

## DETERMINANTS OF JOB QUALITY – EVIDENCE FOR EUROPEAN COUNTRY GROUPS\*

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Based on a micro-level approach and using data from the European Working Conditions Survey, covering 27 countries, we analyse the determinants of job quality. With cluster analysis applied to 11 dimensional indices, we form three homogeneous country groups and identify, by estimating twice-censored Tobit models, the main determinant factors affecting the individual level of job quality in each group. We verify the relevance of variables related to worker characteristics, firm characteristics, and the country in which the individual works. Among worker characteristics, education and employment status are the factors with the highest impact on job quality, while the economic sector is the most important firm characteristic. The results suggest the existence of important differences among groups regarding the magnitude of the impact of some factors. The highest dissimilarities are found between the group with better jobs (Nordic countries plus Belgium) and the group with lower quality jobs (Central and Eastern European countries plus Portugal and Greece). Variables related to age, education, dimension of the firm, and economic sector are those in which more heterogeneity is found among the groups.

**Keywords:** job quality, Europe, determinant factors, twice-censored Tobit model, cluster analysis

**JEL classification indices:** C51, J01, J21, J81, J88

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## 1. INTRODUCTION

Over the last decade, the concept of job quality has received considerable attention in the economic literature. Measuring the quality of jobs is a complex task that has been addressed through two approaches: macro-level (aggregate) and micro-level (individual) indicators.

To a great extent, the development of *aggregate* job quality indicators has been driven by the importance of this issue on the European agenda, with the Lisbon Strategy, and on the agenda of international organisations such as the ILO, with the debate on “decent work” (ILO 1999), and the OECD, with its emphasis on the need for employment policies for “more and better jobs” (OECD 2003). The definition of this group of indicators, which includes the Laeken indicators, is based on the choice of macroeconomic measures for the set of dimensions relevant for characterising job quality. These indicators allow comparisons across countries and provide important support for economic policies that seek, on the one hand, to ensure minimum standards of job quality and, on the other, to improve specific dimensions of job quality that show higher fragility.

The *micro-level* indicators are based on a concept of job quality that is more worker-related, being constructed from surveys focused on the characteristics of the job and on the quality of the match between worker and job. The importance of job quality at the policy level has also contributed to the development of this group of indicators. However, the proposals in this area also derive from other motivations, namely the intention to know how the various dimensions of job quality contribute to the overall evaluation that individuals make of their jobs, the factors affecting dimensional indices, and the impact of job quality on the mobility decisions of the workers.

Until now, the connection between these two approaches has remained very limited. Indeed, the exercise of conducting macro-level analysis based on micro indicators is scarce and the studies available are mainly descriptive (e.g., European Working Conditions Survey or EWCS for short) or have a restricted scope in terms of countries and dimensions included. However, the link between the two perspectives is important because it allows: (i) more complete international comparisons, based on a better understanding of the characteristics of jobs and the job-worker match, and (ii) an econometric analysis of the determinants of the overall level of job quality.

This study analyses the determinant factors of job quality in Europe. This could be achieved by considering the European area as a whole or by performing a country-level analysis. Both analyses have limitations. In the first case, we are not able to identify the heterogeneity of the countries, while the second approach would be difficult to implement due to the sample size available for each coun-

try. To overcome these limitations, we adopt a different approach by considering country groups. These groups are formed using cluster analysis based on the countries' profiles in terms of 11 job quality dimensions. We explore the determinants of job quality in each country group and develop a comparative analysis of the effects obtained by a group.

The paper is structured as follows. In the next section we provide an overview of the literature on job quality. Section 3 describes the process leading to the definition of country groups. Section 4 presents the model and the results, and some robustness checks are performed. The last section provides some final remarks.

## 2. BACKGROUND

### 2.1. Measurement of job quality

#### 2.1.1. Macro level indicators of job quality

The macro-level indicators developed to measure job quality can be divided into three groups: (i) systems of indicators, (ii) composite indicators, and (iii) "decent work" indicators.

*Systems of indicators.* The Lisbon Strategy, launched in March 2000, had a major role in emphasising the concept of job quality by establishing "the creation of more and better jobs" as a major objective of the European Union. The aim of promoting job quality prompted the need for indicators to monitor progress in this area. To this end, in 2001, the Laeken indicators were established. They address the multidimensional nature of this concept by considering that this is defined through 10 dimensions: (i) intrinsic quality, (ii) skills, lifelong learning, and career, (iii) gender equality, (iv) health and safety at work, (v) flexicurity and security, (vi) inclusion and access to the labour market, (vii) work organisation and work-life balance, (viii) social dialogue and workers' involvement, (ix) diversity and non-discrimination, and (x) overall economic performance and productivity. The job quality definition underlying the Laeken indicators is very broad, since it is not confined to the attributes of the job or to the job-worker match, also covering aspects of the labour market. Although including subjective dimensions of job quality, the Laeken indicators capture essentially objective dimensions.<sup>1</sup>

<sup>1</sup> The job quality dimensions can be divided into two groups: (i) objective dimensions, i.e., dimensions related to the characteristics of the job, and (ii) subjective dimensions, i.e., dimensions associated with the job-worker match.

Despite the merits of the Laeken indicators, they have been criticised on several points: (i) they do not have a theoretical basis, being driven by policy aims, (ii) these indicators do not take into account certain important dimensions (e.g., pay and intensity) and others are insufficiently covered (e.g., training), (iii) they include dimensions only indirectly related to job quality (dimensions 6 and 11), and (iv) job satisfaction is included in the list of indicators, but it can be considered a synthetic proxy for the overall quality of jobs (Green 2006; Davoine et al. 2008; Bustillo et al. 2009). To address some of this criticism, especially with regard to the first point, Davoine et al. (2008) propose a set of indicators to complement the Laeken indicators, which include measures related to wages and wage dispersion (mean wage in purchasing power parity and proportion of working poor), intensity (proportion of individuals working with tight deadlines and at very high speed), the cost and duration of training, and other working conditions such as physical risks, stress, and working hours.

