income inequality we use a low-pay dummy defined as those workers whose earnings fall below two third of the median of the individual income distribution as reported by the worker (Lucifora and Salverda, 2009). This variable is computed by the

⁶ This indicator is defined as working more than 40 hours a week.

⁷ We also experimented constructing an indicator of working conditions using a different method, such as principal component analysis. Results are basically unchanged and are available upon request.

authors from EWCS for each single country and year included in the analysis. We use only full time workers in this analysis⁸.

Further to the above, we include a set of controls for individual and work characteristics, such as gender, 5 age group dummies, marital status for married or living in couple, and the presence of children in the household. 3 Educational dummies are created from the ISCED classification. Finally we control for a set of workplace and firm attributes that include dummies for firm's size, sector and type of occupation, and for country and year fixed effects.

2.1 Descriptive Statistics

In Figure 1, we compare the measures capturing health problems experienced by workers across 15 European countries⁹ with our job quality measure. In general we detect significant differences across countries. The ranking of countries with respect to reporting mental health problems (dots in blue) shows Greece, Sweden and Finland at the top of the chart, while Ireland, Germany and UK are located at the opposite end. When we move to physical health¹⁰ (dots in red) the ranking is substantially unchanged at the top of the chart with Sweden, Finland, Italy (instead of Greece reporting the highest incidence, while at the lower end of the chart together with Ireland and Germany we find also Spain and Portugal¹¹).

⁸ Although we have some information on number of hours worked this resulted low in precision we decided to focus only on full time workers and to exclude part timers from the sample.

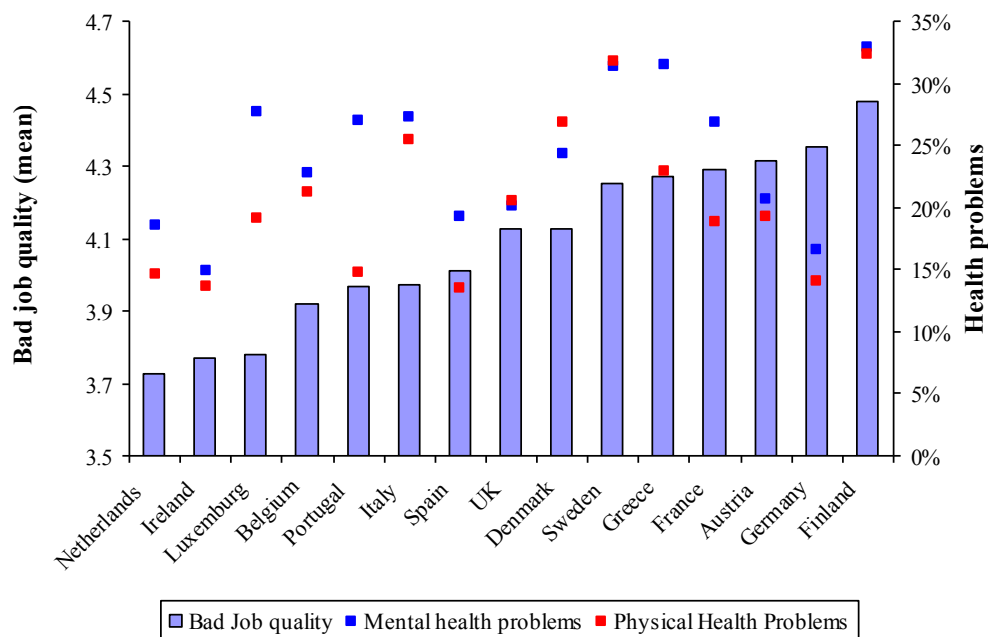
⁹ In all the Figures used in this section we use pooled data for the waves of EWCS for 2005 and for 2010, this means that the values reported are averages for two points in time.

¹⁰ Since these indicators are simple (unconditional) averages, as a further check, we also computed the ranking retaining the estimated country fixed effects after controlling for a set of workforce demographic characteristics. The ranking we obtain in this way is essentially unchanged, while some of the differences appear even larger (i.e. Greece). Results are available upon request from the authors.

¹¹ In Table A2 in the Appendix we report means for job quality, health indicators and low pay across countries.



