



Gender Gaps in Working Conditions

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Abstract

The evolution of the gender pay gap has received a great deal of attention from academia and public opinion alike, yet our understanding of the differences in non-monetary working conditions is much scarcer. Through the use of the European Working Conditions Survey and six composite indicators of job quality, this research aims to expand our knowledge on the gender gaps in job attributes across the European Union over the period 2005–2015 in three ways: firstly, we explore gender differences in working conditions, revealing the distinct patterns identified by the dimensions of job quality and country; secondly, we find that, on average, women's relative position deteriorates in terms of the physical environment and working time quality; a result that again reflects considerable heterogeneity across the countries in the sample. Lastly, we find clear evidence of a catch-up process in job quality in all the non-monetary dimensions of working conditions across the European Union.

Keywords Gender gap · Working conditions · Job quality · Europe

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1 Introduction

The study of wage differences between sexes, or gender wage gaps, is a major area of research in Labour Economics (Blau & Kahn, 2017; European Commission, 2018; Weichselbaumer & Winter-Ebmer, 2005). Not only has inequality between males and females become a core concern for public opinion, but also European Union (EU) citizens believe that the political authorities should consider it a major priority (European Commission, 2015).¹

Paradoxically, gender differences in other dimensions of working conditions have received less attention, especially from an overall aggregate perspective. This neglect is hardly excusable for several reasons: different sources, such as the International Social Survey Programme, highlight the importance of certain attributes besides wages in the definition of what makes a good job (Muñoz de Bustillo et al., 2011b; Nikolova & Cnossen, 2020), such as job security, the intrinsic interest of work, opportunities for career advancement and a flexible timetable. In fact, some of them, such as job security or being able to work independently, are considered by workers in many countries to be as important or even more so than wages. In a similar fashion, low job quality can harm mental health more than underemployment (Wang et al., 2022). A recent study by Maestas et al. (2018) provides solid evidence of how workers effectively value non-monetary working conditions and are willing to trade labour income for improvements in other dimensions. Furthermore, women seem to have stronger preferences for non-wage amenities than males (Ledić & Rubil, 2021; Maestas et al. (2018)). Therefore, in order to gauge the position of men and women in the labour market, the perspective of gender gap should be extended to other dimensions of working conditions.²

This paper adopts a broader approach to the gender gap by focusing on the relative position of men and women in six dimensions of job quality (physical environment, work intensity, working time quality, social environment, skills and discretion and prospects) across the EU over the period 2005–2015. These six dimensions provide a comprehensive portrayal of non-monetary attributes with a direct impact on workers' wellbeing (Muñoz de Bustillo et al., 2011b). The aim is to improve our knowledge of gender gaps in working conditions in the EU in three ways: firstly, we map the existing gender differentials in the abovementioned dimensions for EU-28 (including the UK); secondly, we explore whether there have been any significant changes over the period 2005–2015 and finally, we investigate whether gender gaps have narrowed in these dimensions in the EU. Specifically, we explore whether any changes in the gender gap are negatively correlated with our starting point (i.e., countries with a larger gap would tend to record reductions or smaller improvements than those with narrower ones). This involves what Economic Growth Theory refers to as β -convergence.

¹ According to the Eurobarometer (European Commission, 2017), 91% of Europeans believe that gender equality is important to ensure a fair and democratic society and 87% consider it is important for the economy.

² The importance of studying gender gaps in working conditions and the theory of compensating differentials do not conflict. The latter postulates that lower job quality in one specific dimension of working conditions, such as wages, could be partly or fully offset by better conditions in one or more other dimensions (Kahn, 2008). The absence of perfect competition in European labour markets calls the practical application of this theory into question (Bonhomme & Jolivet, 2009), suggesting that actual job matches do not necessarily fully reflect workers' preferences and productivity. Nevertheless, as long as working conditions inform personal well-being, and individuals are willing to accept improvements in one dimension in detriment to another, the importance of studying the topic remains unchanged.

As noted, the analysis of the gap in wages has accounted for most of the research into the differences in working conditions from a gender perspective, as well as focusing public attention.³ In contrast, we find relatively few contributions to the analysis of gender differences in working conditions from a wider perspective, including all or most of the relevant dimensions of job quality.