In order to analyse the evolution of job quality since the mid-1990s in developed economies and to assess the causes of the observed changes, Green (2006) presents a framework that strongly influenced the literature on this subject. According to this proposal, the analysis of job quality should consider 6 objective and subjective dimensions: (i) skills, (ii) autonomy, (iii) intensity, (iv) health, (v) pay, and (vi) job satisfaction. This analysis is included among the macro-level approaches because of the empirical strategy adopted. Nevertheless, the underlying job quality definition is worker-focused. For this reason, Hartikainen et al. (2010), analysing the Finnish economy, have adopted this framework to develop a micro-level analysis of job quality.

*Composite indicators.* In a pioneering contribution, the Global Policy Network proposed the Good Jobs Index (Avirgan et al. 2005). This indicator considers (with equal weights) 5 dimensions (equal opportunity, salary, employment, social security, and the respect for labour rights). The aim of proposing an index that could be calculated for countries with different levels of development and the limited information available for least developed countries led to the exclusion of important dimensions of job quality.

Leschke et al. (2008) propose the European Job Quality Index with the aim of introducing an indicator of easy calculation for European countries. This index, which is more worker-focused than the Laeken Indicators, also considers equal weights and includes 6 dimensions: (i) wages, (ii) non-standard forms of employment, (iii) work–life balance and working time, (iv) working conditions and job security, (v) access to training and career development, and (vi) collective interest representation and participation. This proposal is criticised because it does not al-

low for a “detailed analysis of the distribution of job quality within each Member State” (Bustillo et al. 2009: 77).

*“Decent Work” indicators.* Many years ago, the ILO initiated a thorough debate on issues related to job quality by introducing the concept of “decent work”, described as “equal opportunities for both women and men to obtain decent and productive work in conditions of freedom, equity, security and human dignity” (ILO 1999: 3). Based on this definition, there were several proposals for measuring “decent work” (e.g., Ghai 2003). Despite the association between job quality and “decent work”, the concept of “decent work” is broader than the first. For this reason, it is a literature that, although related to the subject of this article, has a different focus and, therefore, is less central in our analysis.

### *2.1.2. Micro-level indicators of job quality*

The micro-level proposals can be divided into two groups: (i) the multidimensional indices and (ii) approaches that use job satisfaction as a proxy for overall job quality.

*Multidimensional indices.* Regarding the nature of the dimensions considered, we find three types of approaches: (a) measurement based only on objective dimensions, a strategy that is close to the literature on working conditions, (b) proposals in which the weight of the subjective dimensions is dominant, with a clear approximation to the literature on job satisfaction, and (c) proposals in which both objective and subjective dimensions are relevant.

In the first group, one important contribution is the “bad characteristics approach” (Kalleberg et al. 2000). According to this view, the quality of a job is related to the quality of some fundamental characteristics. Therefore, bad jobs are defined as those with four characteristics: (a) low pay, (b) no sick pay, (c) no pension scheme, and (d) no career ladder. Depending on the number of negative characteristics, an index of job badness is calculated. It is important to note, however, that this approach is based on a very limited set of dimensions, excluding some key objective dimensions (e.g., job security, autonomy, and intensity).

Using three waves of the EWCS, Amossé – Kalugina (2010) seek to analyse job quality in a dynamic perspective. The need to establish a platform for the joint analysis of the three waves of the survey reduced the countries and the dimensions considered. The authors construct a composite indicator of job quality, applying equal weights to five dimensions: (a) physical working conditions, (b) intensity, (c) autonomy, (d) health, and (e) learning. This indicator is based

on a very strict concept of job quality, strongly associated with the literature on working conditions.

Among the approaches in which the weight of the subjective dimensions is high, Brown et al. (2007) evaluate job quality in Britain by considering subjective measures for the following dimensions: job security, effort, stress, autonomy, climate of employment relations, satisfaction with pay, satisfaction with sense of achievement, and satisfaction with influence. Handel (2005) uses data from the General Social Survey to assess the perceived job quality, and considers how workers evaluate pay, security, career opportunities, autonomy, intrinsic rewards, stress, effort, intensity, and interpersonal relations.

Finally, regarding the approaches that consider both objective and subjective dimensions, we highlight the approach developed by the European Foundation for the Improvement of Living and Working Conditions (Eurofound), which materialises in EWCS. The EWCS is a specialised survey that has been conducted every five years since 1990/1991. This survey is the most complete source of information about job quality in Europe. Since the first time it was applied, the scope of the investigation has been extended to cover more countries and more job quality dimensions. The survey is based on a framework proposed by Eurofound (2002), which bases the definition of job quality on four dimensions: (a) career and employment security, (b) skills development, (c) reconciliation of working and non-working life, and (d) health and well-being.

*Job satisfaction as a synthetic indicator of job quality.* The use of job satisfaction as a proxy of job quality (Diaz-Serrano – Vieira 2005) is based on the assumption that when individuals assess the overall quality of their jobs, they take into consideration all aspects associated with the job and use a weighting system they consider adequate (Hammermesh 2001). This strategy allows, on the one hand, to overcome data limitations of existing surveys and, on the other hand, to account for the importance that each individual gives to the dimensions of the job. Naturally, since it is a synthetic measure, this approach does not reveal the quality of the various dimensions of each job, which represents one of its greatest limitations.

## 2.2. Empirical findings

Empirical studies on job quality have focused on technological progress, trade union density, institutions, and globalisation (Clark 2005; Green 2006; Brown et al. 2007). Motivated by the policy developments in Europe, Amossé – Kalugina (2010), with a micro-level approach, and Davoine (2006), using a macro-

level approach, seek evidence about the possible existence of a trade-off between quantity (more jobs) and quality (better jobs). The two studies draw almost opposite conclusions. While according to Amossé – Kalugina (2010: 18), “the jobs whose number is rising are characterised by high intensity, bad physical working conditions, higher perceived health and safety risks, and their overall quality is lower”, Davoine (2006) concludes that job quality in Europe presents an increasing pattern since 1995 and that, apparently, there is no trade-off between job quality and a dynamic labour market.

At a micro-level, some studies (partially inspired by earlier research about job satisfaction) explore the relevance of each dimension of job quality to the overall assessment that workers make of their jobs (Kalleberg – Vaisey 2005; Hartikainen et al. 2010) and the factors that influence dimensional indices (Smith et al. 2008; Hartikainen et al. 2010; Mühlau 2011). Let us now examine the conclusions of these studies in more detail.