Figure 1: Job quality and health between countries

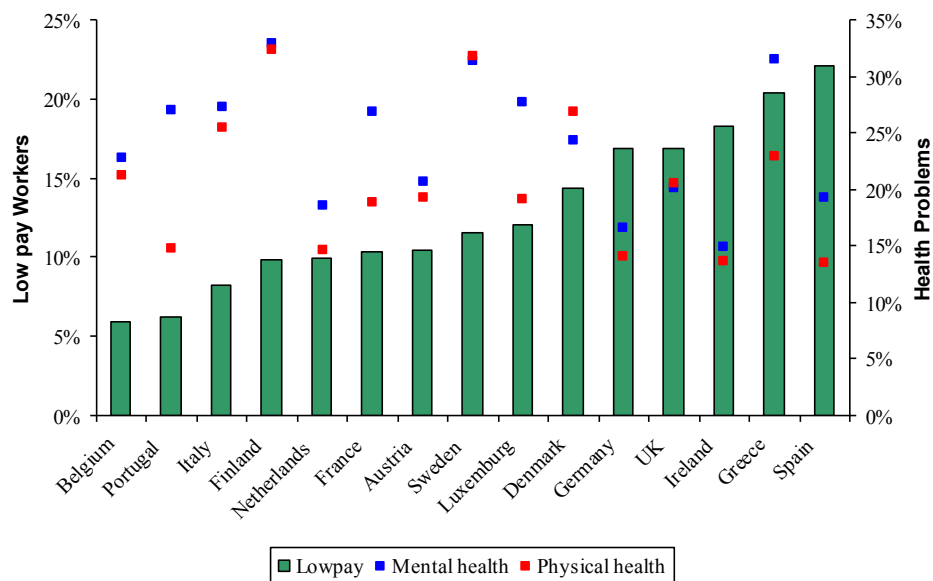


Countries that report, on average, worse job quality (histogram in blue) are Finland, Austria and Germany, while better job quality is found in Ireland, the Netherlands and Luxemburg. Note that Germany and Austria show a very high ranking in terms of average bad job quality. An explanation of this result could be found in the fact that countries like Germany show very low (on average) levels of physical hazards as reported by Green et al. (2012). We can conclude that the extent of these problems seems to vary across countries considerably, and this could be also influenced by the legal and social protection mechanisms for worker's health and safety. Although in this paper we decided to keep a single indicator of job quality we leave for further investigation an accurate distinction between dimensions of job quality.

It is clear that these rankings can only partly be considered as a reflection of a high standard of living, as measured by GDP per capita for example, however it should be underlined that these simple descriptive statistics show substantial heterogeneity in terms of quality of jobs across countries. We aim at providing alternative explanations, based on institutional characteristics that might justify such differences in a future extension to this work. Moreover, in some cases we see that where health problems are highest (especially with respect to mental health) also bad job quality is reported to be highest. This is for example the case of Finland and Greece, and France to some extent.

In Figure 2 we compare health problems with the share of low pay calculated for each country in our sample. Our statistics of low pay workers are in line with numbers found elsewhere from different sources (Lucifora et al. 2005). Spain, Greece, Ireland and UK show the highest shares of low pay workers (with values ranging from 22% in Spain, 20% in Greece, 18% in Ireland and 17% in UK) while Belgium and Portugal rank among the lowest (with 6% and 7% respectively). High variation is found in terms of the share of low pay workers across countries. No clear pattern of correlation seem to be evident to justify a positive relationship between share of low pay and job quality. Previous works found evidence in support of a nonlinear relationship between low pay and workers health (Cottini, 2012).