Despite a trend towards greater equality in our societies, the convergence of the gender gap in job quality is not clear. On the one hand, universalist theories share the view of a convergence of job quality across countries and employment systems due to similar changes in the nature of work in developed societies (Gallie, 2007). As argued by Mühlau (2011, p. 144), “the job profiles of men and women are not more similar in societies with gender egalitarian norms”, reinforcing the notion of a “Welfare State paradox” (Mandel & Semyonov, 2006).⁴ This view is supported by evidence on institutional convergence across the EU based on the Worldwide Governance Indicators, the product market regulation indicator of the Organisation for Economic Co-operation and Development (OECD) and the World Bank Doing Business index (Schönfelder & Wagner, 2019).⁵

On the other hand, a different literature stream argues that working conditions vary according to institutional and cultural frameworks, thus curbing their polarisation, as Mústosmaki et al. (2017) illustrate for Finland. The bulk of this body of research seeks to explain why women hold lower quality jobs than men, which also casts some doubt on the notion of compensation for lower pay and upward occupational mobility. We should also mention the study by Glass (1990), whereby occupational sex segregation is the main cause of the gender gap observed in attributes such as unsupervised break time, fairness of promotion policies and job flexibility; in turn, Stier and Yaish (2014) use cross-country data from the International Social Survey Programme to contend that the gender gap in job quality decreases with higher female participation rates.

Beside this literature, different scholars have focused on certain specific dimensions of working conditions from a gender perspective, although very rarely covering the full spectrum. For example, Boll and Bublitz (2018) have used data from the European Union Labour Force Survey for Germany, Italy and the Netherlands to study the incidence of work-related training from a gender perspective in relation to household earnings, finding lower training hours for female employees working part-time in Germany (but not in Italy or the Netherlands). The gender gap in firm-provided and on-the job training is also addressed by Burgard and Görlitz (2014), Grönlund (2012), Knoke and Ishio (1998) and O’Halloran (2008), among others. The dimension of working time quality has been explored recently from the gender perspective in a special issue of *Social Indicators Research* (Chung & Van der Lippe, 2018), focusing on the need to study the “small

³ For example, while broadening the key areas for monitoring equality beside the gender pay gap, the *European Commission 2019 Report on Equality between women and men in the EU* focuses solely on increasing female labour market participation and promoting equality in decision-making.

⁴ The paradox is that those welfare state policies that help to increase female labour force participation do so at the expense of “a high concentration of women in female-typed occupations” with lower job quality “and low female representation in managerial occupations”.

⁵ The World Bank’s Worldwide Governance Indicators (Kaufmann et al., 2011), provide data on six dimensions of governance (voice and accountability, political stability and absence of violence/terrorism, government effectiveness, regulatory quality, rule of law and control of corruption). The Product Market Regulation Indicators, administered by the OECD (2022), measure the degree to which country-level institutional and policy settings foster or inhibit competition in those areas where competition is feasible. The World Development Indicators include a wide range of internationally comparable statistics on global development and the fight against poverty (World Bank, 2022).

print” of flexible time arrangements considering the role of context to capture the gender implications of different schedules.

Gender differences in non-standard employment, including temporary work (related to our dimension of prospects), have been addressed by numerous researchers (e.g., Addabbo & Favaro, 2011; International Labour Office, 2017; Petrongolo, 2004). Autonomy at work, another of the important indices of working conditions, has been explored from a gender perspective by Adler (1993), concluding that the gender gap in this dimension responds more to the leadership position at work than to the gender composition of occupations. At international level, Yaish and Stier (2009) report a positive association between the levels of female concentration in the public sector and the gender gap in leadership.

Gender inequalities in occupational health (Campos-Serna et al., 2013; European Agency for Safety and Health at Work—[EASHW], 2003) are another area of concern. The meta-analysis by Campos-Serna et al. (2013, p. 7) concludes that “women have greater feelings of high job insecurity, worse contractual working conditions and psychosocial work environment”, while men are more “exposed to long working hours, high physical demanding work, noise, effort-reward imbalance”. The EASHW report focuses on the differences in risks and health outcomes between men and women at work, with higher rates of stress and upper limb disorder among women and noise/hearing loss or the consequences of heavy lifting among men. The literature on the relationship between stress and gender is somewhat contradictory, as there are studies that do not observe gender differences in this regard (e.g., Nelson & Burke, 2002); others suggest that men experience higher levels of work-related stress, while most studies find a higher level of stress among women (Cifre et al., 2015). With respect to these indicators, Lindley (2015), for the case of the UK and in tune with feminist theories, argues that gender differences in work intensity and speed are not significant upon entry into the labour market, but increase over the life cycle.