Kalleberg – Vaisey (2005) conclude that there are several combinations of job characteristics that produce a “good” job. In particular, for workers to consider their jobs as high quality jobs, pay, autonomy, and intrinsic rewards were found to be especially important job facets. Focusing on Finland and comparing this country to other Nordic and European countries, Hartikainen et al. (2010) find that subjective perceptions are important to understand how workers evaluate their jobs. Job satisfaction is more strongly influenced by the worker’s assessment of intensity, autonomy, job content, fairness of pay, and job insecurity than by objective measures for the same dimensions. This research also finds that country effects have an important role in explaining job quality.

In a study with a strong policy motivation, and using data from the fourth EWCS, Smith et al. (2008) focus on three job quality dimensions (job content, autonomy, and working conditions), providing evidence for the influence of worker characteristics, job characteristics, and country effects on these dimensions. The probability of having jobs with good features is mainly explained by worked-related variables (sex and occupational status) and job-related variables (sector and working time). Contrary to the results of Hartikainen et al. (2010), the country effects are weaker than those produced by the other variables.

Focusing on how jobs held by men and women differ, not only in terms of overall quality but also in their dimensional characteristics, and how these differences change across European countries, Mühlau (2011) carries out a study with data from the European Social Survey. Despite the existence of country specificities, women have, on average, lower quality jobs than men. The only dimensions in which women rank better are work–life balance and safety.

Additionally, Clark (2001) uses the concept of job quality in order to contribute to the vast literature on labour mobility, concluding that these indicators are strong predictors of separations and quits.

### 3. COUNTRY GROUPS

Most studies seeking to analyse job quality in a comparative perspective are based on macro-level indicators of job quality. A less explored line of research, to which this study contributes, uses micro-level multidimensional indicators instead, which are usually applied with other research objectives in mind. However, this approach presents some important advantages since it allows us to identify, through an econometric model, the roles of worker-related, firm-related, and country-related characteristics in the explanation of the overall quality of jobs. In addition, it is possible to undertake a comparative analysis of the effects produced in the different countries, thereby exploring their similarity/dissimilarity.

In order to identify the dimensions to be included in this analysis, we proceed as follows. First, we survey the empirical literature to assess which dimensions are more frequently considered as important to characterise the quality of jobs. Second, we exclude job satisfaction and stress from this group. The reason for excluding job satisfaction is the one mentioned above in the discussion of the weaknesses of the Laeken indicators (see Section 2.1.1). Stress is excluded because it might be considered to be a consequence of other job quality dimensions (e.g., intensity or physical working conditions). As a result, eleven dimensions were considered ( $d = 1, 2, \dots, 11$ ). Third, we classify these dimensions into one of three categories: (i) core objective dimensions (i.e., objective dimensions almost always considered in micro-level indicators), (ii) complementary objective dimensions (i.e., objective dimensions frequently included in micro-level indicators), and (iii) subjective dimensions. In the first group, we consider five dimensions: pay, physical working conditions, intensity, autonomy, and job security. The complementary objective dimensions include health, promotions prospects, and learning. Finally, the bundle of subjective dimensions integrates work–life balance, interpersonal relations, and intrinsic rewards.

We use data from the fourth EWCS which covered 27 EU members, plus Croatia, Norway, Switzerland, and Turkey. *Table 1* identifies the questions used to evaluate each of these dimensions (which we designate as  $D_j^d$ , with  $j$  representing the worker) and their response scale. For some questions, it was necessary to invert the response scale in order to ensure that more favourable situations receive higher classifications.



*Table 1*  
Job quality dimensions

Dimensions	Questions from EWCS	Possible answers	D <sub>j</sub> <sup>d</sup>
Core objective dimensions			
Pay	EF5 Average net monthly income	Income classes	1–10
Physical working conditions	Q10 Are you exposed at work to ...? Q10A Vibrations from hand tools, machinery, etc. Q10B Noise Q10C High temperatures Q10D Low temperatures Q10E Breathing in smoke, fumes, powder, or dust Q10G Handling or being in skin contact with chemical products Q10I Tobacco smoke Q11 Does your main paid job involve ...? Q11A Tiring or painful positions Q11C Carrying or moving heavy loads Q11D Standing or walking Q11E Repetitive hand or arm movements	All of the time, Almost all of the time, Around $\frac{3}{4}$ of the time, Around $\frac{1}{2}$ of the time, Around $\frac{1}{4}$ of the time, Almost never, Never.	1 2 3 4 5 6 7
Intensity	Q20B Does your job involve ...? Q20BA Working at very high speed Q20BB Working to tight deadlines		
Autonomy	Q24 Are you able, or not, to choose or change ...? Q24A The order of tasks Q24B The methods of work Q24C The speed or rate of work	Yes, No.	1 0
Job security	Q37A I might lose my job in the next few months	Strongly agree, Agree, Neither agree/disagree, Disagree, Strongly disagree.	1 2 3 4 5
Complementary objective dimensions			
Health	Q33 Work affects health	Yes, No.	0 1
Promotion prospects	Q37C My job offers good prospects for career advancement	Strongly agree, Agree, Neither agree/disagree, Disagree, Strongly disagree.	5 4 3 2 1
Learning	Q37E At work, I have good opportunities to learn and grow		
Subjective dimensions			
Work–life balance	Q18 Working hours fit in with family/social commitments	Very well, Well, Not very well, Not at all well.	4 3 2 1
Interpersonal relations	Q37F I have very good friends at work	Strongly agree, Agree, Neither agree/disagree, Disagree, Strongly disagree.	5 4 3 2 1
Intrinsic rewards	Q25I Your job gives you the feeling of work well done Q25K You have the feeling of doing useful work	Almost always, Often, Sometimes, Rarely, Almost never.	5 4 3 2 1

Since the response scales of the questions included in some dimensions are different, we normalise them to the interval  $[0, 1]$ . The dimensional indices normalised through the max-min method are designated as  $\text{Dim}_j^d$ .

We excluded the countries with fewer than 500 observations (Luxembourg, Malta, Estonia, and Slovenia), leaving a sample of 27 countries. Since it is also necessary to exclude individuals who did not respond or did not know how to answer the questions regarding each dimension, our final sample includes 17,285 workers ( $j = 1, 2, \dots, 17,285$ ).

