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THOMAS AMOSSÉ

thomas.amosse@cee-recherche.fr

Centre d'études de l'emploi, MSH Ange Guépin

EKATERINA KALUGINA

ekaterina.kalugina@cee-recherche.fr

Université d'Évry-Val d'Essonne, CEE and TEPP

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MORE AND BETTER JOBS IN EUROPE. REALLY?
**A MICRO-STATISTICAL ANALYSIS OF LINKS BETWEEN WORK QUALITY
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ABSTRACT

In this paper, we provide a micro-econometric analysis of the relationship between quality of work indicators and employment dynamics in ten European countries over the period 1995-2005. For this aim, we have matched two large scale data sources – the Labour Force Surveys and European Working Conditions Surveys – by country, year and socio-economic profile, which has been defined by combining gender, age, occupation and industry. Our results show that when reasoning on an unconditional level there is a positive relationship between quality of work and employment growth. However, after controlling for structural effects, jobs whose number is increasing are not necessarily of better quality than jobs whose number is declining. Agricultural, low skilled and young workers, individuals working in sectors related to infrastructures or education, health and public administration as well as living in Austria and Belgium are particularly concerned.

Keywords: Quality of work, working conditions, job dynamics, synergy, tension, cross-national comparison.

***Des emplois plus nombreux et meilleurs en Europe ?
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Résumé

Dans cette étude, nous présentons une analyse micro-économétrique de la relation entre la qualité du travail et la dynamique de l'emploi dans dix pays européens sur la période 1995-2005. Pour cela, nous apparions des données issues d'une part, des Enquêtes européennes sur les Conditions de Travail et d'autre part, de l'enquête Emploi à un niveau semi-agrégé, c'est-à-dire par année, pays et profil socio-économique, ce dernier défini par le sexe, l'âge, la catégorie d'emploi et le secteur. Nous montrons que « toutes choses inégales réunies », la relation entre la qualité du travail et la dynamique de l'emploi est positive. Pourtant, l'analyse « toutes choses égales par ailleurs » ne confirme pas ces résultats. À secteur d'activité et catégorie d'emploi donnés, les emplois dont le nombre augmente ne sont pas nécessairement de meilleure qualité que ceux dont le nombre diminue. Les habitants de l'Autriche et de la Belgique ainsi que les agriculteurs, les jeunes, les travailleurs peu qualifiés, les individus travaillant dans les secteurs des infrastructures et de l'éducation, de la santé et de l'administration publique sont particulièrement concernés.

Mots-clés : Qualité du travail, conditions de travail, dynamique de l'emploi, synergie, tension, comparaison internationale

INTRODUCTION¹

Since the mid-nineties and until the beginning of the crisis in 2008, European labour markets experienced a ‘golden decade’ compared to the high level of unemployment in the 1980s and its strong rise in the early 1990s: there was an increase in EU-15 employment of over 1% each year between 1997 and 2001; the unemployment rate fell from 10% in 1995 to less than 8% in 2001 and has since then remained stable (European Commission, 2006). Employment growth has been particularly intense in Ireland and Spain (more than 4% per year on average for 1995-2005) and there have been very substantial levels of job creation in sectors such as services and construction.

However, some concerns have been raised that this employment growth has been accompanied by the development of low-quality jobs (OECD, 2006)². In a more critical view, Salais (2009: 218-219) has underlined that ‘the overall growth of the employment rate (a pivotal indicator of the EES [European Employment Strategy]) has been mostly achieved since 1997 by an increase in the number of “poor jobs”’. The expression refers to low wage and short (or part-) time jobs, with contracts that offer little protection and have high work intensity. Olsen *et al.* (2010) note that greater pressure and insecurity perceived by employees in Europe may be due to changes in labour market and work organisation. Indeed, new types of contracts, organisational practices including changes in working hours and wage moderation, have been observed in many European labour markets during the period between 1995 and 2005 (Eyraud and Vaughan-Whitehead, 2007).

Considering the situation in the United States, Osterman and Shulman (2011) claim that improving education and encouraging innovation in the so-called ‘knowledge economy’ is not enough to improve work for everyone, especially when labour market institutions have been weakened. These two authors plead for public policy to counter such inequalities. Their view is not far from Kalleberg’s (2009), who describes the United States employment system as increasingly polarised between good and bad jobs, thus echoing ‘low- and high-road capitalism’ (Osterman, 2000) and the much earlier segmentation theory (see Piore and Doeringer, 1971, for instance).

In the European academic sphere as in the political arena, such debates have also existed for over a decade. Synergy between job quality and employment growth has even been advanced in the EU policy agenda in the Lisbon Strategy (see Goetschy, 2007, for a presentation). Launched in 1997 and formally adopted in 2000, this strategy (also called the European Employment Strategy, hereafter EES) presented socially sustainable economic growth as an objective, focusing not only on job creation but also on job quality. ‘More and better jobs’ was presented as the main objective for Europe³. More than ten years after its adoption, has this slogan been realized?

¹ The research upon which this article is based has been undertaken in the Network of Excellence of the European Union RecWoWe (Reconciling Work and Welfare in the European Union; 2007–2011; www.recwowe.eu). It thus benefited from opportunities for preliminary presentation and scientific exchange.

² The *Employment Outlook* issue for 2006 presents a reassessment of the OECD jobs strategy with more attention paid to job quality.

³ The organisation of an international conference in 2005 entitled ‘Help Wanted: More and Better Jobs in a Globalised Economy’ with the participation of the World Bank’s senior vice-president and the ILO’s Director General shows the success of the slogan and the hope, prior to the crisis, of having it enter the global policy agenda with force.

This article sheds new light on this question. We first present an overview of job quality debates in Europe over the last two decades and provide some elements of theoretical discussion and data-based evidence concerning links between job quality and employment growth. This review of the literature shows that these links are globally positive. But some hypotheses require further empirical examination: does this positive relationship still stand after taking into account the nature of work (type of contract, supervision position, ICT use) or type of job (occupation, industry) and category of the workforce (gender, age)? Does the average link hide a process of polarisation for all or for only some work quality aspects, as well as for countries, types of jobs and workforce categories?

We then present our empirical strategy. First, we focus on particular aspects of job quality which are known to have consequences on health or career perspectives (physical working conditions, job stress or learning opportunities). Second, we link individual work quality perception to job dynamics' indicators by matching at a *meso* level⁴ two EU micro-statistical large scale datasets – the European Working Condition Surveys (EWCS) and the Labour Force Surveys (LFS) – for ten European countries and three different years (1995/6, 2000 and 2005). Third, we use a heteroscedastic estimator to take into account the particular design of the resulting dataset in order to check for composition effects in explaining individual work quality perceptions by job dynamics.

Using descriptive statistics and multivariate analysis, we compare quality of work indicators declared by employees when the number of jobs increases or decreases in a given year in their country and socio-economic profile (occupation, industry, age and gender). The polarisation hypothesis is then examined with analyses where 'good' or 'bad' work quality jobs are compared to 'median' quality jobs in terms of employment creation and then with separated analyses by occupation, industry, gender, age, country and year. Further discussion tends towards qualifying the 'more and better' conclusion. While the work quality aspects studied here are supposed to be less directly linked to labour market changes as compared to contracts, hours or wages, negative consequences of such changes exist, as we shall see, and they particularly affect some categories of the labour force such as young or low-skilled workers.

1. JOB QUALITY AND JOB QUANTITY: A BRIEF REVIEW OF THE LITERATURE

Over the last ten years, discussion of job quality has undergone a considerable development in Europe, both in the political and academic fields (Davoine *et al.*, 2008). In the political debate, the concept of job or employment quality officially emerged in the conclusions of the European Council in the early 2000s. Quality was even then described as being at the heart of the European social model, underlying the EES which links the dual goals of competitiveness and cohesion (Peña-Casas, 2009, for a brief history).

⁴ We define a category (called socio-economic job profile) by crossing four of the main characteristics of both the supply and demand sides of labour (gender, age, occupation, industry), which also count among major explanation factors of observed differences in work quality perceptions (see below for more discussion on this key variable).

1.1. Job quality: uncertain political aim, multidimensional notion

The advancement of job quality has been uneven over time and is dependent on the economic situation and political context. Sustained economic and employment growth combined with the political context of a left wing and social-democratic majority favoured the debates on job quality in the early years of the millennium. However, since 2003, because of the disappointing evaluation of the EES and the new increase in unemployment, interest for this notion seems to have declined in the EU policy agenda. Job quality remained one of the pillars of the 2003 revised EES but its interpretation had changed substantially. Indeed, this 'new EES' advanced 'quality and productivity at work' as its second main objective⁵. Since then, the notion in the European political arena has been more oriented towards greater productivity and financial attractiveness for job creation, with less attention given to the employee's opinion. The Kok report (2003), entitled *Jobs, Jobs, Jobs: Creating More Employment in Europe*, illustrates an obsession about job quantity which leaves quality in the shadows. And, as noted by Barbier and Samba-Sylla (2004), other themes like flexicurity indirectly weakened the importance given to the notion. 'Europe 2020', the EU strategy adopted in 2010, follows the same orientation. Job quality is now clearly a notion of second rank, far behind the global strategy of 'smart, green and inclusive growth', where the only employment target is the increase in employment rates⁶.