The recent study by Ledić and Rubil (2021) is an original way of addressing job quality gender gaps through the derivation of an equivalent wage gap based on workers’ preferences over job attributes, as revealed through the impact that different non-wage job amenities have on job satisfaction. Their contribution to the literature is mainly methodological, although they illustrate the application of their approach to compute a total equivalent wage gap (only in raw terms) using two cross-sectional surveys of recent European graduates. There is, therefore, hardly any overlap between their contributions and our own. Overall, their findings reflect differences across countries, suggesting that women tend to face a penalty in terms of career prospects, the possibility of gaining more knowledge learning and facing new challenges and work autonomy, while their position, at least without controlling for any covariates, is better than their male counterparts when considering variables related to the work-life balance and their job’s perceived usefulness for society.⁶

Considering a more general approach involving different job amenities—non-monetary attributes—and based on United States data from the American Working Conditions Survey, Maestas et al. (2018) conclude that men and women hold jobs with a different mix

⁶ Apart from the focus by Ledić and Rubil (2021) on theoretical insights, their work differs from ours in different ways. First of all, the empirical part of the work intends to provide a practical example of their contribution. In particular, they compute the raw equivalent wage gap by gender (without adjustment for covariates) using a sample of European graduates from 19 countries between 2005 and 2008; that is, young people with higher education, who account for a relatively small share of total employment. As their aim is a different one, they do not look at how the gap evolves over time, the drivers of such changes, or the existence of convergence. Secondly, for the same reasons due to the scope of the paper, they consider only nine non-wage characteristics (our study comprises 46).

of attributes and that, considering the willingness-to-pay for most of such amenities, the wage gap by gender narrows, while the pay differential by race and age widens. In short, “accounting for amenities exacerbates measured wage inequality” (Maestas et al., 2018, p. 5).

In sum, there are numerous studies analysing specific aspects of working conditions from a gender perspective, but very few that consider such differences in a comprehensive and integrated manner, which is precisely the aim here.

Our results suggest that the gender gap varies substantially across the different dimensions of job quality. In particular, and all other things being equal, female workers face a significant disadvantage in the dimensions of skills and discretion and prospects, while enjoying better conditions in terms of physical environment, working intensity and working time quality. We do not find any differential in the dimension of social environment.

From a dynamic perspective, women’s working conditions deteriorate in the dimensions of physical environment and working time quality. On average, there are no significant variations in the other dimensions, although the figures at EU level reflect considerable heterogeneity across countries. Overall, these developments indicate a clear process of β -convergence.

The rest of the paper unfolds as follows. Second section provides the theoretical framework for this study, whereas third section describes the database and the methods used for measuring the scope and evolution of gender gaps in non-monetary working conditions and for assessing the convergence in these magnitudes across the EU during the period 2005–2015. We present the main results of our analyses in the fourth section, while the last one summarises the main contributions of this research.

2 Background

As mentioned, the purpose of this research is of an empirical and applied nature: the measurement and assessment of gender gaps in working conditions across European countries over the period 2005–2015. As mentioned in the first section, previous works on this topic are relatively scarce.

Nevertheless, since male–female differences in labour market outcomes—particularly, employment, earnings and occupational attainment— have attracted so much attention from academics (Altonji & Blank, 1999; Bertrand, 2011; Blau & Kahn, 2017), it is possible to frame the motivation of our paper within such previous theoretical and empirical literature, even if its relationship with non-pecuniary job attributes is quite weak and this topic presents several specificities on which we comment.

Overall, the existence of gender gaps in the labour market might obey to different non-mutually exclusive types of explanations that often interact with each other: workers’ preferences, non-equal treatment and institutions. These features might change both across countries and over time.

First, as in other domains (Croson & Gneezy, 2009), males and females might have different preferences over jobs, i.e., they can value certain job attributes in a different way (Cortés et al., 2021; Ledić & Rubil, 2021; Maestas et al., 2018). In this line, a non-negligible amount of literature suggests that occupational segregation might respond to this explanation. As *de gustibus non est disputandum*, it is difficult to predict to which extent existing differences across countries and over time have to do with preferences

variation. The theory of compensating differentials, mentioned above, represents itself a story about the relevance of preferences. Related research that highlights the role of gender-specific personality traits on the gender pay gap (Otten, 2020), even if culture and society model both their formation and valuation.

In the second place, traditionally, Social Sciences literature, especially from Feminist theory, has emphasized the role of employers' discriminatory behaviour in gender gaps in labour market outcomes, like the occupational segregation itself (Reskin, 1993; Reskin & Bielby, 2005; Walby, 1986; Williams & Rubin, 2003). Nevertheless, recent comparative experimental studies show that the existence and the extent of these sorts of attitudes might be lower than often assumed and can substantially differ across national contexts (Birkelund et al., 2022). In this respect, although economists tend to assume that the increase in the degree of competition in European product and labour markets should gradually contribute to reduce the gender gaps due to this element (Weichselbaumer & Winter-Ebmer, 2007; Winter-Ebmer, 1995), in practice, we do not have much theoretical ground on which we can set a convincing hypothesis its evolution.