Our next step was to define homogeneous groups of European countries according to the degree of similarity they show with respect to the eleven dimensions of job quality considered. To do so, we started by calculating the dimensional indices for every individual in the sample and then determine the corresponding national averages. Next, we used cluster analysis.<sup>2</sup> This methodology is descriptive and non-inferential, and is therefore used primarily as an exploratory technique (Hair et al. 1998). Moreover, several methods can be used to decide which cases should be combined at each step. Thus, several exploratory cluster analyses were performed, applying three different frequently used approaches: Ward's method, complete linkage, and k-means clustering. In order to select one of these methodologies, discriminant analysis and statistical tests were performed. Discriminant analysis is a multivariate statistical technique used to distinguish between two or more pre-determined groups of objects. It is often used to evaluate the consistency of groups created by the cluster analysis. We selected the result provided by the Ward's method, comprising three clusters, because this solution revealed a perfect consonance between the predicted group membership resulting from discriminant and cluster analyses. In addition, the Mann–Whitney par test shows statistically significant differences among the three groups in at least one variable, as shown in *Table 2*.<sup>3</sup>

The cluster membership resulting from the selected methodology is the following: the first group (G1) includes all countries from Central and Eastern Europe (Bulgaria, Croatia, Cyprus, the Czech Republic, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Turkey) and two Southern European countries (Portugal and Greece); the second group (G2) includes countries from continental Europe (Austria, France, Germany, Netherlands, and Switzerland) plus Ireland and the United Kingdom and two Southern European countries (Italy and Spain);

<sup>2</sup> The formation of clusters from dimensional indicators was earlier carried out by Davoine et al. (2008). However, that study is based, as we mentioned above, on a very broad concept of job quality, and as a result, these country groups cannot be directly compared with the ones presented here.

<sup>3</sup> This non-parametric test was performed in order to prevent any possible violation of parametric tests assumptions.

*Table 2*  
Mann-Whitney Test (*p*-values)

Dimensions	Groups		
	G1–G2	G1–G3	G2–G3
Pay	0.045	0.085	0.505
Physical working conditions	0.008	0.020	0.947
Intensity	0.483	0.153	0.028
Autonomy	0.367	0.003	0.009
Job security	0.000	0.002	0.205
Health	0.000	0.300	0.014
Promotion prospects	0.013	0.023	1.000
Learning	0.007	0.001	0.006
Work–life balance	0.008	0.002	0.096
Interpersonal relations	0.688	0.020	0.039
Intrinsic rewards	0.423	0.167	0.350

and the third group (G3) comprises the Nordic countries (Denmark, Finland, Norway, and Sweden) and Belgium. *Table 3* presents some descriptive statistics concerning the average level of job quality and dimensional indices by country group.

*Table 3* clearly shows that group G3 has the highest average level of job quality, and the results are consistent with earlier-reported evidence that has emphasised the distinct nature of job quality in Nordic countries. According to Gallie (2003) and Hartikainen et al. (2010), higher quality of work tasks (the variety of work, learning opportunities, and autonomy on the job) is important in explaining the advantage of these countries. The good performance of the Nordic countries in these aspects largely derives, as mentioned by Gallie (2003), from the efforts of governments and social partners aiming to improve the quality of working life. On the other hand, group G1 – composed mainly of post-socialist Eastern countries, but also including the two poorest members of ex-EU15 – presents by far the lowest level of job quality. The intermediate position is occupied by the most developed continental countries. This group joins the countries that Mührlau (2011) designates as continental and liberal countries (this last group includes Ireland and United Kingdom).

A detailed analysis of the determinants of job quality at the micro-level will be concretised in Section 4. However, this preliminary evidence at the macro-level points to the importance of sectoral specialisation as an important explanation of job quality. Economic theories explaining the specialisation and trade patterns therefore provide useful insights to understand this evidence. These approaches emphasise, for instance, the role of factor endowments (including the qualifica-

*Table 3*  
Job quality and dimensional indices for country clusters

Group	Index	Average	Standard deviation	Minimum	Maximum	Max–Min
G1	Job quality index	0.612	0.032	0.556	0.653	0.096
	Dimensional indices					
	Pay	0.456	0.100	0.309	0.650	0.341
	Physical working conditions	0.727	0.042	0.639	0.779	0.140
	Intensity	0.590	0.109	0.439	0.741	0.302
	Autonomy	0.646	0.060	0.559	0.786	0.227
	Job security	0.664	0.055	0.546	0.756	0.210
	Health	0.501	0.104	0.304	0.668	0.364
	Promotion prospects	0.379	0.038	0.303	0.443	0.140
	Learning	0.516	0.069	0.376	0.611	0.235
	Work–life balance	0.644	0.053	0.544	0.721	0.177
	Interpersonal relations	0.715	0.047	0.734	0.880	0.146
	Intrinsic rewards	0.807	0.048	0.551	0.647	0.097
G2	Job quality index	0.674	0.022	0.640	0.703	0.063
	Dimensional indices					
	Pay	0.519	0.067	0.372	0.617	0.245
	Physical working conditions	0.782	0.036	0.721	0.825	0.104
	Intensity	0.561	0.052	0.483	0.632	0.149
	Autonomy	0.678	0.064	0.611	0.784	0.173
	Job security	0.777	0.041	0.697	0.833	0.136
	Health	0.699	0.055	0.598	0.769	0.171
	Promotion prospects	0.431	0.043	0.352	0.490	0.138
	Learning	0.601	0.047	0.531	0.685	0.154
	Work–life balance	0.715	0.053	0.605	0.783	0.178
	Interpersonal relations	0.711	0.060	0.778	0.887	0.109
	Intrinsic rewards	0.826	0.042	0.624	0.700	0.076
G3	Job quality index	0.697	0.025	0.668	0.725	0.058
	Dimensional indices					
	Pay	0.576	0.135	0.409	0.732	0.323
	Physical working conditions	0.779	0.032	0.724	0.802	0.078
	Intensity	0.496	0.046	0.465	0.577	0.112
	Autonomy	0.796	0.031	0.757	0.839	0.082
	Job security	0.815	0.050	0.755	0.867	0.112
	Health	0.557	0.091	0.451	0.699	0.248
	Promotion prospects	0.435	0.048	0.386	0.501	0.115
	Learning	0.707	0.044	0.632	0.744	0.112
	Work–life balance	0.762	0.038	0.718	0.819	0.101
	Interpersonal relations	0.783	0.042	0.785	0.889	0.104
	Intrinsic rewards	0.842	0.037	0.660	0.708	0.049