Figure 2: Income inequality and health between countries



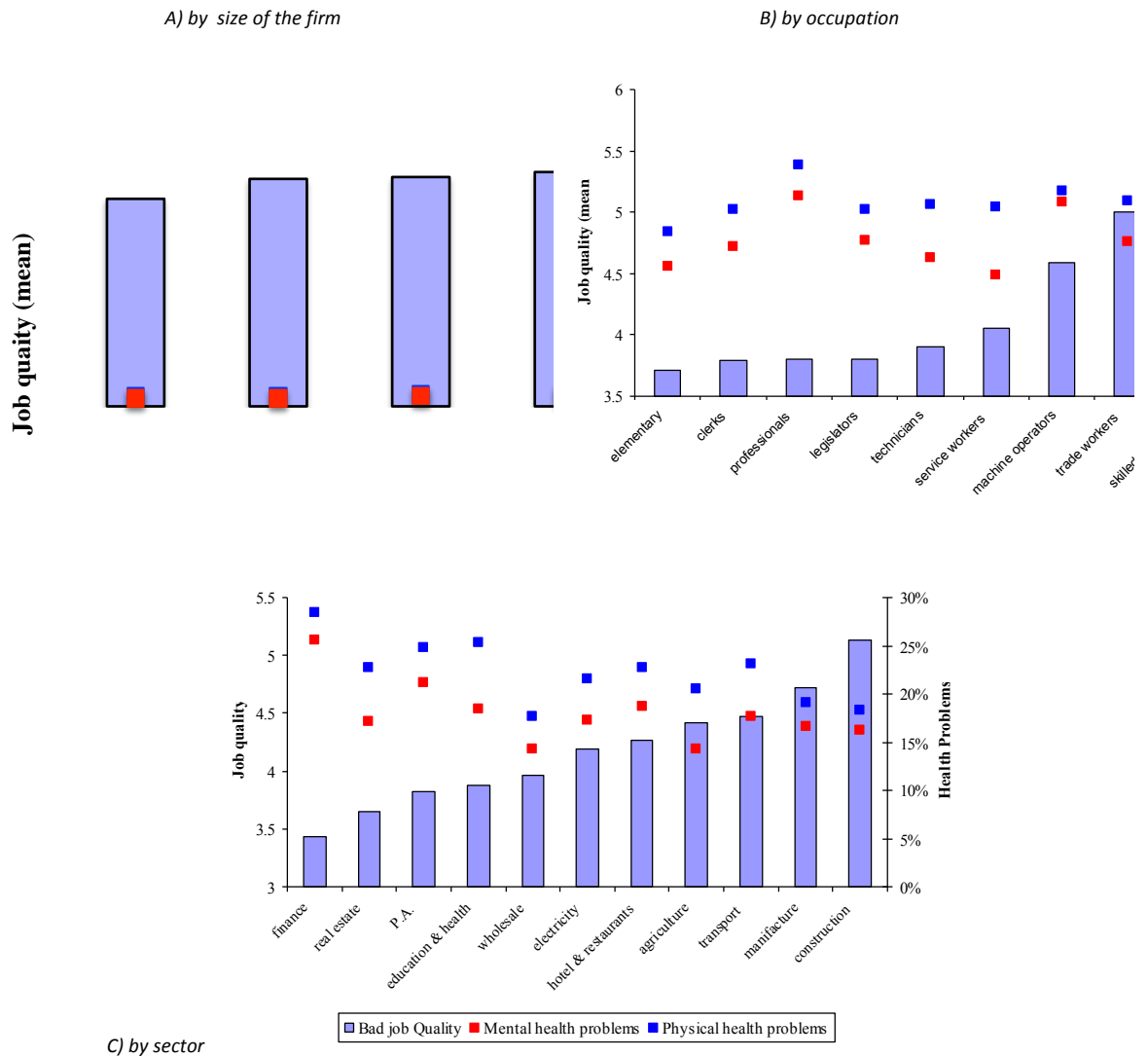
Very limited evidence is available on how job quality is distributed over the labour force in the economy. In Figure 3 we report some descriptive statistics with respect to the levels of job quality by firm size, occupation and sector (panel A, B and C respectively). The aim of this descriptive exercise is to show a picture of which groups experience better, or worse, job quality, according to the job quality index that we constructed and which are the levels of health problems experienced in each subgroup. Consequently, job quality is contrasted with health problems (mental and physical) experienced by workers. Panel A shows how job quality varies across establishments of different sizes, as measured by the



numbers of employees. No clear pattern is identified in the literature with respect to job quality and firm size, while it is commonly found that wages increase with firm size and with establishment size, one possible explanation is that low wages in smaller establishments are compensated by other job features that might be better than in larger establishments. With respect to our data we find that job quality is worse in bigger firms, also health problems (on average) increase with firm size. This is true particularly for mental health. It should be kept in mind that these effects might be obscured by the fact that we are using a general indicator of working conditions thus we are not able to capture how single factors might interact in shaping this relationship. When it comes to occupation, as shown in panel B of Figure 3, skilled agricultural workers and trade workers show worse levels of job quality, while clerks, professionals and legislators show the lowest levels of adversity in terms of working conditions. Some caution should be used in interpreting these statistics since different aspects of job quality, like for instance job complexity versus physical hazards could play differently across occupations (Green et al., 2012). No substantial difference is evident by health problems, apart that service workers show the highest levels of mental health problems.

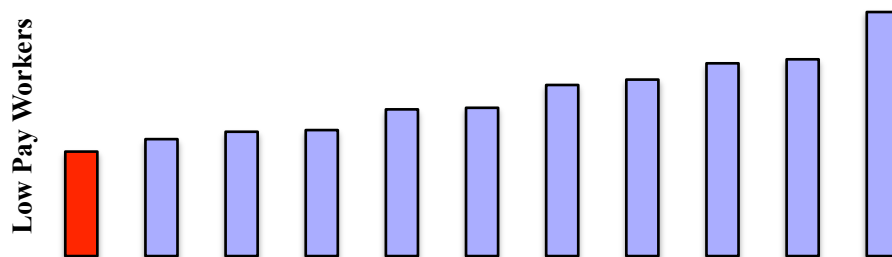
Panel C of Figure 3 shows how our index of job quality varies across sectors. The construction sector reports the highest level of exposure to each set of risks, with the agriculture and manufacturing sectors also reporting highest exposure. The financial intermediation and real estate sectors are those in which the lowest exposure is reported for our indicators of job quality while the highest levels of health problems are on average shown. This is somehow counterintuitive, but it should be kept in mind that the statistics are unconditional thus they could show spurious correlations. Previous studies on different aspects of job quality in Europe have found considerable variation across countries (European Commission, 2008; Gallie, 2007). As we have shown above, the job quality indices vary considerably across industries, differences between countries might emerge as a result of this varying industrial composition, rather than because of differences within the same industries.