The monitoring of progress in job quality on the European level has been based on Laeken indicators adopted in 2001, which are composed of ten different dimensions: intrinsic job quality; skills, lifelong learning and career development; gender equality; health and safety at work; flexibility and security; inclusion and access to the labour market; work organisation and work-life balance; social dialogue and worker involvement; diversity and non-discrimination; and overall economic performance and productivity. Other international organisations and official agencies also have their own job quality definitions. The European Foundation for the Improvement of Living and Working Conditions (Eurofound) distinguishes four dimensions: career and employment security; skills development; health and well-being; reconciliation of working and non-working life (Parent-Thirion *et al.*, 2007). The International Labour Office has introduced a concept of 'decent work' (ILO, 2001)⁷.

Apart from but occasionally related to these official definitions, academic authors and other institutional publications (Dahl *et al.*, 2009, for a recent review) take different job quality dimensions into account: earnings, job security (measured, for example, by temporary and involuntary part-time work), working conditions (in a broad interpretation including physical working conditions, job effort, job content, etc.) and job satisfaction. All these dimensions have been used for mapping and drawing job quality evolution across the EU.

⁵ The other principal objectives were, first, full employment followed by cohesion and social inclusion in third place (Council Decision of 22 July 2003 on guidelines for the employment policies of the Member States).

⁶ A detailed presentation of the strategy can be found at: http://ec.europa.eu/europe2020/index_en.htm.

⁷ 'The goal of decent work is best expressed through the eyes of people. It is about your job and future prospects; about your working conditions; about balancing work and family life, putting your kids through school or getting them out of child labour. It is about gender equality, equal recognition, and enabling women to make choices and take control of their lives. It is about personal abilities to compete in the marketplace, keep up with new technological skills and remain healthy. It is about developing your entrepreneurial skills, about receiving a fair share of the wealth that you have helped to create and not being discriminated against...' (ILO, 2001, cited from Green, 2006: pp. 19-20).

1.2. What about job quality trends in Europe since the mid-nineties?

Is there evidence that there were improvements in job quality during the 1995-2005 decade of relatively high employment growth? Existing literature suggests an uncertain answer, with underlying variations between the different countries and quality aspects examined.

Applying Laeken indicators from the LFS, Davoine and Erhel (2007) show a slight upward trend of job quality in twelve European countries since 1994. However, this European concept of job quality is broad and tends towards the measurement of quality of labour markets rather than towards work quality (Peña-Casas, 2009). Moreover, it does not take into account such important aspects of work as work intensity, learning opportunities and health and safety at work. As noted by Peña-Casas and Pochet (2009: 50): “*concerning job quality as a whole, the picture is blurred and the evolution mitigated in an examination of the countries. No clear-cut vision emerges, as for each country the situation is better for certain job quality patterns than for others. Furthermore, the positive or negative developments do not necessarily affect the same job quality patterns according to the groups of countries, and their significance is heavily dependent on the initial level of job quality*”.

Focusing on different dimensions of perceived quality of work (using the EWCS), Peña-Casas and Pochet (2009) also show that some negative aspects seem to have largely declined in industrial activities throughout Europe, as for instance exposure to health risks or night work. Worker rights have improved in almost every country. But at the same time, jobs with poor learning opportunities and poor access to training, shift work or non-fixed working schedules, greater work intensity and health-related absenteeism are on the increase in almost all countries of the EU-15. Greenan *et al.* (2012) even show that the degree of work complexity has fallen between 1995 and 2005. These last findings largely confirm some previous studies on job quality trends, which showed a rather disappointing picture in advanced countries. With a wide set of national and international data, Green (2006) shows a decline in the overall level of job satisfaction and more intense work effort in Britain and modern industrialised economies in the last decades of the millennium. He also highlights a significant decline in employees’ sense of job security and work discretion. Similar conclusions have been drawn in many countries with national large scale statistical data, for instance in France by Bué *et al.* (2004) or Coutrot *et al.* (2007).

These results suggest that job quality perceived by workers did not improved globally in Europe during the 1995-2005 ‘golden decade’ of employment growth. This is notably the case for job quality aspects which are close to work content (called hereafter ‘work quality’): work effort has been intensified, worker’s influence over the job and learning opportunities have been diminished and there is no evidence of extended and durable improvement in working conditions. Divergent trends of quantitative performance of labour markets in Europe on the one hand and work quality on the other lead towards an in depth analysis of existing links between the qualitative and quantitative evolution of work and employment. This is precisely the aim we follow in our article, first providing theoretical and empirical insights as preliminary elements of discussion.

1.3. What is known about links between job quality and job quantity

Hypothetical links between quantity of employment and job quality are unclear in literature. As far as we know, no systematic examination of the question from a theoretical point of view has

been carried out yet. But possible economic mechanisms have been stressed (Davoine, 2006: 7-10, for a first review), notably in the EU discourse where mainly positive effects are expected (Peña-Casas, 2009).

First, improving quality of work and employment can make jobs more attractive and stimulate labour supply. Good quality jobs may encourage those who are labour market 'outsiders' to (re)enter employment and to limit early withdrawals. It may thus sustain employment. Second, quality of jobs may increase workers' productivity (through an increase in human capital or motivation effects, for example). It also limits hidden costs of 'bad jobs' (absenteeism and repeated hiring due to work accidents or demotivation). It may therefore foster economic growth and job creation. So, improving quality can positively affect both labour supply and demand and lead to employment growth⁸.

However, a negative relationship is also possible. In a Keynesian perspective, making work more attractive does not have an impact on employment creation, which is mainly driven by labour demand. And with the strong negotiation power due to a high level of unemployment, firms may be able to increase productivity by increasing demands on workers, thus encouraging resignations and/or a delay in recruitment. For neo-classic economists, improving quality has a cost – directly through wage increases or working hour limitations for instance; or indirectly through health and safety equipment, training sessions, etc. – which may moderate employment creation, or accelerate employment destruction, if the cost/benefit balance is not in favour of quality.

The sign of the relation between job dynamics and work quality is thus unclear. This may even be the case within an industry or a firm. According to labour market segmentation theories, both 'good' and 'bad' jobs may be created in the same place and at the same time: for Barbier and Samba-Sylla (2004, p. 75) 'quality is about protecting insiders' at least for some members of the European Employment Committee. Analysing structural trends and the economic strategy of European countries during recent decades, Emmenegger *et al.* (2011) describe a certain polarisation process, called dualization, for some countries like France or Germany. And although polarisation is not yet documented for all countries in the EU, Goos *et al.* (2010) suggest that it concerns almost all of them.

In contrast to this uncertainty, existing empirical literature provides a rather more unambiguous picture, suggesting quite clear synergies between job quality and employment quantity. The question has mainly been analysed in three different ways, all of them relying on statistical data but examining them at different levels (country, industry), with different definitions of job quality and employment quantity and through different models of their links.

Using the Labour Force Surveys (LFS) and the European Community Household Panel (ECHP) to calculate indicators at the national level, Davoine (2006) shows a positive correlation between job quality measured by Laeken indicators and employment rate⁹ in Europe: the same countries seem to have the best performance in terms of employment quality and employment quantity (Nordic and Liberal countries *versus* Continental and Southern

⁸ For example, the 2002 *Employment in Europe* report focuses on synergies between quantity and quality of jobs and highlights five positive effects of high job quality: 1. higher employment persistence and job creation and lower risk of job loss, unemployment or social exclusion; 2. Improvements in work relationships which are likely to contribute positively to productivity; 3. Improved adaptability and employability through human capital investments and training; 4. increased labour supply through increases in the attractiveness of jobs; 5. increased incentives for labour market participation through a better work-family balance (European Commission, 2002).

⁹ This indicator, whose increase has been set as the main quantitative target of the EES, is defined as the share of employed individuals for a given population (for instance for the 20-64 aged people).

countries). A chapter of the 2008 *Employment in Europe* report, based on the work done by Davoine *et al.* (2008), provides coherent and more detailed results: also measured at a national level, good working conditions and high socio-economic positions are positively correlated to better labour market outcomes (higher employment rates, lower youth unemployment, etc.). Conclusions drawn are directly in line with the policy orientation of the European Union, suggesting that promoting job quality would be favourable to labour market performance. Yet these empirical analyses only consider national and static outcomes of labour markets, both quantitative and qualitative. Consistent with this frame, better quality and better performances in a country might be both explained by structural patterns of the labour market and thus not really influence each other.