*Notes:* (1) The level of job quality for each worker is obtained as a weighted average of the dimensional indices with double weight to the dimensions of pay, job security, and intrinsic rewards (for more details, see Section 4). The values presented in this Table correspond to averages by country. (2) The minimum and maximum values are constructed using average levels of the indices (job quality and dimensional) by country. After having calculated these average levels, we report the index corresponding to the country with the lowest and highest level within each country group.

tion of the workforce), political, geographic, and demographic variables as well as technological dynamics as important determinants of sectoral specialisation in the several economies. According to the Eurostat, and taking all the countries considered in our analysis as a whole, the relative weights of agriculture, industry, and services in employment are 6.9%, 27.9%, and 65.2%, respectively. In turn, the members of group G1 show the highest share in agriculture (10.8%) and the lowest in services (58.1%), while the opposite occurs in group G3, with 3% of total employment in agriculture and 73.5% in services. Therefore, sectoral specialisation is probably strongly associated with the average level of job quality, helping to explain the differences documented in *Table 3*.

Despite the importance of this aspect, we should not neglect the relevance of many other factors such as the historical context, the role of institutions (namely the dominant economic system, the political orientation of the government, the role of social partners, collective bargaining structures, employment protection legislation, etc.),<sup>4</sup> and the development level of the country. Determining the exact contribution of each of these factors is not the goal of the present paper, but this is a very interesting topic for future research.

Let us now compare the country groups in terms of dimensional indices. Group G2 has the highest average values in two objective dimensions (physical working conditions and health). In the other dimensions, this group shows intermediate values, with the exception of interpersonal relations in which it ranks last. On the other hand, group G1 presents the lowest values in nine dimensions, but the best intensity index. Finally, group G3 achieves the highest average values in eight dimensions, including three core objective dimensions (pay, autonomy, and job security), two complementary objective (learning and promotion prospects), and all subjective dimensions.

It is also important to briefly analyse, through the last three columns of *Table 3*, the within group differences. Two main conclusions can be drawn: (i) group G1 is the one presenting the greatest heterogeneity not only concerning the overall job quality index, but also in terms of the dimensional indices, and (ii) the within group differences are similar in groups G2 and G3, although slightly lower in group G3.

<sup>4</sup> For a discussion on the role of institutional settings and employment regimes, see Eurofound (2007). For a survey on labour market institutions and their influence on employment outcomes, see Arpaia – Mourre (2012).

#### 4. DETERMINANTS OF JOB QUALITY BY EUROPEAN COUNTRY GROUPS

Based on the groups formed from the cluster analysis, we estimate an econometric model for each group in order to identify, at the worker level, the determinants of this phenomenon. To that end, we define a job quality index synthesising the 11 dimensions of job quality considered. In constructing the index, a key methodological option is the choice of the weights given to the several dimensions. There is evidence in the literature that some dimensions are more relevant than others when workers assess the quality of their jobs. Using data from surveys in which this issue was explicitly addressed, Rose (2003) and Clark (2005) found that pay, job security, and interesting job were the dimensions most frequently indicated as the most important. Following this evidence, we assign varying weights, giving more importance to pay ( $d = 1$ ), job security ( $d = 5$ ), and intrinsic rewards ( $d = 11$ ).

The job quality index for individual  $j$  ( $JQI_j$ ) can be obtained as:

$$JQI_j = \sum_{d=1}^{11} \alpha_d Dim_j^d, \quad (1)$$

with

$$\alpha_d = \begin{cases} \frac{1}{14} & \text{if } d = 2, 3, 4, 6, 7, 8, 9, 10 \\ \frac{2}{14} & \text{if } d = 1, 5, 11 \end{cases}.$$

This indicator ranges between 0 and 1, increasing with the level of job quality.

As potential determinants, we consider three groups of variables: (i) worker characteristics (nationality, sex, age, education, and employment status), (ii) firm characteristics (firm size, ownership sector, and economic sector), and (iii) the country in which the individual works. *Table 4* presents the definitions of the explanatory variables.

Our dependent variable is the job quality index for each worker ( $JQI_j$ ). When the dependent variable is bounded, the OLS method may result in biased and inconsistent parameter estimates. To overcome this problem, we use a twice-censored Tobit regression model. *Table 5* shows the results obtained for each country group.

Considering the impact of nationality on the quality of jobs, D'Amuri – Peri (2010) conclude that in Europe, immigrants tend to concentrate in low quality jobs and natives tend to specialise in jobs that involve more complex skills. These jobs are usually better in terms of pay, autonomy, and job security. This distribution of migrants across jobs can be explained by several factors, including

*Table 4*  
Definition of explanatory variables

Name	Description
<b>Worker characteristics</b>	
women	1 if the worker is a female
age15_24	1 if the worker is aged between 15 and 24
age25_39	1 if the worker is aged between 25 and 39
age40_54	1 if the worker is aged between 40 and 54
age55_64	1 if the worker is aged between 55 and 64
migrant	1 if the worker is a migrant
isced0	1 if the worker has pre-primary education
isced1	1 if the worker has primary education
isced2	1 if the worker has lower secondary education
isced3	1 if the worker has upper-secondary education
isced4	1 if the worker has post-secondary education
isced5	1 if the worker has tertiary education
senemploy- ees	1 if the individual is a self-employed with no employees
employer	1 if the individual is an employer
pcontract	1 if the individual is an employee with indefinite contract
ftcontract	1 if the individual is an employee with fixed-term contract
otcontracts	1 if the individual is an employee with other temporary contracts
<b>Firm characteristics</b>	
private	1 if the firm is integrated in the private sector
public	1 if the firm is integrated in the public sector
othersectors	1 if the firm is integrated in other sectors (joint private-public organisations; non-for-profit sector organisations; other)
micro	1 if the individual works in a firm with 1 to 9 employees
small	1 if the individual works in a firm with 10 to 49 employees
medium	1 if the individual works in a firm with 50 to 249 employees
large	1 if the individual works in a firm with more than 249 employees
nace1	1 if the firm operates in the Agriculture and Fishing sector
nace2	1 if the firm operates in the Manufacture and Mining sector
nace3	1 if the firm operates in the Electricity, Gas, and Water Supply sector
nace4	1 if the firm operates in the Construction sector
nace5	1 if the firm operates in the Wholesale and Retail Trade sector
nace6	1 if the firm operates in the Hotels and Restaurants sector
nace7	1 if the firm operates in the Transport and Communication sector
nace8	1 if the firm operates in the Financial Intermediation sector
nace9	1 if the firm operates in the Real Estate sector
nace10	1 if the firm operates in the Public Administration and Defense sector
nace11	1 if the firm operates in the Education and Health sector