Figure 3: Within health differences across sectors, occupations and by firm size.



So far we did not present detailed information about the composition of the low pay workforce. In Figure 4 we present how low pay employment is distributed over the labour force with respect to a number of groups of employees, ranging from female workers to young workers and for certain job characteristics such as sector, size of the firm and type of contract. In red we report the average percentage of low pay workers present in our sample (12 percent).

Figure 4: Incidence of Low Pay by selected categories



First, it is clear that the highest incidence of low pay is found among young people and unskilled workers, while the low paying industries are agriculture, hotels and restaurants and retail. This is in line with previous statistics on the topic (Lucifora et al. 2005).

3. Empirical Analysis

The empirical strategy consists of regressing different indicators of health problems onto a composite index of job quality, a dummy variable identifying low pay workers and a vector of common predictors such as individual and firm characteristics. Individual characteristics include gender, age (in 5 classes), education, civil status and a dummy describing presence of children in the household; while job and firm characteristics include 11 sectors, 9 occupations, type of contract and 5 firm size dummies. All specifications used in the paper include country fixed effects and year dummies.

Given the dichotomic nature of our dependent variable we estimate a series of probit models and for ease of interpretation we always report marginal effects evaluated at sample means in all tables of results. Results are reported for the entire sample - pooling countries and data points – in Table 1 and Table 2. Next we test the robustness of our results performing a series of probits by subgroups according to demographic characteristics; this is informative with respect to heterogeneous effects that cannot be otherwise captured by our baseline specification. These results are reported in Table 3. Finally, in Table 4, we also perform regressions by clusters of countries according to standard classifications of welfare regimes.

We first present results for mental health problems in Table 1. Model 1 presents estimates that control only for our indicator of bad job quality and a low pay dummy and country and time fixed effects. Model 2 augments this specification by demographic characteristics while in Model 3 we include also firm and occupational characteristics.

When we estimate our model only including our variables of interest, job quality and low pay and control for country and time fixed effects we find that experiencing bad quality of the job increases the probability of suffering from a mental health problem by 2 percentage points, while being low paid is positively correlated with mental health problems but does not show any statistical significant effect (Model 1). These results are in line with the empirical evidence from previous studies showing that adverse working conditions have negative effects on health (Karasek 1990; Karasek and Theorell, 1990), while it does not show any significant effect for low pay workers.

In Model 2 we augment our specification with demographic characteristics, and find that results are substantially unchanged with respect to the variables job quality and low pay. Even if our focus, in this paper, is on the correlation between health problems, working conditions and low pay we briefly discuss also results of demographic and firm characteristics. Being

female is positively correlated with mental health problems, and increases the probability of experiencing mental health problems by nearly 3 percentage points. Age dummies show a positive relationship with our indicator of mental health experienced by workers; that is younger workers generally report a lower probability of suffering from mental health problems compared to older workers. So health deteriorates as age passes. In line with the literature on the relationship between health and education (for example in Kemna, 1987), higher education is positively correlated with mental health problems. More educated workers show 4 percentage points higher probability of experiencing mental health problems. This might be due for example to occupational choices (choosing occupations with relatively higher occupational hazards in terms of intensity of work for example). Living in a couple (or being married) is associated with better mental health of individuals, while having children increases the probability of reporting mental health problems. Studies that have focused on marital-status show those differences in well-being among men and women are found regardless of gender; married people enjoy better mental health than unmarried (Waite, 1995; Waite and Gallagher, 2000). In our sample this effect seems to be confirmed.

Variables controlling for workplace attributes (in Model 3) show that the probability of experiencing mental health problems increases with the size of the firm, while the effect is highest, *ceteris paribus*, for the financial sector (7.5 percentage points increase) compared to the reference category¹². This is in line with our descriptive statistics shown in the previous section. In line with existing literature holding a permanent position relative to a temporary position is not statistically significantly different with respect to mental health problems (Francesconi and Bardasi, 2004).

Table 1: Mental health, job quality and low pay

<i>Dep.var: Mental Health problems</i>	<i>Model 1</i>		<i>Model 2</i>		<i>Model 3</i>	
	<i>Marg.eff</i>		<i>Marg.eff</i>		<i>Marg.eff</i>	
Index of Job quality	0.021	***	0.024	***	0.026	***
Low Pay	0.005		0.014		0.011	
<i>Demographics</i>						

¹² Our excluded category is Agriculture.