The third broad type of explanation has to do with institutions. Labour market interventions, from the form of wage bargaining to equal treatment and non-discrimination laws, might shape the magnitude of gender gaps (Hyland et al., 2020; Manning, 2003; Weichselbaumer & Winter-Ebmer, 2007). Our knowledge on the effect of these kinds of institutional arrangements on pay gap is limited and a consensus is lacking (Caliendo & Wittbrodt, 2022; Bargain et al., 2019; Kahn, 2015; Neumark & Stock, 2006; Oostendorp, 2009; Panizza & Quiang, 2005; Schäfer & Gottschall, 2015), mainly because reductions in the gender pay gap might come at the expense of lower female employment.

Furthermore, some relevant established facts hardly fit only one of the broad types of explanations outlined below. For instance, it is relatively well-known that the presence of women in scientific jobs is much more intense in Eastern European countries than in Western ones (The Economist, 2019), and differences between West and East Germany run in the same direction (Lippmann et al., 2020). Indeed, institutions might have shaped societies' preferences and beliefs (Booth et al., 2019; Fuchs-Schündeln & Schündeln, 2020). Renowned voices like Goldin (2021) highlight that the main driver of the gender wage gap is the fact that women tend to choose jobs which allow more flexibility to deal with family issues. She presents the change occurred in the American pharmaceutical sector (where the earnings gap is virtually inexistent thanks to measures making this type of flexibility mandatory) as paradigm for achieving equality. Naturally, agreeing in the specific nature of this claims is not obvious. E.g., one can see family issues as a matter of preferences and constraints and other institutions, such as family policy, might shape its relevance (Kleven et al., 2019). The potential impact of the increasing qualification and labour market attainment of women could also fall in this category (Weichselbaumer & Winter-Ebmer, 2007). Finally, whereas market orientation could lower gender pay gaps (Zweimüller et al., 2008), the impact of globalization is not so clear (Oostendorp, 2009).

On top of the elements mentioned above, non-pecuniary working conditions show some peculiarities when compared with pure monetary compensation. In the case of non-pecuniary job attributes, preferences might play a larger role than in wages (who probably everybody should value similarly). Furthermore, as most of the aspects workers value are costly for firms to provide (Clark, 2015), it is possible that there might exist trade-offs between policy measures mandating non-monetary benefits and employment, as in the case of the wages (Kahn, 2015), or between different parts of the compensation package (Clemens et al., 2018).

All in all, the study of non-pecuniary working conditions clearly fits existing research, but to devise the evolution of such features across countries and over time on the basis of this literature is a virtually impossible exercise and constitutes an empirical issue.

Disentangling the role of each of the possible drivers, many of which might be potentially endogenous, is likely to deserve an individual and separate analysis. This is not the purpose of this paper. Such a task would be indeed unfeasible in these pages, not only because of the length constraints, but also, and more importantly, because of data problems. Apart from the need of collecting harmonized information on these dimensions, the number of countries available for our analysis (which is the relevant level of variation of the potential explanatory variables) is well below the minimum required for sound statistical inference, usually established around 50 (Angrist & Pischke, 2008; Bryan & Jenkins, 2016; Oshchepkov & Shirokanova, 2022).

Regarding convergence, to the best of our knowledge, there is no theoretical background for predicting convergence or divergence in this dimension. Nevertheless, there are several reasons for convergence of the gender gap in working conditions.

The first argument involves a process of harmonising institutional frameworks in the age of globalisation, especially in a context of intense regional integration such as the EU. There is a raft of literature that supports the hypothesis that labour market regulation is becoming increasingly similar across countries (Davies & Vadlamannati, 2013; Duanmu, 2014; Gahan et al., 2012; Hefeker & Neugart, 2010; Mehmet, 2006; Obadić et al., 2021),⁷ and this also applies to a certain extent to welfare state arrangements (Arts & Gelissen, 2010; Bouget, 2006; Obinger & Starke, 2014), which help to shape work outcomes. The EU's growing involvement in the social arena might well reinforce this trend (Vaughan-Whitehead & Vázquez, 2019). Finally, and in contrast to income, some indicators of job quality face natural upper limits, as in the case of life expectancy and the educational variables considered in the assessment of convergence in multidimensional indicators of wellbeing (Jordá & Sarabia, 2015; Mayer-Foulkes, 2012; Mazumdar, 2002; Noorbakhsh, 2007; Ortega et al., 2016). For instance, it is perfectly reasonable to consider working environments without any biological and chemical risks or with full job discretion. Regulations and social customs are very likely to reinforce this effect: overall, the number of regulations affecting non-monetary working conditions by far exceed the ones affecting earnings. In fact, the inequality in the provision of non-monetary job amenities is significantly lower than in the case of wages (e.g., working hours) (Green et al., 2013; Muñoz de Bustillo et al., 2011a). Lastly, it is also reasonable to expect that countries with larger gaps have more room for improvement and for affirmative actions, even if this solely