Other analyses, based on the longitudinal data of the European Community Household Panel (ECHP), focused on transitions in the labour market in order to map evolutions of job quality from one year to another. They took place as specific chapters of the *Employment in Europe* reports that the European Commission published in the early years of the millennium (2001, 2002, 2003 and 2004). As noted by Peña-Casas who provides a review of these reports (2009: 59–64), they lead to the principal conclusion that transition matrixes are asymmetric which implies (following a simulation model presented in the 2002 issue) an attraction effect of good quality jobs and finally a parallel upward trend for job quality and employment rates. The 2003 issue leads, certainly, to more balanced results: in countries like Spain, and to a lesser extent in France and Greece, transition rates out of low quality jobs are higher into unemployment than into high quality jobs; and there is evidence that there is globally in Europe a negative relationship between flexibility of labour markets, which have sustained strong job growth in the late 1990's, and high job quality. But the conclusion is not that quality and quantity of work and employment are contradictory. The report highlights that one needs to compensate higher flexibility by improving other aspects of job quality. These analyses of possible trade-offs between quality and quantity take directly into account job dynamic features of labour markets but remain at a national level and suffer from difficulties in summarising job quality.

More recent studies compare levels of employment growth to the quality of corresponding jobs. A report entitled *More and better Jobs* (Eurofound, 2008) describes employment growth in each country, breaking up jobs into five 'quality quintiles' (corresponding to five equal-sized groups of jobs, ranked from lowest to highest median hourly wages¹⁰) helping identify the kinds of jobs which have grown to a greater or lesser degree. Patterns of employment growth by wage levels are further differentiated according to economic sectors, employment status, gender and nationality, in order to advance some possible explanatory hypotheses and to identify specific patterns for subgroups of the population. The main conclusion is that most EU-15 countries have generated more and better (paid) jobs in the decade after 1995. There has been a clear upgrading trend for all countries (and especially for Ireland, Denmark, Finland or Sweden). France and the Netherlands can be seen as exceptions because of the polarisation they experienced, with high levels of employment growth both in low- and high-wage jobs. A more recent report (Holman and McClelland, 2012), which is part of the broader European Project WALQING (for 'Work and Life Quality in New and

¹⁰ Employment data was taken from the European Labour Force Survey. The ranking of the jobs in each country was done using the European Structure of Earnings Survey (ESES) and the European Survey of Income and Living Conditions (EU-SILC). The consolidated data base is termed the European Jobs Project Database.

Growing Jobs')¹¹, follows a similar schema of analysis, not only for wages (a large spectrum of job quality aspects are examined) and not between countries (differences are mapped between economic sectors). Sectors are divided into four groups according to the decline / growth of jobs and the level of quality of jobs (higher / lower than average). Results suggest that only for some economic sectors do job quality and employment growth go hand in hand¹².

Literature thus provides a growing amount of empirical evidence suggesting synergies between job quality and employment growth. But as we have seen, this conclusion encounters some counterexamples: synergies are far less obvious when considering job quality aspects such as job security or work intensity or when examining countries like Spain, Greece, France or the Netherlands. Results vary considerably across economic sectors, and this might probably be the case across occupational groups as well. These limitations to the 'more and better jobs' conclusion encourage the development of new empirical evidence where structural factors of both job quality and employment growth would be taken into account, which is precisely the aim of our investigation. Two main hypotheses will therefore be considered: first, is the positive correlation stated at national levels between quality and quantity spurious, because of composition effects due to the nature of work (type of contract, supervision position, ICT use), the type of the job (occupation, industry) or the category of the workforce (gender, age)? Second, besides the mean effect, are there some indications of a polarisation process (on the whole or between countries, industries, occupations, age groups, etc.)?

2. DATA AND METHODS

Our aim being to investigate structural patterns of work quality and job dynamics, notably going over national idiosyncrasies and conjuncture, we are faced with three methodological challenges. The first is relative to the definition of quality, the second to the linkage of quality and quantity, and the third to the models and estimation procedures.

2.1. Work quality: a micro-statistical measurement

We focus on intrinsic quality of work, *i.e.* job quality aspects which have received less attention than wages, type of contracts (temporary or limited *versus* unlimited) or working hour arrangements (notably part-time *versus* full-time jobs). Five dimensions have been considered: *physical working conditions*, *work intensity*, *autonomy*, *perceived health hazards due to work and learning work*. Although grounded on perceptions (see Gollac, 1997 for a discussion of the 'subjective' nature of working conditions measured through workers surveys), this work quality notion is documented to influence workers' health or career development (Karasek and Theorell, 1990; Freeman and Kleiner, 2000; Winter and Zollo,

¹¹ This project is funded in the 7th Framework Program and goes from December 2009 to December 2012. It has produced other reports, some of them relying on sector case studies carried out in different countries. They allow documenting not only the new 'better' jobs but also the new 'worse' ones. For more information see www.walqing.eu

¹² Levels of job quality and employment growths are 'high' / 'positive' for Financial intermediation, Business, Public administration, Education, Health and Social work and they are 'low' / 'negative' for Manufacturing, Agriculture, Transport. For the other economic sectors, jobs are growing but quality is lower than average (Retail, Construction, Hotels and Restaurants, Other Services, private Households) or jobs are declining but quality is higher than average (Energy).

2002; Daubas-Letourneux and Thébaud-Mony, 2003)¹³. As we will see, for each of these dimensions, the evolution of items or indicators has shown no improvement in Europe during the 1995-2005 decade.

Our quality of work indicators are derived at the individual level from the European Working Conditions Surveys (EWCS). These surveys aim to provide an overview of the state of working conditions as perceived by workers in the European Union, as well as to indicate the nature and content of changes affecting the workforce and the quality of work (Parent-Thirion *et al.*, 2007). The survey methodology is based on a multistage random sampling method ('random walk') involving face-to-face interviews undertaken at the respondent's principal residence. Data covers a representative sample of the total population in employment, *i.e.* persons who at the time of interview were either employees or self-employed workers¹⁴. Approximately 1,500 active persons in each country¹⁵ were interviewed, among which we selected the employees between 20 and 59 years old in ten European countries¹⁶: Austria, Belgium, Denmark, Spain, France, Greece, Ireland, Italy, Netherlands and Portugal. The survey was carried out four times in 1990/1, 1995/6, 2000 and 2005 by the European Foundation for the Improvement of Living and Working Conditions (Eurofound). As the survey of 1990/1 contains fewer questions than the following ones, only data of 1995/6, 2000 and 2005 are used for our analysis. Having three different years makes it possible to investigate trends in both conjuncture and work quality. Besides work quality, the EWCS datasets contain information about job (industry, occupation) and individual (gender, age) characteristics.

The five dimensions we retained are presented in Table 1 below: *physical working conditions* correspond to painful or tiring positions, noisy atmosphere, high or low temperatures, etc.; *work intensity* to working at a very high speed and to tight deadlines; *autonomy* to the possibility of choosing or changing the order of tasks, and the method or speed of work; *healthy work* to the perception that health or safety is at risk because of work; and *learning work* to non-monotonous tasks and the possibility of learning new things. To facilitate the results' presentation, work quality items have all been normalised between 0 and 1, with higher values indicating a better quality and lower values a worse one.

Each item of the survey contributes to the measurement of quality of work but none of them is sufficient to define it on their own. They are related to each other¹⁷. Workers situations most often cumulate several of them for each quality of work dimension. We thus sum up initial items for each quality of work dimension (with the exception of health risks¹⁸) by calculating indicators as arithmetic scores¹⁹.

¹³ This is not the case for all of the Laeken indicators for instance, since some have been defined as part of job quality for political, moral or social reasons (as for instance gender equality, social dialogue and worker involvement, diversity and non-discrimination).

¹⁴ The target group is composed of 'persons in employment' as defined by the LFS (Eurostat): 'persons in employment refers to those who did any work for pay or profit during the reference week (the reference week varied from country to country) or those who were temporarily absent from their jobs'.

¹⁵ Samples were smaller in countries like Luxembourg (500) or Denmark (1,000).

¹⁶ For practical reasons since for some countries one did not have the corresponding LFS (see later).

¹⁷ Correlations between items are all positive and mostly significant. Results are available upon request.

¹⁸ For this dimension, the EWCS only comprises one question.