Female			0.027	***	0.021	***
age2635			0.036	***	0.044	***
age3645			0.058	***	0.068	***
age4664			0.092	***	0.099	***
educmid			-0.006		-0.007	
educhigh			0.042	***	0.023	***
couple			-0.021	***	-0.02	***
child			0.022	***	0.019	***
<i>Firm Characteristics</i>						
Fsize 10-50					0.007	
Fsize 51-250					0.028	***
Fsize over 250					0.133	***
Manufacturing					-0.043	
Electricity and water					-0.005	
Construction					-0.036	
Wholesale, retail trade					-0.016	
Hotel and restaurants					0.024	
Transport					-0.024	
Financial sector					0.075	***
Real estate					0.008	
Public administration					-0.011	
Other services					0.02	
Legislator					-0.028	***
Professionals					-0.026	***
Technicians					-0.04	***

Clerks					-0.042	***
Service workers					-0.044	***
Skilled agriculture					0.004	
Craft and related trade					-0.017	
Machine operators					-0.032	***
Permanent contract					-0.014	
Nobs	34312		34312		34312	
Log-lik	-17206.6		-17042.2		-16902	

Note: In all Models we also control for country and time fixed effects. Reference categories are: age below 25, low level of education, Firm size below 10, Agricultural sector and elementary occupations. Marginal effects are reported calculated at the mean of independent variables.

In Table 2 we report the results obtained from the estimation of the physical health equation. Results for demographic and workplace attributes confirm the conclusions outlined for mental health, with some interesting differences. For example, being female does not show a statistically significant effect with respect to the probability of suffering from physical health problems, while also a high level of education does not show any statistically significant result. Looking at the industry dummies, workers of the Electricity, Hotel and Restaurant and Construction sectors show highest marginal effects (ranging from 7 percentage points increase to 3 percentage points increase) with respect to Agriculture. Finally, with concern to job quality, results confirm their relevance for work-related health problems; while contrary to results obtained with respect to mental health being low paid does matter for the physical health of workers. The low pay dummy is likely to capture a deprivation effect which may impact more on the physical health of the individual rather than on their mental health. The effect of income deprivation on specific health problems has been found elsewhere with respect to different health outcomes. In a study of young black men, Kapuku et al (2002) reports that low income is associated with diastolic blood pressure. Marmot et al (1997, 2006) show that decreasing socio economic status implies greater physical and mental ill health and mortality. In our study these findings are confirmed with respect to physical health only. Moreover, one could argue that as individuals with poor health, value their health highly at the margin therefore have incentives to avoid unhealthy work, the workers who are most

likely to quit a hazardous job are those mostly affected by the hazard. In equilibrium the result is that relatively healthy workers remain in the more hazardous occupations. This is what has been called in the epidemiological literature “healthy worker effect”. One shortcoming of our paper is that we lack to control for sorting of workers into occupations and into low pay status. However recent papers (Cottini, 2012; Cottini and Lucifora, 2013) have taken this issue into account and found evidence of a causal effect of working conditions on health (both mental and physical dimension), suggesting that failing to control for the endogeneity of job quality and low pay in an health equation generates a downward bias of the coefficient of interest.

We can conclude that the indicator of working conditions shows a positive and statistically significant association with health problems experienced by workers in European countries, suggesting that worse working conditions are associated with a higher probability of reporting any type of health problems. No clear effect is found with respect to low pay (as also in Cottini, 2012). Finally we should notice also some differences in terms of magnitude of marginal effects: the effect of working conditions on physical health presents marginal effects that are between 1.7 and 1.9 percentage points, while in the case of mental health were between 2.1 and 2.6 percentage points. So job quality shows a bigger adverse impact on the mental health of workers.

Table 2: Physical Health, job quality and low pay

<i>Dep.var: Physical Health problems</i>	<i>Model 1</i>		<i>Model 2</i>		<i>Model 3</i>	
	<i>Marg.eff</i>		<i>Marg.eff</i>		<i>Marg.eff</i>	
Index of Job quality	0.017	***	0.018	***	0.019	***
Low Pay	0.027	***	0.032	***	0.028	***
Female			0.011	***	0.007	
Age2635			0.036	***	0.034	***
Age3645			0.024	***	0.022	***
Age4664			0.066	***	0.06	***
Educmid			0.019	***	0.015	***