⁷ The enactment of a number of European directives encapsulates this process. For example, in the area of Health and Safety alone (dimension 1 in our job quality model), there are nearly 40 directives related to workplace and equipment issues, chemical products, carcinogens and mutagens, biological agents, physical hazards, ergonomics, etc. Other important directives with implications for job quality are *Directive 2003/88/EC of the European Parliament and of the Council of 4 November 2003 concerning certain aspects of the organisation of working time* (Directive 2003/88/EC), *Directive (EU) 2019/1158 of the European Parliament and the Council of 20 June 2019 on work-life balance for parents and carers* (Directive 2019/1158) and *Council Directive 1999/70/EC of 28 June 1999 concerning the framework agreement on fixed-term work concluded by ETUC, UNICE and CEEP* (Directive 1999/70/EC), with important gender implications as it aims at establishing a general framework for the elimination of discrimination against part-time workers (a group with female over-representation).

means importing policies from other countries.⁸ Nevertheless, in the end, the existence of convergence in this dimension or in any other index is an empirical issue.

3 Data and Methods

3.1 Data

Our source of information on working conditions is the European Working Conditions Survey (EWCS), carried out on a five-year basis by the European Foundation for the Improvement of Living Conditions (Eurofound, 2018). We specifically use the last three waves of this survey, corresponding to 2005, 2010 and 2015. We exclude the first three waves because they do not contain data on education. The sample sizes and the number of variables in each wave increase over time, with a minimum of 1000 workers interviewed in each country (500 in Malta, Luxembourg and Estonia). Our database covers the EU and, sporadically, other countries such as Switzerland, Norway and Turkey. We focus here on EU-27 countries plus the UK, restricting our analysis to home country nationals, which yields a total sample size of 66,030 workers.⁹ We use 50 variables on six dimensions (physical environment, work intensity, working time quality, social environment, skills and discretion and prospects) to construct several composite indicators of job quality according to the state-of-the-art on this topic. We outline the process of constructing these measures in the next subsection. Furthermore, we also use data on earnings from EWCS 2015, which is the only wave that codes this variable with sufficient accuracy (in previous waves, their availability is limited mainly to intervals or deciles).

3.2 Methods

In order to measure the quality of working conditions and reduce the dimensionality of the problem to manageable levels, we rely on the set of indicators developed by Eurofound and its collaborators (see, e.g., Eurofound, 2012, 2015, 2019; Fernández-Macías et al., 2015b; Green et al., 2013; Muñoz de Bustillo et al., 2011a, b) based on the EWCS.¹⁰ The quality and number of the variables available in the EWCS significantly increases over time, so we have adapted our selection of variables to the items available during the period 2005–2015.

⁸ Another perspective on convergence, also borrowed from the Economics of Growth, involves assessing the dispersion in gender gaps (i.e., the notion of σ -convergence, which researchers may explore using a dispersion statistic). We provide evidence on this type of convergence for the interested reader in the supplementary online material.

⁹ The inclusion of non-national employees would pose an additional problem, given that we cannot control for length of residence in the host country, which has an impact on migrants' job quality (see, e.g., Fernández-Macías et al. (2015a), and Simón et al. (2014)) and for which the survey does not provide any data. Table S1 in the supplementary online annex shows the size of the samples effectively used in the analysis.

¹⁰ Muñoz de Bustillo et al. (2011a) and Muñoz de Bustillo et al. (2011b) discuss in detail the different dimensions of job quality according to the available literature on Social and Medical Sciences. Muñoz de Bustillo et al. (2011a) provide an exhaustive description of the process of constructing the index and Eurofound (2019) present a good summary of the methodological issues. There are many examples of recent research on job quality that has used this indicator or a slightly modified version thereof (Antón et al., 2014; Antón et al., in Press; Eurofound, 2012, 2015, 2019; Fernández-Macías et al., 2015b; Grande et al., 2020; Menon et al., 2020).

According to the literature, and performing the necessary adjustments, we have organised the 50 available variables into 15 sub-dimensions of the six dimensions mentioned above (see Table 1).¹¹

Although the interested reader can find details on all the methodological issues related to the operationalisation of the indicator of job quality in the literature, we provide a summary description of this process. We use the raw variables (i.e., the questions available in the survey) to define all the dimensions of job quality, whereby a higher value of the indicator means a better job, transforming all the items using a min–max normalisation between 0 and 100.¹² Each subdimension provides an average score of its component variables and, in turn, each dimension is the result of the arithmetic mean of the scores of the sub-dimensions.¹³

In order to measure the average magnitude of the gender gap during the period 2005–2015, given that our interest does not lie in the detailed decomposition of the unexplained difference between males and females, we follow the suggestion of Elder et al. (2010) and estimate a single equation in the following fashion:¹⁴

$$Y_i = \beta_0 + \beta_1 \text{female}_i + \beta_2 D_i^{2010} + \beta_3 D_i^{2015} + X_i' \theta + \varepsilon_i \quad (1)$$