¹⁹ We have also used Multiple Correspondence Analysis (Greenacre, 1984) to define synthetic indicators. Conclusions being similar with such indicators, we have chosen to use arithmetic scores whose construction is more simple to understand and more easily replicable.

Table 1. Work quality indicators

Questions asked in the European Working Conditions Surveys in 1995/6, 2000 and 2005	Name of items	Work quality dimensions	Possible answers, numeric codes
<p>1995–1996: <i>When at work, are you exposed to...?</i></p> <p>2000–2001 and 2005: <i>Please tell me, using the following scale, are you exposed at work to...?</i></p> <p>Noise so loud that you would have to raise your voice to talk to people?</p> <p>High temperature which makes you transpire even when not working?</p> <p>Low temperatures whether indoors or outdoors</p> <p>1995–1996 and 2000–2001: Breathing in vapours, fumes, dust or dangerous substances such as chemicals, infectious materials etc.</p> <p>2005: Breathing in smoke, fumes (such as welding or exhaust fumes), powder or dust (such as wood dust or mineral dust) etc.</p> <p>1995–1996 and 2000–2001: Handling or touching dangerous products or substances</p> <p>2005: Handling or being in skin contact with chemical products or substances</p>	<p>Noise</p> <p>Heat</p> <p>Cold</p> <p>Smoke</p> <p>Toxic</p>	Physical working conditions	<p>All of the time (0)</p> <p>Almost all of the time (0.17)</p> <p>Around ¾ of the time (0.33)</p> <p>Around half of the time (0.5)</p> <p>Around ¼ of the time (0.67)</p>
<p>1995–1996: <i>How often does your main job involve each of the following...?</i></p> <p>2000–2001 and 2005: <i>Please tell me, using the same scale, does your main paid job involve...?</i></p> <p>Painful or tiring positions</p> <p>Carrying or moving heavy loads</p>	<p>Pain</p> <p>Heavy</p>		<p>Almost never (0.83)</p> <p>Never (1)</p>
<p>Working at a very high speed?</p> <p>Working to tight deadlines?</p>	<p>Speed</p> <p>Deadlines</p>	Work intensity	
<p><i>Are you able, or not, to choose or change:</i></p> <p>Your order of tasks</p> <p>Your methods of work</p> <p>Your speed or rate of work</p>	<p>Order</p> <p>Method</p> <p>Rate</p>	Autonomy	<p>Yes (1)</p> <p>No (0)</p>
<p><i>Do you think your health or safety is at risk because of your work?</i></p>	<p>Health</p>	Healthy Work	<p>Yes (0)</p> <p>No (1)</p>
<p><i>Does your main paid job involve:</i></p> <p>Monotonous tasks?</p> <p>Learning new things</p>	<p>Monotone</p> <p>Learn</p>	Learning Work	<p>Yes (0), No (1)</p> <p>Yes (1), No (0)</p>

Reading: Codes are chosen so that higher values always indicate a better work quality.

Source: EWCS, 1995–1996, 2000–2001 and 2005.

The ‘*physical working conditions*’ indicator is derived from the sum of seven ordinal variables (being exposed to noise, high temperature, low temperature, breathing in vapours, handling chemical products, work involving painful positions, and finally carrying heavy loads) divided by 7; the ‘*work intensity*’ indicator is the sum of two ordinal variables (working at a very high speed and working to tight deadlines) divided by 2; the ‘*autonomy*’ index is derived from the sum of three binary variables (not having the possibility to choose or change order of tasks, methods of work, speed or rate of work) divided by 3; the ‘*learning work*’ indicator is the sum of two binary variables (work involves monotonous tasks, one cannot learn new things at work) divided by 2. Finally, the *total work quality* indicator is derived from the sum of the binary item relative to health and safety at work and the four previous indicators of the different quality of work dimensions, divided by 5.

2.2. How to link quality of work indicators and job dynamics. Matching two large scale European datasets

The objective of the article is to disentangle the effects on work quality of the structural evolution of the labour supply and demand on the one hand and the effects of firm trade-offs, possibly favoured by public policies, between quantitative and qualitative sides of employment on the other. Analyses are therefore based on the construction of socio-economic categories or profiles, defined by crossing economic variables related to labour demand (industry, occupation) and demographic variables related to labour supply (age, gender). These profiles are central in our empirical strategy because they can link quality and quantity of employment: with year and country, they are used at a *meso* level as key variables to matching individual perceptions of work quality coming from the EWCS and annual employment growth (in the profile, country and year) provided by the LFS.

Socio-economic profiles are not only crucial for empirical reasons. Indeed, both labour supply and labour demand have profoundly changed during the 1995-2005 period: as regards the demand side, some industries and occupational groups have grown, other have declined; as regards the supply side, the employment rate of women and seniors have constantly increased. And these structural trends also have an impact on job quality. As an example, older workers might be more sensitive to hard working conditions (see for instance, Pollak, 2012) and younger workers to learning opportunities. With regression models, we will thus be able to check for these structural effects when explaining individual perceptions of work quality by job dynamics in the corresponding year, country, industry, occupational group, gender and age group (all these factors being equal otherwise).

Annual employment growth in the year, country and profile is defined by the LFS, which is the largest household sample survey providing annual and/or quarterly (depending on the year) individual data on labour participation of people aged 15 and over. Samples consist of tens of thousands of people, and basic concepts and definitions used in the survey follow the guidelines of the ILO, which can provide robust estimations of the total number of people working during the reference week each year and in each country. Using the very large samples of the LFS, we calculate net annual job creation / destruction rates for each socio-economic profile (*i.e.* combination of gender, age, occupational group and industry) in each country (Austria, Belgium, Denmark, Spain, France, Greece, Ireland, Italy, Netherlands and Portugal) and at each date (year $y = 1995/6, 2000$ and 2005), which is the increase / decrease between $y-1$ and y (in percentages) of number of jobs in each profile, country and year y .

Following Jouhette and Romans (2006), 1-digit ISCO occupations are condensed in five groups: agricultural, highly skilled non manual, low skilled non manual, skilled manual and elementary occupations. Seven groups of industry are distinguished, using an *ad hoc* codification of the 1-digit NACE: agriculture (common with occupations), manufacturing, construction, trade, hotels and restaurants, production and distribution of goods and services related to infrastructures (*i.e.* water, energy, transport and communication)²⁰, financial intermediation and business services, health, education and administration. The gender variable (male / female) and four classes of age (one for each decade) are also used.

²⁰ In many European countries, such industries have been highly controlled or regulated by States until recently. In a liberalisation context (Clifton, Diaz-Fuentes, 2009), job dynamics of these industries as well as work quality are susceptible to be particular, so that we decided to separate them from other good or services activities.

A job dynamics indicator, defined for each country, year and socio-economic profile ($n = 6,000^{21}$), is matched at a *meso* level with individual data on work quality of the EWCS. The total dataset has 32,771 individual observations²². Table 2 reports descriptive statistics of both job dynamics and work quality indicators by year, country, job and individual characteristics.

Table 2. Descriptive statistics of job dynamics and work quality indicators by year, country and individual and job characteristics

	Job dynamics Annual employment growth (in %)	Work quality relative to...					
		Physical working conditions	Work intensity	Autonomy	Healthy work	Learning Work	Total work quality
(Average score; 'good' = '1'; 'bad' = '0')							
Year							
<i>1995/6</i>	+ 1.92	0.81	0.64	0.72	0.70	0.65	0.70
<i>2000/1</i>	+ 4.27	0.80	0.61	0.68	0.69	0.65	0.69
<i>2005</i>	+ 2.59	0.81	0.57	0.69	0.71	0.64	0.68
Country							
<i>Austria</i>	+ 1.04	0.82	0.50	0.67	0.76	0.74	0.68
<i>Belgium</i>	+ 2.51	0.84	0.64	0.72	0.77	0.70	0.73
<i>Denmark</i>	+ 3.48	0.85	0.55	0.82	0.78	0.75	0.74
<i>Spain</i>	+ 5.72	0.78	0.64	0.62	0.62	0.52	0.64
<i>France</i>	+ 1.91	0.79	0.62	0.70	0.72	0.66	0.69
<i>Greece</i>	+ 2.39	0.71	0.54	0.62	0.52	0.49	0.59
<i>Ireland</i>	+ 6.28	0.83	0.61	0.69	0.79	0.62	0.69
<i>Italy</i>	+ 3.64	0.84	0.61	0.71	0.72	0.69	0.71
<i>Netherlands</i>	+ 1.82	0.85	0.56	0.80	0.77	0.77	0.75
<i>Portugal</i>	+ 1.84	0.80	0.67	0.65	0.63	0.60	0.68
Occupation							
<i>Agriculture</i>	- 1.62	0.66	0.60	0.71	0.56	0.53	0.62
<i>Highly skilled non manual</i>	+ 4.30	0.88	0.62	0.82	0.76	0.78	0.78
<i>Low skilled non manual</i>	+ 3.49	0.87	0.64	0.68	0.77	0.63	0.71
<i>Skilled manual</i>	+ 2.08	0.68	0.54	0.57	0.56	0.59	0.59
<i>Elementary occupations</i>	+ 2.58	0.76	0.64	0.60	0.71	0.45	0.61
Industry							
<i>Agriculture</i>	- 1.62	0.66	0.60	0.71	0.56	0.53	0.62
<i>Manufacturing</i>	+ 1.31	0.76	0.55	0.61	0.69	0.62	0.64
<i>Construction</i>	+ 4.37	0.67	0.54	0.66	0.55	0.65	0.63
<i>Trade, hotels and restaurants</i>	+ 3.23	0.83	0.63	0.72	0.76	0.61	0.69
<i>Production and distribution of goods and services related to infrastructures</i>	+ 3.12	0.78	0.55	0.59	0.61	0.61	0.63
<i>Financial intermediation and business services</i>	+ 5.49	0.91	0.58	0.79	0.80	0.74	0.76
<i>Health, education and administration</i>	+ 3.88	0.86	0.68	0.74	0.72	0.71	0.75
Sex							
<i>Men</i>	+ 2.56	0.78	0.58	0.70	0.66	0.66	0.68
<i>Women</i>	+ 3.84	0.85	0.64	0.70	0.76	0.63	0.71