Educhigh			0.012		0	
Couple			-0.008		-0.005	
Child			0.002		-0.002	
Fsize 10-50					0.042	***
Fsize 51-250					0.028	***
Fsize over250					0.134	***
Manufacturing					0.026	
Electricity and water					0.068	***
Construction					0.031	
Wholesale, retail trade					0.028	
Hotel and restaurants					0.043	*
Transport					0.012	
Financial sector					0.17	***
Real estate					0.05	*
Public administration					0.052	***
Other services					0.079	***
Legislator					-0.022	*
Professionals					-0.022	
Technicians					-0.003	
Clerks					0.029	
Service workers					-0.028	
Skilled agriculture					0.02	
Craft and related trade					0.022	
Machine operators					0	
Permanent contract					-0.013	

Nobs	34312		34312		34312	
Log-lik	-15280.5		-15221.03		-15059.9	

Note: In all Models we also control for country and time fixed effects. Reference categories are: age below 25, low level of education, Firm size below 10, Agricultural sector and elementary occupations. Marginal effects are reported calculated at the mean of independent variables.

In the descriptive analysis in Section 2 we underlined some unconditional observed heterogeneity across selected workforce groups in both mental health and physical health. In other words, since workers in any job typically combine more than one adverse feature in terms of job quality and low pay, referring to specific sectors or occupations could provides an indication of the health risks faced by workers at the workplace. In order to explore heterogeneous effects of job quality and low pay on health, in Table 3 we estimate our preferred specification (column 3 in Table 1) separately by: firm size (big versus small firms), occupation (white and blue collars) and sector (primary, secondary and tertiary). In this Table we report only marginal effects of our key variables of interest: low pay and job quality. In general, the overall pattern is confirmed. Results show that the adverse effects of bad job quality on health (both mental and physical) are maintained for all subsamples.

It's worth noticing that working in a big firm, being white collar and working in the primary sector show highest percentage points increases in mental health problems compared to working in small firms, being blue collar and working in the secondary and tertiary sector.

This results is not surprising since it tells us that a higher probability of facing mental health problems are faced by workers with presumably more responsibilities (white collars) and working in more risky sectors (agriculture and energy). In this sense, less clear differences are instead found with respect to physical health.

Low pay in most cases is not statistically significant for mental health (as already seen for the whole sample) while it keep its statistically significant effect for physical health. The effects of job quality on mental health problems range between 2.1 percentage points (for blue collars) to 4.1 percentage points (for the primary sector of activity). With respect to the physical health equation we notice that the variable low pay while maintaining the correct sign loses significance for the subsample of blue collars. This could indicate less precision in the estimates for some subsamples or that the deprivation effect is less relevant (for physical health matters) for some sub groups of workers. The effect of working conditions ranges between 1.5 and 2.6 percentage points, being highest for the group of workers in the primary sector (that consists in Agriculture and Energy industries). These results call attention towards

those workers who appear to be more vulnerable to the changing working conditions, intended as both monetary and non monetary.

Table 3: Health Problems, Job quality and low pay by subgroups

Dep.var:	Big firm (fsize>50)		Small firm		White collar		Blue collar		Primary sector		Secondary sector		Tertiary sector	
	Marg.e ffect	Sta.s ign	Marg.e ffect	Sta.s ign	Marg.e ffect	Sta.s ign	Marg.e ffect	Sta.s ign	Marg.e ffect	Sta.s ign	Marg.e ffect	Sta.s ign	Marg.e ffect	Sta.s ign
<u>Mental Health problems</u>														
Index of Job quality	0.028	***	0.023	***	0.031	***	0.021	***	0.041	***	0.028	***	0.023	***
Low Pay	-0.026		0.024	***	0.009		0.007		0.05		0.008	***	0.009	
Log-lik	- 4124.4		- 12589.		- 9555.1		- 7198.5		- 588.36		- 11343.		- 6259.8	
<u>Physical problems</u>														
Index of Job quality	0.019	***	0.018	***	0.022	***	0.017	***	0.026	***	0.023	***	0.015	***
Low Pay	0.043	***	0.024	***	0.027	***	0.016		0.098	***	0.024	***	0.039	***
Log-lik	- 3444.1		- 11529.		- 8268.4		- 501.22		- 501.22		- 10042.		- 5605.6	
Nobs	8222		26090		19273		15039		1499		22014		13797	

Note: In all Models we also control for country and time fixed effects, demographic and firm characteristics. Reference categories are: age below 25, low level of education, Firm size 1-4, Agricultural sector and elementary occupations. Marginal effects are reported calculated at the mean of independent variables.

There are also different perspectives as to whether job quality trends are similar in many countries, or whether national differences in regulations and in labor market institutions have induced different paths of advancement in job quality. Discovering different paths of job quality and how these are related to health provides a useful test of the importance of country-level institutions. In all previous estimates, the link between working conditions and health outcomes was constrained to be the same across all countries, and the information about cross countries differences could solely be derived from the country fixed effects (not reported)

with respect to the outcome variable, while it could be useful also to discuss differences across countries in terms of, for example, the low pay variable or the job quality indicator. For this purposes it becomes valuable to think in terms of clusters of countries, thus in Table 4 we present the results for our preferred specification (presented in column 3 of the previous Tables) for 4 groups of countries.