Y_i denotes the outcome of interest (the score in a certain job quality dimension, in natural logarithms) of individual i , female_i is a dummy variable that takes the value 1 for women and 0 for males; D^{2010}_i and D^{2015}_i are dummies for the years 2010 and 2015, respectively; X_i is a vector of control variables that, depending on the model, may include demographic and occupational characteristics and ε_i is a disturbance. Equipped with this equation, we estimate the gender gap in all six dimensions, pooling the three EWCS databases. The coefficient of interest is β_1 , which captures the magnitude of the gender gap in percentage points, in a certain dimension that the observational characteristics included in the covariates do not explain. A positive coefficient indicates that women perform better than men in this dimension, and vice versa. We first estimate this equation for the 28 countries in our sample as a whole, including country fixed effects, and then we determine the size of the gap across Europe for each country separately. The control variables in the equation first include demographic characteristics such as age, squared age and education (recoded into three levels: low, medium and high), and secondly, occupational characteristics (tenure, four occupational groups [three dummies], seven sectors of activities [six dummies] and a binary variable capturing whether the employee works in the private or public sector). We do not aim to introduce a long list of occupational characteristics—i.e., attempting to fully account for sex segregation—for two reasons: firstly, the size of the national samples is limited, particularly in certain countries; secondly, part of the differences might

¹¹ The supplementary online material (Table S2) provides a detailed list of the variables the index considers and their descriptive statistics (Table S2). We do not consider involuntary part-time work for two reasons. First of all, this information is only available from the 2010 wave onwards. Secondly, this issue is shaped by many factors external to the quality of a specific job (e.g., personal circumstances or the availability of retirement plans or childcare services).

¹² For instance, if a variable runs from 1 (best value) to 5 (worst value), we compute $100 \cdot (5 - \text{value of the variable}) / (5 - 1)$.

¹³ As in most of the recent research using these sorts of indexes (see, e.g., Eurostat, 2019), each variable receives the same weight within each sub-dimension and we assign the same importance to each sub-dimension when computing the score for each dimension. Sensitivity analyses in Muñoz de Bustillo et al. (2011a) suggest that these composite measures are fairly robust to the use of different weighting schemes because there is a high positive correlation between the outcomes in different dimensions.

¹⁴ For a review of the methods for breaking down wage differentials, see, for instance, Fortin et al. (2011).

Table 1 Dimensions, subdimensions and variables of working conditions. *Source:* Authors' elaboration from Eurofound (2012, 2015, 2019), Fernández-Macías et al. (2015b) and Muñoz de Bustillo et al. (2011a)

Dimension	Subdimension	Variable
D.1. Physical environment	D.1.1. Ambient risks	Vibrations
		Noise
		High temperatures
		Low temperatures
	D.1.2. Biological and chemical risks	Fumes
		Vapours
		Chemicals
		Tobacco
		Infectious materials
D.1.3. Posture-related risks	Tiring positions	
	Heavy loads	
	Moving people	
	Repetitive movements	
D.2. Work intensity	D.2.1. Quantitative demands	Pace of work (high speed)
		Pace of work (tight deadlines)
		Time pressure
		Disruptive interruptions
	D.2.2. Pace determinants and interdependency	Colleagues
		Customer demands
		Production targets
D.3. Working time quality	D.3.1. Duration	Machine speed
		Boss
	D.3.2. Atypical timetable	Working hours (≥ 10 and ≤ 48 per week)
		Long working days (≥ 10 per month)
		Night work
	D.3.3. Timetable arrangements	Saturday work
		Sunday work
		Shift work
		Setting of timetable arrangements (company versus worker)
	D.3.4. Work-life balance	Reconciliating family and social life
D.4. Social environment	D.4.1. Adverse social behaviour	Physical violence
		Bullying and mobbing
	D.4.2. Social support	Peer support
		Manager's help and support

Table 1 (continued)

Dimension	Subdimension	Variable
D.5. Skills and discretion	D.5.1. Cognitive dimension	Solving unforeseen problems
		Carrying out complex tasks
		Working with computers, smartphones, etc
		Ability to provide input
	D.5.2. Decision latitude	Control the order of tasks
		Control the speed of work
		Control the methods of work
		Control the timing of breaks
		Choice of working partners
	D.5.3. Training	Training provided by employer
On-the-job training		
Learning opportunities		
D.6. Prospects	D.6.1. Employment status	Type of contract
	D.6.2. Career prospects	Good promotion perspectives
	D.6.3. Job security	Job security prospects

be driven by potentially endogenous occupational characteristics (e.g., one of the main reasons for wage penalties for women is occupational segregation).¹⁵