²¹ $6,000 = 2$ (gender) * 4 (age) * 25 (5 occupations and 7 industries, with agriculture in common) * 10 (country) * 3 (year).

²² There are on average 5.4 different workers in each combination of socio-economic profile, country and year.

Age							
20 – 29	+ 1.17	0.80	0.59	0.64	0.73	0.64	0.67
30 – 39	+ 3.17	0.81	0.59	0.71	0.69	0.67	0.70
40 – 49	+ 3.46	0.81	0.61	0.71	0.69	0.65	0.69
50 – 59	+ 4.73	0.81	0.65	0.72	0.71	0.63	0.70
Total	+ 3.09	0.81	0.61	0.70	0.70	0.65	0.69

Job dynamics and work quality indicators are calculated as weighted means of their value for the individuals corresponding to each category in line (year, country, etc.).

Reading: in 1995/6, for each individual, employment in the socio-economic profile, country and year has increased on average of 1.92% and work quality indicator relative to physical working conditions was on average 0.81.

Field: People in employment, aged from 20 to 59 years old in ten EU countries (Austria, Belgium, Denmark, Spain, France, Greece, Ireland, Italy, Netherlands and Portugal).

Source: EWCS 1995/6, 2000/1 and 2005 matched with corresponding LFS data (n = 32,771).

Trends in job dynamics are coherent with official data (cf. European Commission, 2006 or OECD, 2006, for example). For the ten countries analysed, the highest average employment growth per socio-economic profile is observed in 2000, with Ireland and Spain characterised by a particularly high level of (net) job creation during the covered period. At the other end of the scale, Austria, Portugal, Netherlands and France have experienced less intense employment growth.

In the 1995-2005 decade, women benefited more from job creation than men. Jobs for young people increased at a lower rate than for other age groups, reflecting the fact that young people spend a longer time period in education and that their entry on the labour market has become more and more difficult. On the other hand, older workers have benefited from the greatest job increase during the analysed period, which reflects demographic trends, baby boomers entering the last class of age of our population sample. The most intense job dynamics are observed for highly skilled non manual workers followed by low skilled non manual workers while less intense ones concern skilled manual and agricultural workers. Only in agriculture²³, has there been a decrease in the number of jobs, while the greatest employment growth has been observed in financial intermediation and business services, as well as in construction.

Reported statistics on work quality are also globally consistent with that found in literature. Most difficult physical working conditions are concentrated in agriculture and construction. More generally, agricultural workers report low quality of work for all indicators except autonomy. The least autonomous are skilled manual workers, who are also concerned with high work intensity and the worst total work quality. The best work quality is observed for highly skilled non manual workers whose work is characterised by a high degree of autonomy and the presence of learning opportunities.

Concerning industry, three groups of sectors could be distinguished. The first one (financial intermediation; health, education and administration) is characterised by high total work quality (0.76 and 0.75). The intermediate position is occupied by trade, hotels and restaurants (0.69). Finally, the four remaining sectors (agriculture, manufacturing, construction, and production and distribution of goods and services related to infrastructures) are quite similar and are concerned with low quality of work (0.62, 0.64, 0.63 and 0.63). It is interesting to note that despite their positive global work quality financial intermediation and business services are characterised by quite a high work intensity (*i.e.* working at a very high speed

²³ By construction, agriculture is both an industry and an occupational group in our dataset.

and to tight deadlines): work in this sector is more intense than in agriculture or in trade, hotels and restaurants for example.

In our data, there are no strong differences of work quality indicators across age groups. The main difference concerns young workers, who are less autonomous. Gender differences are more important: men are exposed to physical nuisance and intense work more frequently than women; and they more often consider that their health or safety is at risk because of work. On the contrary, men and women are not different in terms of autonomy and learning opportunities.

Even if there may be cultural biases in declarations (see Nicoletti, 2006, for an examination of differences in job dissatisfaction across Europe) and composition effect in samples (notably by occupation and industry), Greece could be identified as the worst country in terms of work quality. For some indicators Spain is quite close to Greece (autonomy and learning work notably). And work intensity is not higher in Greece than in Austria, Denmark and Netherlands. By contrast, in these last two countries, workers seem to be the most autonomous and their work involves learning jobs.

At the European level, no significant evolution could be distinguished for physical working conditions, health and learning work. By contrast, there was an increase in intensity of work, and autonomy has slightly decreased. Finally, the total work quality has not improved during the analysed period: the average quality of work has even decreased from 0.70 in 1995 to 0.68 in 2005.

2.3. Empirical strategy

As mentioned above, our study is based on two European individual survey datasets that we have matched by socio-economic profile, year and country in order to have relevant information both on job dynamics and work quality. Analyses of the link between these two characteristics of work and employment are first conducted in a descriptive way: are jobs whose number is increasing for a given year, country, type of job and category of workforce (*i.e.* socio-economic profile) of better or worse quality than the others? But, one of our aims is not only to link employment growth and work quality but also to be able to take into account possible composition effects due to temporal, national, occupational, industrial, etc. influence on both the quality of work and job dynamics. Our methodological challenge is therefore related to the choice of econometric techniques, whose aim is to allow a correct estimation of the link given the design of the dataset we constructed.

The models²⁴ used set work quality indicators as dependent variables whereas job dynamics, *i.e.* annual employment growth in the socio-economic profile, country and year, are the independent ones. Control variables include age, gender, sector, occupation, country and year, as well as information on computer use on the job, the supervision position of the worker and the type of employment (standard, non standard, self-employed). In this way we are able to take into account not only the main socio-economic changes in the workforce and industrial patterns but also the technological and organisational innovations within the workplaces (development of non-standard work arrangements, spread of flattening organisations and technical change).

²⁴ Types of model (linear regression, binomial or ordered multinomial logit) depend of the type of work quality items or indicators to be explained (see below, III.).

The main estimation constraint due to the data design used is that, by construction, job dynamics indicators (our explanatory variable of interest) have the same value for a given combination of socio-economic profile, country and year. Our empirical strategy has thus to cope with heteroscedasticity problem. In order to obtain robust estimation for coefficients and standard errors, we incorporate the sample design information into the estimation procedure. We thus estimate linear regression / logit models taking into account stratified and clustered sample data structure²⁵.

This estimation procedure has the advantage of using sample weights in the estimation. Indeed, one of the recent questions in economic studies based on survey data is to determine whether survey weights²⁶ should be used or not (Davezies and D'Haultfoeuille, 2009). In order to check the robustness of our results we present both weighted and unweighted regression results²⁷.

The linear model²⁸ could be formulated as follows:

$$Y_{ij} = \gamma' T_j + \beta' X_{ij} + \varepsilon_{ij} \quad (1)$$

The dependent variable Y_{ij} refers to quality of work indicators (here continuous variables) taking values from 0 (lowest quality) to 1 (highest quality), with i referring to individuals and j to socio-economic profile, year and country. T_j is the corresponding annual employment growth rate (in percentages between 1996 and 1995; 2000 and 1999; 2005 and 2004). X_{ij} is a set of both individual and job-related characteristics. Individual characteristics are the following: gender, age, occupation, industry, country and year. Multi-collinearity is not a problem since the job dynamics indicator is constant only for given combinations of all the controls. Moreover, job-related characteristics, coming from EWCS, bring individual dispersion.