To classify the countries included in our sample we use the standard classification outlined by Esping-Andersen (1990). This consists of: 1) the ‘social-democratic’ regime type, characterised by high levels of state support and an emphasis on the individual rather than the family, typified by the Scandinavian countries and the Netherlands, 2) the ‘conservative’ regime type, characterised by an emphasis on insurance-based benefits providing support for the family rather than the individual, and typified by the continental European states of France, Germany, Austria, Belgium and Luxembourg. 3) the ‘liberal’ group of welfare states typified by a modest level of welfare state provision and a reliance on means-tested benefits, exemplified by the UK and Ireland. Ferrera (1996) proposes the addition of a fourth category for the Southern European countries which were excluded in Esping-Andersen’s original typology: 4) a ‘Southern’ group of ‘residual’ welfare states, typified by low levels of welfare provision, and a reliance on the family as a locus of support – here, typified by Italy, Spain, Portugal and Greece.

First, the low pay dummy is never statistically significant, except in the case of Social Democratic countries for physical health, we can conclude that there is no clear effect of being low paid on health once we disaggregate the sample. This could capture a deprivation effect of being low pay, which is likely to be more important for workers in Socio Democratic countries where fewer of them are found in low pay jobs, as can be seen also in Figure 2. Second the effect of bad job quality remains positive and strongly statistically significant in all the subsamples. Highest effects are found with respect to Social Democratic Countries (3.5 point percentage increase for mental health and 2.5 for physical health) and Southern European countries (2.6 point percentage for mental health only). For example, in the case of Social Democratic Countries, this means that that one standard deviation increase from the mean in the job quality index results in a 7.2 increase in the predicted probability of experiencing mental health problems, while results in a 5.0 increase in the predicted probability of experiencing physical health problems. In Continental and Liberal countries these effects are lower: 2.3 and 2.1 point percentage respectively.

One explanation is that in countries where health and safety standards are higher, such as Nordic countries, and where the labour market is characterized by stringent regulations this

may impact on workers in different ways. First, insiders may have to face more stressful working conditions to satisfy firm's performance requirements, while the outsiders may bear most of the adjustment costs in terms of bad job quality, job mismatch and precarious contractual provisions. Comparisons across countries should be interpreted with care, but the content of Table 4 could be informative with respect to the relevance of welfare systems and institutional characteristics that may impact on the relationship between job quality, income and health.

Table 4: Health Problems, job quality and low pay by clusters of countries

Dep.var:	<i>(1)</i>		<i>(2)</i>		<i>(3)</i>		<i>(4)</i>	
<i>Mental Health problems</i>	<i>SOUTHERN</i>		<i>LIBERAL</i>		<i>CONTINENTAL</i>		<i>SOCIAL-DEMO</i>	
Index of Job quality	0.026	***	0.021	***	0.023	***	0.035	***
Low Pay	0.02		0.001		-0.013		0.032	
Log-lik	-4409.5		-1495.6		-7306.2			
<i>Physical Health problems</i>								
Index of Job quality	0.017	***	0.019	***	0.018	***	0.025	***
Low Pay	0.026		0.028		0.018		0.033	*
Log-lik	-4065.91		-1536.5		-6159.5		-3089.1	
Nobs	9006		3173		15473		6660	

Note: Note: In all Models we also control for country and time fixed effects, demographic and firm characteristics. Reference categories are: age below 25, low level of education, Firm size tra 1 e 4, Agricultural sector and elementary occupations. Marginal effects are reported calculated at the mean of independent variables.

Conclusion

This paper investigated the relationship between health at work, working conditions and income inequality in 15 European countries, using the 2005 and 2010 waves of the EWCS data. We have first documented health patterns at the workplace, then we investigated the relationship between working conditions and low pay with (mental and physical) health at work. Our results show that, controlling for a wide range of personal and job attributes, bad job quality is associated with more work related health problems – both physical and mental. In particular we find higher marginal effects of working conditions on the mental health of individuals. We also find evidence in favour of an effect of being low paid but that is statistically significant only for the physical health of individuals.

Heterogeneity in terms of socio-economic groups and countries is also found, this calls attention towards those workers who appear to be more vulnerable to the changing working conditions. However this study presents some limitations. Given the number of countries included in the analysis only cross sectional data are available, also the comparison of self assessed indicators of subjective health outcomes across countries can be plagued by response scale bias moreover. This refers to the fact that questions on well being might have different meaning to different people, thus individuals with different characteristics and experiences are prone to answer in a different way to the same question. Unfortunately we are not able to tackle these issues in this context. Another shortcoming refers to the endogeneity of job quality and low pay which has not been properly addressed in this paper.