*Table 4 cont.*

Name	Description
Country in which the individual works	
austria	1 if the individual works in Austria
belgium	1 if the individual works in Belgium
cyprus	1 if the individual works in Cyprus
czechrep	1 if the individual works in the Czech Republic
germany	1 if the individual works in Germany
denmark	1 if the individual works in Denmark
spain	1 if the individual works in Spain
finland	1 if the individual works in Finland
france	1 if the individual works in France
greece	1 if the individual works in Greece
hungary	1 if the individual works in Hungary
ireland	1 if the individual works in Ireland
italy	1 if the individual works in Italy
lithuania	1 if the individual works in Lithuania
latvia	1 if the individual works in Latvia
netherlands	1 if the individual works in the Netherlands
poland	1 if the individual works in Poland
portugal	1 if the individual works in Portugal
sweden	1 if the individual works in Sweden
slovakia	1 if the individual works in Slovakia
ukingdom	1 if the individual works in the United Kingdom
norway	1 if the individual works in Norway
switzerland	1 if the individual works in Switzerland
bulgaria	1 if the individual works in Bulgaria
croatia	1 if the individual works in Croatia
romania	1 if the individual works in Romania
turkey	1 if the individual works in Turkey

problems related to the international transferability of human capital, which influences the contours of the assimilation process (Chiswick 1978) and the existence of discrimination behaviours on the labour market (Altonji – Blank 1999). This theoretical prediction is confirmed by our results in groups G1 and G2 (with a greater differential in the second case), suggesting that in these groups, natives have better jobs than migrants. In group G3, the impact of nationality is not significant.

The evidence presented in *Table 5* also confirms the influence of sex, indicating the existence of a positive difference in the average level of job quality between men and women in line with the extensively studied predictions of the human capital theory and discrimination theory (for a survey, see Altonji – Blank 1999).



Table 5

## Determinants of job quality for country groups

Variables	Group G1		Group G2		Group G3		Hypothesis tests ( <i>p</i> -values)		
	Coef.	s.e.	Coef.	s.e.	Coef.	s.e.	G1– –G2	G2– –G3	G1– –G3
women	–0.022***	(0.003)	–0.028***	(0.004)	–0.030***	(0.004)	0.242	0.687	0.126
age15_24	–0.004	(0.006)	–0.022***	(0.006)	–0.035***	(0.008)	0.038	0.245	0.004
age25_39	–0.002	(0.003)	–0.005	(0.004)	–0.005	(0.004)	0.590	0.909	0.526
age55_64	0.011**	(0.005)	0.022***	(0.005)	0.012**	(0.005)	0.124	0.185	0.881
migrant	–0.027***	(0.009)	–0.034***	(0.008)	0.003	(0.013)	0.623	0.030	0.086
iscd0	–0.093***	(0.014)	–0.093***	(0.019)	–0.034	(0.040)	0.996	0.236	0.202
iscd1	–0.052***	(0.006)	–0.042***	(0.009)	–0.013	(0.014)	0.352	0.095	0.012
iscd2	–0.032***	(0.005)	–0.026***	(0.005)	–0.010	(0.007)	0.111	0.076	0.002
iscd4	0.038***	(0.005)	0.023***	(0.006)	0.016**	(0.007)	0.083	0.416	0.014
iscd5	0.100***	(0.004)	0.050***	(0.005)	0.052***	(0.005)	0.000	0.723	0.000
employer	0.026***	(0.006)	0.033***	(0.007)	0.012	(0.009)	0.394	0.065	0.208
senemployees	0.089***	(0.007)	0.075***	(0.008)	0.056***	(0.013)	0.176	0.154	0.012
ftcontract	–0.047***	(0.005)	–0.052***	(0.006)	–0.040***	(0.007)	0.547	0.238	0.454
otcontracts	–0.040***	(0.005)	–0.033***	(0.006)	–0.043***	(0.008)	0.382	0.356	0.791
public	0.027***	(0.005)	0.024***	(0.005)	0.004	(0.006)	0.637	0.013	0.003
othersectors	–0.002	(0.006)	–0.003	(0.007)	0.013	(0.009)	0.903	0.186	0.222
small	–0.002	(0.004)	0.005	(0.005)	0.016***	(0.005)	0.252	0.089	0.004
medium	–0.011**	(0.004)	0.003	(0.005)	0.021***	(0.006)	0.043	0.027	0.000
large	–0.009	(0.006)	0.005	(0.006)	0.031***	(0.007)	0.093	0.004	0.000
nace1	–0.022***	(0.006)	–0.021*	(0.012)	–0.031**	(0.014)	0.920	0.550	0.549
nace3	0.032***	(0.011)	0.073***	(0.014)	0.037**	(0.016)	0.014	0.077	0.789
nace4	0.007	(0.006)	–0.002	(0.008)	0.005	(0.010)	0.359	0.539	0.868
nace5	0.012**	(0.005)	–0.003	(0.006)	0.014*	(0.008)	0.089	0.115	0.815
nace6	0.004	(0.008)	–0.042***	(0.009)	–0.030**	(0.014)	0.000	0.501	0.045
nace7	0.012	(0.006)	–0.013	(0.008)	–0.012	(0.009)	0.022	0.970	0.034
nace8	0.073***	(0.010)	0.068***	(0.009)	0.055***	(0.011)	0.725	0.318	0.220
nace9	0.050***	(0.008)	0.022***	(0.007)	0.026***	(0.008)	0.011	0.722	0.033
nace10	0.038***	(0.007)	0.037***	(0.009)	0.034***	(0.009)	0.927	0.832	0.747
nace11	0.039***	(0.006)	0.025***	(0.007)	0.015**	(0.008)	0.127	0.368	0.019
cyprus	0.001	(0.008)							
czechrep	–0.060***	(0.008)							
greece	–0.047***	(0.007)							
hungary	–0.044***	(0.007)							
lithuania	–0.069***	(0.008)							
latvia	–0.060***	(0.007)							
poland	–0.067***	(0.007)							
portugal	0.043***	(0.008)							
slovakia	–0.020***	(0.007)							
croatia	–0.010	(0.007)							
romania	–0.031***	(0.007)							
turkey	–0.051***	(0.008)							
austria			0.034***	(0.008)					
germany			–0.006	(0.007)					

Table 5 cont.