In order to determine how the gap has changed over time, we augment Eq. 1 with interactions between the dummy variable and the time fixed effects:

$$Y_i = \beta_0 + \beta_1 \text{female}_i + \beta_2 D_i^{2010} + \beta_3 D_i^{2015} + \beta_4 \text{female}_i D_i^{2010} + \beta_5 \text{female}_i D_i^{2015} + X_i' \theta + \varepsilon_i \quad (2)$$

This equation allows us to recover not only the change in the gender gap from 2005 to 2015 (β_5), but also the changes in male (β_2) and female ($\beta_2 + \beta_5$) outcomes and the gaps in 2005 (β_1), 2010 ($\beta_1 + \beta_4$) and 2015 ($\beta_1 + \beta_5$). As with the magnitude of the gap, we estimate this equation for the EU as a whole (including country dummies) and each country separately. The sample's main descriptive statistics are presented in Table 5 in the Annex.

After estimating the gender gaps, we proceed to analyse the existence of β -convergence, which in this context refers to the extent to which the change in the gap over a certain period of time is negatively related to its initial level. Two different approaches can be used to quantify the differences in the gaps across countries: the first one involves considering that the differences in favour of women are positive, while those against are negative. An alternative perspective—hereafter, referred to as a modified gap—states that what matters is the absence of differences between men and women. A modified gap is calculated as the absolute value of the gap obtained in Eq. 2. We can test the existence of β -convergence

¹⁵ Interestingly, according to Petč and Reizer (2021), two thirds of the differences between males and females in the skills' required by their jobs remain after controlling for occupation and sector of activity.

through the following framework (Barro & Sala-i-Martin, 1992), regressing the gap's average variation rate for country c over the period between t_1 and t_2 compared to the initial level of the gap:

$$\frac{\text{gap}_{ct2} - \text{gap}_{ct1}}{\text{gap}_{ct1}} = \alpha + \beta \text{gap}_{ct1} + u_{ct1} \quad (3)$$

Within this framework, $\beta < 0$ indicates the existence of convergence. In order to maximise the statistical power of our analysis, we pool five-year changes.

We carry out the analyses using Stata 17. All the code is available from the authors upon request.

4 Results

4.1 Gender Gaps in Working Conditions in the EU

Table 2 presents the estimated gaps (i.e., the β_1 in Eq. 1) in the six dimensions of working conditions mentioned above for the period 2005–2015 for the EU, using three different models. The first one corresponds to the raw or unadjusted gender gap, as it does not contain any controls apart from country and time fixed effects. Model 2 presents an initial version of the adjusted gap considering the following control variables: age, squared age, education and tenure. Lastly, Model 3 extends the controls in Model 2 to include workers' occupational characteristics: occupation, sector of activity and a dummy for public sector employees. Two conclusions stand out quite clearly from the results. Firstly, women have better working conditions than men in the dimensions of physical environment, work intensity and working time quality, while the conditions for men are better in the subdimensions of prospects and, much more so, in skills and discretion. The differences in social environment are marginal. Secondly, the introduction of demographic and occupational controls, especially the latter, has a markedly differential effect on gender gaps in working conditions by dimension. While these controls reduce the gender gap significantly in physical environment and work intensity (71% and 60%, respectively), their effect is quite the opposite in skills and discretion and prospects, especially in the former case, where the gap jumps from 2 to 9%. This implies that differences in occupational characteristics play a major role in explaining the gender gap across different dimensions. In the first case, namely, physical environment and working time quality, the raw (unconditional) wage gap underestimates the extent of the advantage for women, whereas in prospects and skills and discretion, the raw gaps provide a rosier picture of the gender gap than it actually is.

For comparison purposes (as there is only one year with good-quality data, and they refer to net earnings), the adjusted gender wage gap for 2015 (Table 6) is 11.6%, higher than the estimations for the six dimensions of working conditions analysed above. On the whole, we may affirm that women face a negative gap in skill and discretion (−9%), prospects (−6%) and wages, while benefitting from a positive gap in working time quality (9%), work intensity (3%) and physical environment (3%), with similar conditions to men regarding social environment. This evidence is not at odds with the empirical evidence presented by scholars such as Goldin (2014, 2015), who highlights how women tend to work under more flexible schedules than men because their work activity is far from being limited to their professional career. This might have implications not only for earnings but also for future prospects. It is interesting to note that the gaps in gender conditions used

Table 2 Gender gap in different dimensions of working conditions (EU countries, 2005–2015). *Source:* Authors' analysis from EWCS