Policy implication related to the findings of this paper reside in different domains. First, improving the health (both physical and mental) of workers by increasing the quality of jobs is correctly perceived as a priority, especially in terms of cost-effectiveness since health problems experienced by workers have become a major source of public spending in most European countries. Second, in terms of efficiency, workers in good health are likely to be more satisfied with their job and consequently more productive.



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Tables and Data Appendix
Table A1 – Characteristics of the Sample

	<i>Full sample</i>		
<i>Dependent variables</i>	0.25	Firm size over 250	0.06
Mental health problems	0.20	Agriculture	0.03
Physical health problems		Manufacturing	0.16
Job quality	4.07	Electricity, gas and water	0.01
Low pay	0.12	Construction	0.08
<i>Demographics</i>		Wholesale and retail trade	0.15
Female	0.47	Hotel and restaurants	0.04
Age less than 26	0.12	Transport and communication	0.07
Age between 26 and 35	0.23	Financial intermediation	0.04
Age between 36 and 45	0.29	Real estate	0.08
Age between 46 and 64	0.35	Public administration	0.07
Low level of education	0.29	Other services	0.27
Middle level of education	0.33	Legislator	0.08
High level of education	0.38	Professionals	0.11
Being in a couple	0.63	Technicians	0.18
Have a child	0.47	Clerks	0.13
Have a Permanent contract	0.70	Service workers	0.13
<i>Firm Characteristics</i>		Skilled agriculture	0.02
Firm size between 1 and 10	0.35	Craft and related trade	0.14
Firm size between 10 and 50	0.32	Plant and machine operators	0.07
Firm size between 51 and 250	0.22	Elementary occupation	0.13



Table A2. Incidence of health problems, low pay and bad job quality

<i>Country</i>	<i>Physical health problems</i>	<i>Mental health problems</i>	<i>Lowpay</i>	<i>WC</i>
Spain	0.122	0.197	0.221	3.969
Ireland	0.132	0.174	0.183	3.713
Netherlands	0.147	0.219	0.100	3.672
Portugal	0.152	0.274	0.062	3.937
Germany	0.163	0.163	0.168	4.371
Austria	0.176	0.204	0.105	4.155
Luxemburg	0.204	0.289	0.121	3.847
UK	0.207	0.198	0.169	4.084
France	0.219	0.305	0.103	4.374
Belgium	0.237	0.234	0.060	4.087
Greece	0.255	0.362	0.204	4.295
Denmark	0.284	0.268	0.143	4.093
Finland	0.294	0.324	0.099	4.427
Italy	0.304	0.322	0.082	3.765
Sweden	0.322	0.325	0.116	3.994

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Information on the GINI project

Aims

The core objective of GINI is to deliver important new answers to questions of great interest to European societies: What are the social, cultural and political impacts that increasing inequalities in income, wealth and education may have? For the answers, GINI combines an interdisciplinary analysis that draws on economics, sociology, political science and health studies, with improved methodologies, uniform measurement, wide country coverage, a clear policy dimension and broad dissemination.

Methodologically, GINI aims to:

- exploit differences between and within 29 countries in inequality levels and trends for understanding the impacts and teasing out implications for policy and institutions,
- elaborate on the effects of both individual distributional positions and aggregate inequalities, and
- allow for feedback from impacts to inequality in a two-way causality approach.

The project operates in a framework of policy-oriented debate and international comparisons across all EU countries (except Cyprus and Malta), the USA, Japan, Canada and Australia.

Inequality Impacts and Analysis

Social impacts of inequality include educational access and achievement, individual employment opportunities and labour market behaviour, household joblessness, living standards and deprivation, family and household formation/breakdown, housing and intergenerational social mobility, individual health and life expectancy, and social cohesion versus polarisation. Underlying long-term trends, the economic cycle and the current financial and economic crisis will be incorporated. Politico-cultural impacts investigated are: Do increasing income/educational inequalities widen cultural and political 'distances', alienating people from politics, globalisation and European integration? Do they affect individuals' participation and general social trust? Is acceptance of inequality and policies of redistribution affected by inequality itself? What effects do political systems (coalitions/winner-takes-all) have? Finally, it focuses on costs and benefits of policies limiting income inequality and its efficiency for mitigating other inequalities (health, housing, education and opportunity), and addresses the question what contributions policy making itself may have made to the growth of inequalities.

Support and Activities

The project receives EU research support to the amount of Euro 2.7 million. The work will result in four main reports and a final report, some 70 discussion papers and 29 country reports. The start of the project is 1 February 2010 for a three-year period. Detailed information can be found on the website.

www.gini-research.org





GINI GROWING INEQUALITIES' IMPACTS

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