Variables	Group G1		Group G2		Group G3		Hypothesis tests (p-values)		
	Coef.	s.e.	Coef.	s.e.	Coef.	s.e.	G1– –G2	G2– –G3	G1– –G3
spain			0.011	(0.007)					
france			0.023***	(0.008)					
ireland			0.045***	(0.007)					
italy			–0.012*	(0.008)					
ukingdom			0.012	(0.008)					
switzerland			0.022***	(0.007)					
belgium					0.062***	(0.006)			
denmark					0.060***	(0.006)			
finland					0.043***	(0.006)			
norway					0.029***	(0.006)			
Constant	0.675 ***	(0.013)	0.713***	(0.013)	0.658***	(0.017)			
No. observa- tions	8,015		5,454		3,816				
Log-likeli- hood	5,045.60		3,686.17		2,887.11				
Pseudo R2	–0.3134		–0.1921		–0.1376				

Notes: (1) The reference category is: male, between 40–54, non-migrant, uppersecondary education, employee with indefinite contract, working in Bulgaria (in the case of group G1)/Netherlands(G2)/Sweden(G3), with a job in a micro firm in the private sector operating in Manufacture and Mining. (2) The tests presented in the last three columns are Wald tests for the equality of the estimated coefficients between country groups. The null hypothesis is the equality of the coefficients. (3) \*, \*\*, \*\*\* significant at 10%, 5%, and 1%, respectively.

Also, the lower propensity of women for competitive environments (Niederle – Vesterlund 2007; Dohmen – Falk 2011), which limits their presence in top rank occupations, might help to explain this gap.

In all groups, job quality increases with age, this effect being stronger in groups G2 and G3. Learning in the labour market models and in the stepping stone models suggest a positive correlation between tenure and job quality and, in both cases, better matches last longer. Since there is a positive correlation between age and tenure (Mumford – Smith 2004), it is expected that older workers have better jobs.

Education is one of the most important determinants of job quality in the three country groups, especially in groups G1 and G2. More years of schooling are important in increasing access to better jobs. This effect is monotonous in both groups. Several studies carried out for developed countries conclude that education not only yields considerable monetary returns (Card 1999), but also brings non-pecuniary benefits such as environments with lower risks for health, work autonomy, and job security (Fabra – Camisón 2009). In contrast to the other groups, in G3 there is no significant difference in the levels of job quality for

individuals who have less than post-secondary education. Only above this level of schooling (*isced4*) do individuals have access to higher quality jobs.

Regarding the employment status, in all country groups (with the exception of G3, in which this is not verified for employers), being self-employed (*employer* and *senemployees*) is more favourable than working as an employee. This job quality differential is more pronounced in groups G1 and G2. This result is in line with recent research comparing self-employed individuals with wage earners, showing that the self-employed have higher levels of job satisfaction (Benz – Frey 2008a) due to a gain in terms of the work content and how the work is developed (namely because they are able to use their skills more intensively and enjoy greater autonomy). This evidence confirms the existence of a “procedural utility” as suggested by Benz – Frey (2008b), meaning that individuals derive utility from the process and not only from the outcomes.

Our results also suggest some differences among wage earners. In this group, those with more precarious contractual situations have, on average, poorer jobs. This penalisation of fixed-term and temporary workers has been recognised in partial analyses focusing on the impact of contractual arrangement on some dimensions of job quality such as wages, training, and career prospects (Brown – Sessions 2003).

Let us now consider the variables related to the firm. The research on the effects of the ownership sector has focused mostly on two job quality dimensions: wage and job security. In the literature, jobs in the public sector are found to be more stable and pay a wage premium (especially at the bottom of the wage distribution and for some specific groups of workers such as women), implying a higher level of job satisfaction with these dimensions in the public sector (Ghi-netti 2007). Gregory – Borland (1999) present a survey of the rationales for this premium, which include – among other factors – a differential in the objectives of these two sectors and the competition levels they face. Our evidence confirms the positive gap between public and private sectors in groups G1 and G2, while in group G3 there seems to be no difference between sectors.

The size of the firm has a statistically significant impact in groups G1 and G3, but the effect is different in these two cases. In group G1, only medium size firms offer lower quality jobs than average. On the other hand, a positive impact of firm size on the quality of jobs is found in group G3, which could be justified on several grounds. Differences in the quality of workforce, with larger firms hiring better workers, and the fact that unionisation rates are likely to increase with firm size, thereby affecting wages and other working conditions, are possible explanations for this pattern. On the other hand, in comparison to smaller scale firms, large enterprises have more developed internal labour markets and therefore are

more likely to offer better conditions in terms of pay, training, promotions, and future mobility perspectives.

The existence of permanent and considerable wage differentials between economic sectors is a well established fact (Gannon et al. 2007). The analysis of other working conditions has received much less attention. Our results confirm the existence of relevant and significant differences between sectors in terms of job quality. A first important conclusion is that jobs in the services sector are on average better than in agriculture and in industry. In all three country groups, Financial Intermediation (*nace8*) stands out as the sector in which the quality of jobs is higher. The sectors of Electricity, Gas, and Water Supply (*nace3*) and Public Administration and Defense (*nace10*) also show high levels of job quality. In contrast, the Agriculture and Fishing sector (*nace1*) in all country groups and the Hotels and Restaurants sector (*nace6*) in groups G2 and G3 are those with the lowest job quality.

Concerning the country dummies included in the model, we see some heterogeneity in all country groups. In fact, in each group, there are several countries with a level of job quality statistically different from that observed in the country of reference. The asymmetry between countries is greater in group G1.