3. EMPIRICAL FINDINGS

3.1. A positive correlation between work quality and job dynamics...

Before presenting results of multivariate analyses, Table 3 below reports different statistics of work quality indicators according to whether there is an increase or decrease in the number of jobs in their socio-economic profile, year and country. Initial items from EWCS (in italic font below, see Table 1 for the definition) as well as indicators (in bold font below) are used. The table reveals that the quality of work is slightly, but significantly (see the column 5 below), better when job dynamics are positive in the combination of profile, year and country than when they are negative. Average scores are higher (column 1 compared to column 2) as well as percentages of workers with the highest quality of work (column 3

²⁵ More precisely we use *surveyreg* and *surveylogit* SAS procedure with year and country as strata and socio-economic profile as cluster. Note that *stratified sampling* involves selecting samples independently within strata (year and country in our case) while *cluster sampling* involves selecting clusters, which are groups of sampling units (socio-economic profile in our case).

²⁶ The EWCS weighting was carried out on the basis of the LFS, which means that its distribution by region, locality size, gender, age, industry and occupation is close to that of the LFS distribution (Paoli and Merllié, 2001).

²⁷ Davezies and D'Haultfoeuille (2009) showed in particular that weighted estimators are more robust than unweighted ones, but less accurate when unweighted estimators are consistent.

²⁸ Corresponding binomial or ordered multinomial logit model is not presented here in detail but can be obtained upon request.

compared to column 4). Finally, the last column presents rough odds ratio, derived from individual ordered logit models of corresponding work quality items and indicators on the dummy corresponding to an increase *versus* decrease in the employment profile, year and country, without any other controls. All odds ratios are higher than one and significant, indicating the positive link between good working conditions and increasing number of jobs.

Table 3. Work quality indicators according to job dynamics in the socio-economic profile, year and country

Work quality indicators	Mean		Share of jobs with highest quality		Rough odds Ratio ^o (increase vs decrease of employment)
	Increase of employment	Decrease of employment	Increase of employment	Decrease of employment	
	(1)	(2)	(3)	(4)	(5)
<i>Noise</i>	0.81	0.77	58.5	51.7	1.31***
<i>Heat</i>	0.86	0.82	64.1	57.9	1.32***
<i>Cold</i>	0.87	0.84	65.8	58.4	1.37***
<i>Smoke</i>	0.85	0.81	69.5	62.4	1.37***
<i>Toxic</i>	0.90	0.88	76.0	71.1	1.27***
<i>Pain</i>	0.67	0.64	35.0	31.4	1.16***
<i>Heavy</i>	0.78	0.75	49.2	43.9	1.22***
Physical working conditions	0.82	0.79	18.5	14.5	1.36***
<i>Speed</i>	0.61	0.59	27.9	26.5	1.06***
<i>Deadlines</i>	0.62	0.60	30.6	28.7	1.09***
Work intensity	0.61	0.60	18.8	16.9	1.09***
<i>Order</i>	0.67	0.65	67.2	64.6	1.12***
<i>Method</i>	0.71	0.69	71.1	68.9	1.11***
<i>Rate</i>	0.73	0.71	73.2	71.3	1.10***
Autonomy	0.70	0.68	55.0	52.9	1.11***
Healthy work	0.71	0.69	71.0	68.7	1.11***
<i>Monotone</i>	0.59	0.56	59.1	55.6	1.15***
<i>Learn</i>	0.73	0.71	72.6	71.3	1.07**
Learning work	0.66	0.63	45.5	42.6	1.13***
Total work quality	0.70	0.68	2.2	1.8	1.22***
<i>Number of observations</i>	<i>19,737</i>	<i>13,034</i>	<i>19,737</i>	<i>13,034</i>	<i>32,771</i>

*: 10% significant; **: 5% significant; ***: 1% significant.

^o Models estimated in the last column (separated for each line) are individual ordered logit with as dependent variable the work quality indicator in line and as only independent variable the dummy corresponding to an increase vs decrease of the number of jobs in the socio-economic profile for the year and country considered. No control variables are used.

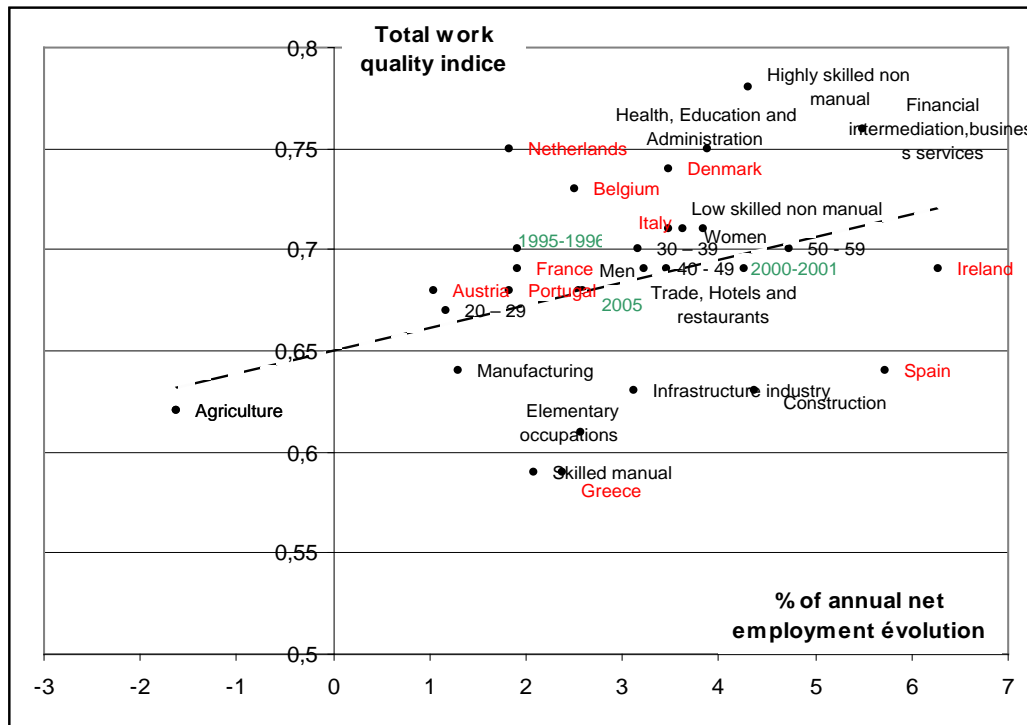
Reading: the mean of the noise indicator is 0.77 when number of jobs decreases in the profile versus 0.81 when it increases. When decreasing, 51.7% of individuals report the highest level of quality for the noise item (they never report that 'Noise is so loud that they would have to raise your voice to talk to people', cf. table 1), to compare to 58.5% when decreasing. Odds ratio corresponding to the probability of reporting a 'better' quality level for the noise indicator (cf. Table 1) in an ordered logit regression is 1.31 higher when employment increases rather than decreases.

Field: People in employment, aged from 20 to 59 years old in ten EU countries (Austria, Belgium, Denmark, Spain, France, Greece, Ireland, Italy, Netherlands and Portugal).

Source: EWCS 1995/6, 2000/1 and 2005 matched with corresponding LFS data (n = 32,771).

Another way to visualise the relationship between job dynamics and quality of work is to link the global work quality indicator and the job evolution as it is shown in Graph 1. The total work quality indicator is on the vertical axis with higher values indicating better quality while the percentage of annual net job creation is on the horizontal axis.

Graph 1. The relationship between total work quality indicator and annual employment growth



Field: People in employment, aged from 20 to 59 years old in ten EU countries (Austria, Belgium, Denmark, Spain, France, Greece, Ireland, Italy, Netherlands and Portugal).

Source: EWCS 1995/6, 2000/1 and 2005 matched with corresponding LFS data (n = 32,771).

The link between the two indicators is globally positive indicating, as previously in Table 3, the positive association between work quality and job dynamics. However, we could identify job and individual characteristics, as well as countries for which job growth is at a high level but quality of work is low or, on the contrary, for which quality of work is high but job growth is at a low level. The former group is situated under the line in the lower right hand part of the graph. For example, Greece, Spain and Ireland are characterised by intense employment dynamics but quality of work is clearly lower than in other countries. Infrastructure related industry and construction are also sectors with a high annual level of net job creation but low average work quality indicator. On the contrary, job dynamics have been very modest in the Netherlands and Belgium but the quality of work is high. The graph also shows the best and worst performances in terms of quantity and quality. Agriculture, manufacturing and Austria involve both weak job dynamics and low quality of work while highly skilled non manual workers and financial intermediation and business services industry benefit from both strong employment increase and high work quality. Finally, one can note that, excepted for young people, demographic characteristics are situated mostly around the line meaning that the possible negative trade-offs between quality of work and job dynamics may not be strongly associated with these characteristics but more probably with industry and occupation.

Descriptive statistics presented here suggest that notably through structural change (upgrading skills, growing of tertiary economy in particular) there is globally no negative trade-off between quality of work and job quantity in Europe: whatever the work quality dimension considered and the measurement retained, the link is positive with the annual net

job creations. However, Table 3 and Graph 1 report unconditional results: on average the quality of work is higher in profiles, year and country where the number of jobs is increasing. But one cannot know whether such a conclusion is only due to composition effect – for instance because of the rising number of highly skilled jobs whose quality is good, as we have seen – or reflects a positive association, all other things being equal. Regressions with structural variables as controls can go a step further, taking into account composition effects such as shifts in industries and occupations, socio-demographic and employment characteristics as well as the spread of ICT.

3.2. ...But possible trade-offs between quality of work and job dynamics

Table 4 below presents the coefficients of the job dynamics indicator when explaining different quality of work indicators and overall work quality indicator using heteroscedastic OLS estimation (as indicated above). Each cell of the table refers to a different model: quality indicators are the dependent variables; the first two columns (1 and 2) report the estimated coefficients of job dynamics variable when controls are not included; the last two columns (3 and 4) report the same coefficients but with estimations comprising the range of variables for individual and job characteristics as controls. Differences between columns 1 and 2, and 3 and 4, are linked to the use of weights.

Table 4. Heteroscedastic OLS estimations of the link between work quality and job dynamics indicators

Work quality indicators	Without controls		With controls	
	<i>Unweighted</i>	<i>Weighted</i>	<i>Unweighted</i>	<i>Weighted</i>
	(1)	(2)	(3)	(4)
Physical working conditions	0.023**	0.049***	-0.009	-0.007
Work intensity	0.009	0.012	-0.012	-0.032**
Autonomy	0.013	0.035	-0.002	-0.002
Healthy work	0.022	0.029	-0.002	0.008
Learning work	0.006	0.033	0.012	0.023
Total work quality	0.013	0.032**	-0.003	-0.004

* - significant at 10% level; ** - significant at 5% level; *** - significant at 1% level

Field: People in employment, aged from 20 to 59 years old in ten EU countries (Austria, Belgium, Denmark, Spain, France, Greece, Ireland, Italy, Netherlands and Portugal).

Source: EWCS 1995/6, 2000/1 and 2005 matched with corresponding LFS data (n = 32,771).

The estimation results of models without controls confirm the descriptive statistics reported in Table 3, with a weaker significance probably due to the difficulty of summarising the different dimensions of work quality through linear indicators. All coefficients are positive between quality of work and job dynamics and the link is significant for physical working conditions and total work quality (weighted regression).

The last two columns present the results for full model with structural and job-related characteristics. The question we investigate is whether control variables could roughly account for the positive link between good working conditions and job creation observed in the descriptive statistics. The answer is yes: for most work quality indicators the coefficient

of employment growth becomes negative and not significant after adding the explicative variables (industry and occupation play a major role in attenuating the relationship²⁹). Moreover, for work intensity indicators (weighted regression) there is a significant negative relationship between quality of work and job dynamics. It means that an increasing number of jobs in a socio-economic profile, year and country is *caetera paribus* linked to worse quality of work in terms of intensity: given a country, a year, an occupational group, an industry, age and gender, jobs whose number is increasing involve more than the others to work at a very high speed or to tight deadlines.

In other words, once we have checked for the composition effect due to the renewal of productive base, the evolution of the skill structure of jobs, the demographic change of the labour force (and also other job characteristics such as the development of non-standard work arrangements or the spread of flattening organisations and ICT), the positive correlation between job dynamics and quality of work disappears. Otherwise all these characteristics being equal, there is even evidence of a negative ‘trade-off’ between intensity of work and net job creation.

3.3. Is there evidence of a polarisation of work quality?

The previous results suggest that synergy between job dynamics and quality of work is only due to structural changes (occupation, industry, workforce characteristics). But statistical associations that we have observed yield under a linearity assumption: they may hide different realities within labour markets and a polarisation of jobs in particular. The literature uses the hypothesis of job polarisation in different contexts. It can refer to special labour market dynamics with the highest employment growths in the highest- and lowest-wage occupations: as we have noted above, this pattern of employment expansion has clearly been found in the Netherlands and France for the period between 1996 and 2006 (Eurofound, 2008). In studies on the impact of technological changes on the labour market, job polarisation has been explained by a ‘routinization’ hypothesis: technology can replace human labour in routine tasks – tasks that can be expressed in step-by-step procedures or rules – but cannot replace human labour in non-routine tasks (Goos and Manning, 2007). It results in a hollowing out of middle class occupations that require routine manual and cognitive skills. For our analysis, the job polarisation hypothesis would mean that both ‘good’ and ‘bad’ quality jobs are developing at the expense of middle-quality jobs.

This hypothesis is examined in Table 5, where coefficients for job dynamics in weighted (simple) logit regressions estimating ‘good’ (resp. ‘bad’) work quality jobs *versus* ‘median’ ones are reported³⁰. For each quality of work dimension, positive coefficients both for good and bad work quality (*versus* median one) would mean that job creation would be more important for these two quality of work extremes compared to the median quality jobs.

Only for physical working conditions, the results of Table 5 give evidence of a possible job polarisation pattern³¹. Indeed, the last two columns (weighted estimation with controls) report positive coefficients for both ‘good’ and ‘bad’ quality work indicators. However, the

²⁹ Not shown here but available on demand.

³⁰ For each work quality indicator, ‘good’ and ‘bad’ quality categories have been defined according to the observed distribution of indicators: they correspond to pseudo-quintiles.

³¹ Results of unweighted regressions are similar to that of weighted regressions presented in Table 5.

coefficient is not significant in the first case. These findings suggest that in general the absence of average significant relationship between quality of work and job dynamics could not be explained by a polarisation process. Besides, the negative and significant average link between work intensity and employment growth (Table 4, last column, second line: -0.032) can be explained by an increasing number of high intensity jobs (Table 5, last column, second line: 0.169) and a declining number of low intensity ones (Table 5, third column, second line: -0.020).

Table 5. Heteroscedastic logit coefficients for job dynamics in logit regression estimating 'good' and 'bad' work quality (versus median one)

Work quality indicators	Coefficients for job dynamics in logit models for...			
	<i>(weighted, without controls)</i>		<i>(weighted, with controls)</i>	
	... Good (vs median)	... Bad (vs median)	... Good (vs median)	... Bad (vs median)
Physical working conditions	0.645***	-0.232	0.156	0.272**
Work intensity	0.199	-0.008	-0.020	0.169
Autonomy	0.054	-0.255	-0.101	-0.128
Learning work	0.089	-0.230	0.053	-0.205
Total work quality	0.140	-0.341*	-0.080	0.035

* - significant at 10% level; ** - significant at 5% level; *** - significant at 1% level

Field: People in employment, aged from 20 to 59 years old in ten EU countries (Austria, Belgium, Denmark, Spain, France, Greece, Ireland, Italy, Netherlands and Portugal).

Source: EWCS 1995/6, 2000/1 and 2005 matched with corresponding LFS data (n = 32,771).

3.4. More and worse jobs, but where?

Table 6 below presents heteroscedastic OLS estimations of the 'net' links between work quality indicators (dependent variables) and job dynamics (independent variables) separately by year, country, occupation, industry and demographic characteristics. Each cell thus refers to a separated model estimated with all controls used except the one defining the field of the analysis and reports the corresponding job dynamics coefficient. Bold coefficients highlight significant relationship between quality of work and job evolution and the sign of coefficients tells us whether there are tensions (negative sign) or synergies (positive sign) between quality and quantitative sides of employment.

Considering the total work quality (last column), negative trade-offs between quality of work and employment growth job evolution are observed in Austria and Belgium, for agricultural workers and elementary occupations, for workers occupied in production and distribution of good and services related to infrastructures as well as in health, education and administration and finally, for young people (20-29 years old). It could mean either that jobs whose number is increasing are of bad quality of work compared to jobs whose number is declining or, on the contrary, that jobs whose number is declining are of better quality of work than jobs whose number is increasing. In the two cases, which are non exclusive, we are faced with labour markets dynamics unfavourable to work quality, *i.e.* with tension between quality of work and job creation.

Table 6. Heteroscedastic OLS estimations of the link between work quality indicators and job dynamics (separated models by year, country, etc.)