In order to assess whether the estimated coefficients significantly vary among groups, we present tests to the hypothesis of the equality of these coefficients in the last three columns of *Table 5*. We perform this analysis by focusing on pairs of groups. Using a 95% confidence level, three main conclusions can be drawn: (i) the highest degree of dissimilarity is found when the group with better jobs is compared to the one with the lowest average level of job quality (G3 and G1, respectively), (ii) the highest similarity is found among groups G2 and G3, and (iii) age, education, firm size, and economic sector variables are those in which more heterogeneity is found among the groups regarding the determinant factors of job quality.

#### 4.1. Two robustness checks

##### 4.1.1. The influence of weights

As mentioned above, when we define the job quality index, a crucial issue is the choice of the weights attributed to each dimension. Using varying weights (as we did) is an option supported by earlier survey results. However, the use of equal weights is also very common in the literature.<sup>5</sup> Now, we test the robustness of the

<sup>5</sup> See Tangian (2005) for arguments supporting this option.

results to this option by re-estimating the models using as dependent variable an index in which the same weight is assigned to the eleven job quality dimensions (i.e.,  $\alpha_d = 1/_{11}$ ).

Comparing the results with the previous specification, we see that in overall terms the qualitative impacts are maintained. Nevertheless, there are some differences regarding the quantitative impact of some variables, namely concerning sex, age, employment status, firm size, economic sector, and country of work. The use of varying weights introduces more inequality between men and women, self-employed and employees, age groups, and countries within each group, while slightly reducing the gap between economic sectors. The effects in terms of firm size are mixed, varying with the country group considered. These changes occur because considering double weights for some dimensions introduces an additional penalisation for groups with the worst scores in those dimensions (e.g., women in the case of the dimension pay).<sup>6</sup>

#### 4.1.2. Ownership matters

The type of ownership of the firm is an important determinant of job quality, as discussed above and confirmed by our evidence. In the literature on job quality and job satisfaction, the research on this topic is scarce. Nevertheless, Demoussis – Giannakopoulos (2007) and Ghinetti (2007), among others, explore this topic. Using our framework of analysis, we now provide some insights into how worker variables, firm variables, and country of work affect the goodness of jobs in the two sectors. Due to data limitations, the analysis is carried out using the pooled sample of groups. Given the purpose of this investigation, the sample includes only workers in paid employment, working either in the public or in the private sector (13,786 workers). We then re-estimate the model for the *public* and *private* sample separately. The model shows a high degree of similarity concerning the qualitative and quantitative impact of most determinant factors. Nevertheless, some differences can be mentioned, namely at the quantitative level: (i) in the private sector, women and immigrants are more penalised (with this effect being stronger in the case of the sex variable) than in the public sector, (ii) the impact of less permanent contracts is more pronounced in the private sector, (iii) at the firm level, the most important differences between the private and public sectors are associated with variables related to the economic sector, and (iv) the gap between groups G1 and G3 is wider in the case of the private sector.<sup>7</sup>

<sup>6</sup> The results are available upon request.

<sup>7</sup> The results are available upon request.

## 4.2. Inter-group heterogeneity

In this paper we started out by calculating average job quality dimensional indices for 27 countries and three country groups were formed. A comparative study of the job quality determinants at group-level was then carried out. In this section we present a complementary analysis in order to provide some insights regarding the comparison between groups (inter-group heterogeneity). For this, our model was re-estimated for the pooled sample of groups. Instead of country dummies, we now considered dummies for the country groups.

The variables of most interest for the current analysis are the group dummies. The evidence is consistent with the descriptive analysis presented in *Table 3* at two main levels: (i) groups G3 and G2 offer better jobs than G1, and (ii) the distance between groups G3 and G2 is smaller than between any of these groups and group G1, reinforcing the notion that this group exhibits the lowest average level of job quality in the European context. Regarding the other explanatory variables, the results are qualitatively very similar to those shown in *Table 5*.

## 5. FINAL REMARKS

Based on an index that captures the main objective and subjective dimensions of job quality discussed in the literature, this study used data for 27 countries from the fourth EWCS to identify the determinants of job quality in Europe. We used cluster analysis considering 11 dimensions of job quality, forming three more homogenous groups of countries.

The first group (Bulgaria, Croatia, Cyprus, Czech Republic, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Turkey, Greece, and Portugal) presents the lowest average values in 9 of the 11 dimensions, but the highest intensity index. The second country group (Austria, France, Germany, Netherlands, Switzerland, Ireland, United Kingdom, Italy, and Spain) takes an intermediate position regarding almost all of the dimensions considered with three exceptions (the best situation in terms of physical working conditions and health, and the worst concerning interpersonal relations). The highest average level of job quality is found in the third group (Denmark, Finland, Norway, Sweden, and Belgium) with the highest scores in eight dimensional indices.

Regarding the determinants of job quality, three main conclusions should be highlighted: (i) the three sets of variables considered in the analysis – worker characteristics, firm characteristics, and the country in which the individual works – have an important role in explaining job quality, (ii) among worker characteristics, education and employment status are the two factors that have the highest

impact on the overall level of job quality, and (iii) the economic sector is the most important firm characteristic.

Additionally, it is important to note that despite the existence of common patterns in the influence of most determinants, there are differences between groups concerning the impact of some variables, especially regarding the characteristics of the firm, such as ownership sector and firm size.

The research conducted in this study allows us to conclude that there is a wide space for policy intervention seeking to improve the average quality of jobs. Effectively, in all three country groups, some critical determinant factors of job quality can be directly influenced by public policies, as, for instance, the previous experience in the Nordic countries suggests. Let us consider some of the most important potential actions. First, a decisive area of intervention concerns public policies aiming to increase the average educational level of the population and to improve the match between skills supply and demand. Second, it is important to reinforce the intervention against sex discrimination in the labour market, as emphasised since 1998 by the European Employment Strategy guidelines. Third, public policies (including an active policy of FDI attraction) that help to promote the structural transformation of the economy toward more modern and value-added sectors can also help to improve the average quality of the jobs. Fourth, another important contribution could be the promotion of entrepreneurship, not only by creating funding schemes to high-quality projects in key sectors, but also by developing various consultancy services (filling possible gaps in terms of critical skills), reducing bureaucracy (minimising the costs of starting and operating a business), and improving legislation.

In future research, based on national databases with more observations, it would be interesting to explore in more detail the heterogeneity of the different countries by estimating national models. As a complement to the analysis developed in this study, it would be interesting to analyse how worker variables, firm variables, and country variables affect each dimensional index in order to identify the effects produced on the overall level of job quality.

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