	Coefficients in separated regressions (weighted, with controls) in line and column					
	Physical working conditions	Work intensity	Autonomy	Healthy work	Learning Work	Total work quality
Years						
<i>1995–1996</i>	-0.016	-0.013	-0.001	-0.008	0.010	-0.005
<i>2000–2001</i>	-0.013	-0.064*	0.019	-0.017	0.055*	-0.001
<i>2005</i>	0.026	-0.036	-0.010	0.106*	0.012	-0.002
Countries						
<i>Austria</i>	-0.015	-0.038	-0.080	0.030	-0.038	-0.043*
<i>Belgium</i>	-0.015	-0.099***	-0.063	0.042	0.031	-0.037*
<i>Denmark</i>	-0.004	-0.021*	0.026**	-0.035	-0.001	-0.000
<i>Spain</i>	0.006	-0.042	0.049	0.072	0.019	0.008
<i>France</i>	-0.012	-0.012	-0.027	0.014	0.055	0.001
<i>Greece</i>	-0.022***	-0.032*	0.019	-0.049**	-0.003	-0.009
<i>Ireland</i>	0.003	-0.007	0.083	0.096	0.067	0.037
<i>Italy</i>	0.002	-0.064	0.063	0.067	0.045	0.011
<i>Netherlands</i>	-0.036*	-0.059	-0.030	-0.070	-0.014	-0.035
<i>Portugal</i>	-0.002	0.051*	-0.078*	-0.030	0.048	0.005
Professions						
<i>Agriculture</i>	-0.052	-0.077	-0.261	0.197	-0.157	-0.137*
<i>Highly skilled non manual</i>	0.004	-0.096**	-0.019	0.102*	-0.008	-0.026
<i>Low skilled non manual</i>	-0.012	0.009	-0.007	-0.020	0.025	0.004
<i>Skilled manual</i>	-0.003	-0.003	0.045*	-0.006	0.029	0.017
<i>Elementary occupations</i>	-0.032	-0.035	-0.049	-0.011	-0.025	-0.035*
Sectors						
<i>Agriculture</i>	-0.052	-0.077	-0.261	0.197	-0.157	-0.137*
<i>Manufacturing</i>	0.006	-0.018	0.010	0.058	0.087	0.021
<i>Construction</i>	0.012	0.029	0.034	0.014	0.003	0.020
<i>Trade, hotels and restaurants</i>	-0.003	-0.029	-0.017	0.010	0.050	0.000
<i>Production and distribution of good and services related to infrastructures</i>	-0.026	-0.057*	-0.011	0.036	-0.050	-0.036*
<i>Financial intermediation and business services</i>	0.058***	0.005	0.023	0.129**	0.107***	0.048*
<i>Health, Education and Administration</i>	-0.046**	-0.087**	-0.030	-0.042	-0.025	-0.047**
Sex						
<i>Men</i>	-0.011	-0.054*	-0.019	0.012	0.011	-0.018
<i>Women</i>	-0.009	-0.010	0.015	-0.009	0.038*	0.009
Age						
<i>20 – 29</i>	-0.038**	-0.094**	-0.049	-0.063	-0.026	-0.052***
<i>30 – 39</i>	-0.011	-0.031	0.018	-0.015	0.014	-0.003
<i>40 – 49</i>	-0.010	0.020	-0.004	0.081	0.039	0.011
<i>50 – 59</i>	0.032	0.003	0.029	0.089	0.073	0.034

The coefficients refer to job evolution in percentages in socio-economic profile

* - significant at 10% level; ** - significant at 5% level; *** - significant at 1% level

Field: people in employment, aged from 20 to 59 years old in ten European countries

Source: EWCS 1996, 2000 and 2005 (after matching with LFS data).

Graph 1 (see above) gives some indications which help us understand these 'tensions'. In Belgium and globally in health, education and public administration sectors, work quality is higher than average, and employment growth is rather weak suggesting trade-offs in favour of work quality³². In infrastructure and manufacturing industries and for elementary occupations, the inverse situation is observed suggesting this time trade-offs in favour of employment quantity. In Austria, in agriculture and for young workers, quality and quantity are both lower than on average providing no clear indication on the way trade-offs are resolved.

Analyzing the different quality of work indicators we can see that negative trade-offs are mostly observed for physical working conditions and work intensity. In Belgium, Denmark and Greece, jobs whose number is increasing are more intense than jobs whose number is declining. The same is true for highly skilled non manual workers, production and distribution of goods and services related to infrastructures, health, education and public administration, men and youth.

The sector of financial intermediation and business services is characterized by synergies between quality of work and employment quantity: all coefficients are positive and for physical working conditions, healthy and learning work as well as for total work quality the relationship between quality of work and job creations is significant. Synergies are also observed for highly skilled non manual workers in terms of 'healthy work', for skilled manual workers in terms of work autonomy and for women in terms of 'learning work'.

The situation of young people should be underlined. All coefficients are negative for workers aged between 20 and 29 and this negative relationship is significant for physical working conditions and work intensity. All other things otherwise being equal, jobs of young workers are of worse quality when their number is increasing and of better quality when it is decreasing. This category of workforce may thus be one of the solutions found by economies in regulating quantity and quality of work and employment in the EU labour markets. Surprisingly, nothing similar has been observed for women. In fact, they may also have in some cases 'more and worse' jobs, but certainly because of other aspects of job quality: low wages, involuntary part-time and limited contracts (Burchell *et al.*, 2007).

4. CONCLUSIONS

In this paper, we provide a micro-econometric analysis of the relationship between quality of work indicators and employment dynamics in ten European countries over the period 1995-2005. Starting with the observation of strong job growth in most European countries during the decade, we also pointed out the stagnation of perceived quality of work in the same time-period. Such trends seem to be a paradox in Europe where the objective of 'more and better jobs' is at the heart of the Lisbon Strategy for the construction of a future knowledge-based European Society.

Given the global consensus of empirical literature in favour of the 'more and better' thesis, two hypotheses have been studied: first, do job dynamics play a role as a specific (co-) determinant of work quality? In other terms, are jobs whose number is rising of better or worse quality than those whose number is diminishing when structural effects (renewal of productive base and workforce, technological and organisational change) are taken into

³² This can only be formulated as an hypothesis here since a rigorous proof of such trade-offs would require longitudinal data.

account? Second, are there pieces of evidence in favour of a ‘job polarisation’ hypothesis, *i.e.* strongest employment growth concerning both lowest and highest work quality? To complete previous studies, one could finally question whether there were countries, types of jobs or categories of working population for which there was a negative correlation between employment increase / decrease and quality of work (for example, youth or less skilled workers)?

For this analysis, we have matched two European data sources – the Labour Force Surveys (LFS) and European Working Conditions Surveys (EWCS) – by country, year and socio-economic profile, which has been defined by combining gender, age, occupation and industry. Our empirical strategy relies on a quality definition close to work content with possible consequences on health and career and takes into account complex sample design of data in the estimation procedures.

Our results show that when reasoning on an unconditional level there is a positive relationship between quality of work and employment growth. However, this relationship disappears when structural effects (occupation, industry, demographic and job related characteristics) are taken into account. We find that after controlling for these effects, jobs whose number is increasing are not necessarily of better quality than jobs whose number is declining. In particular, there is a ‘net’ negative relationship between employment growth and work of high intensity. It means that synergies between quality of work and job dynamics are mostly explained by positive structural dynamics and that ‘tensions’ or ‘negative trade-offs’ are found once structural change is taken into consideration.

Even if there is no clear evidence of a global polarization process of work quality, trade-offs between job quantity and quality of work are unevenly spread across countries, individual and job characteristics. Agricultural, low skilled and young workers, individuals working in sectors related to infrastructures or education, health and public administration as well as living in Austria and Belgium are particularly concerned.

Job dynamics are not the main reason for the stagnation of work quality observed in European countries during the 1995-2005 decade. Due to structural evolution of labour supply and demand, employment creation / destruction has played a positive role in the trends of quality of work. But at the same time, given an industry, occupation, age and sex group, negative trade-offs between quality and quantity may have occurred in some countries and for some aspects of work content. Our data do not explain the reasons for such trade-offs. To what extent are they due to firm choices, for example because of more profitable ‘low-road’ strategies, for real or from the firm’s perspective? For some firms, gains of the ‘high-road’ employment practices might not offset the costs. And, as shown by Bloom and Van Reenen (2010), management practices are considerably variable reflecting sometimes sub-optimal employer strategies. Do such choices depend of international competition, technological progress, public policies?

All these questions lead to further analyses in which globalisation, technology or policy effects would be identified. For instance, do the different national, regional, or industrial legislation on health and safety play a role when analysing the relationship between work quality and employment growth? Besides, the major crisis experienced since 2008 could be a helpful means of observing the parallel trends of job quality and quantity in Europe.

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