	(I) Physical environment	(II) Work intensity	(III) Working time quality	(IV) Social environment	(V) Skills and discretion	(VI) Prospects
Panel A. Model 1	0.090*** (0.003)	0.077*** (0.005)	0.080*** (0.004)	-0.003 (0.003)	-0.020*** (0.007)	-0.042*** (0.006)
R ²	0.061	0.028	0.047	0.041	0.046	0.033
Panel B. Model 2	0.084*** (0.003)	0.078*** (0.005)	0.079*** (0.004)	-0.003 (0.003)	-0.041*** (0.007)	-0.051*** (0.006)
R ²	0.123	0.035	0.055	0.045	0.151	0.076
Panel C. Model 3	0.026*** (0.003)	0.031*** (0.006)	0.088*** (0.004)	0.002 (0.003)	-0.088*** (0.007)	-0.056*** (0.006)
R ²	0.242	0.068	0.065	0.056	0.238	0.130
No. of observations	66,030	66,030	66,030	66,030	66,030	66,030

The table shows the estimated coefficient of a binary variable for females from a regression of the log of the score of the dimension on that binary variable, time and country dummies and demographic controls (age, squared age and education) in Model 2 and occupational characteristics (tenure, occupation, sector of activity and a dummy for public sector employees) in Model 3. Heteroscedasticity-robust standard errors between brackets

***significant at 1% level

**significant at 5% level

*significant at 10% level

to be comparatively smaller than those in earnings, in line with the evidence presented by Green et al. (2013), Maestas et al. (2018) and Muñoz de Bustillo et al. (2011a), who report substantially lower levels of inequality in job amenities than in the dispersion of labour income. Although it is beyond the scope of this paper, we speculate that, as mentioned above in the discussion on convergence, regulations play a more extensive role than in the case of earnings (e.g., there are basically no binding pay-related EU regulations) and the possible saturation of a non-monetary dimension (e.g., there is no maximum wage). It is, nonetheless, easy to construe that one may achieve the highest level of satisfaction in terms of another non-monetary attribute (e.g., the absence of certain types of risks), which could help to explain these patterns. Furthermore, information on colleagues' wages is often less public than that affecting working conditions, which may hinder the assessment of the gap.

Unsurprisingly, these results for gender gaps in working conditions in the EU reflect very different situations across countries. This is consistent with previous findings on specific dimensions, such as job-related training (Boll & Bublitz, 2018). As a sample of the behaviour of gender gaps in working conditions across EU-28, and without being overly complicated due to the large number of countries and variables considered in the analysis (28 × 6 estimates), Fig. 1 presents the adjusted gender gaps (controlling for demographic and occupational characteristics) for the six dimensions of working conditions and for the five countries with the widest and narrowest gender gaps in each dimension. The results without controls and including only demographic characteristics are qualitatively the same and are available in the supplementary online material.

A glance at the results in Fig. 1 reveals different patterns between gender in terms of job quality according to the specific dimension of work quality studied. Firstly, the dimensions of Physical and Social environment—especially the latter—have very small gender gaps across all countries. Secondly, the dimensions of working time quality and skill and discretion are remarkably similar across countries, with the former recording a positive gap in all cases (i.e., better working time quality among women), with differences only in the intensity of the differential, ranging from almost zero in the case of Lithuania and Finland to highly positive gaps in the UK and Hungary. In contrast, in the latter case women enjoy lower working quality in the dimension of skill and discretion, albeit with different intensity, ranging from very small gaps in the case of the UK and Luxembourg to relatively large gaps in Portugal and Italy. Finally, the two remaining dimensions, work intensity and prospects, record differences in both the sign and intensity of the gender gap. Work intensity is a good example of this, with Finland and Slovenia, for example, recording comparatively large negative gender gaps, while others, such as Spain and Portugal, have comparatively large positive gender-related differentials. Regarding prospects, the top countries, such as UK and Cyprus, have no gender differences, while at the other end of the spectrum, Greece and Italy present sizeable negative gaps.

Delving into the explanatory factors of the cross-country differences in the intensity of gender gaps is beyond the scope of this paper and calls for a separate investigation. Nevertheless, we may speculate about those elements that might play a significant role. In particular, country-specific institutional indices—mainly those setting minimum standards for working conditions—could shape the gender differentials in the same way as they do in the case of the pay gap (Bando, 2019; Bargain et al., 2019; Kahn, 2015; Schäfer & Gottschall, 2015). Furthermore, empirical evidence suggests that, even after controlling for sector of activity and occupation, there are important gender differences in job content (Bächmann et al., 2021; Pető & Reizer, 2021) and preferences over job attributes not only differ widely by sex but might also have a significant cultural and national content (Barbulescu & Bidwell, 2013; Browne, 1997; Burbano et al., 2020; Chou & Ngo, 2002; Lordan & Pischke, 2022).

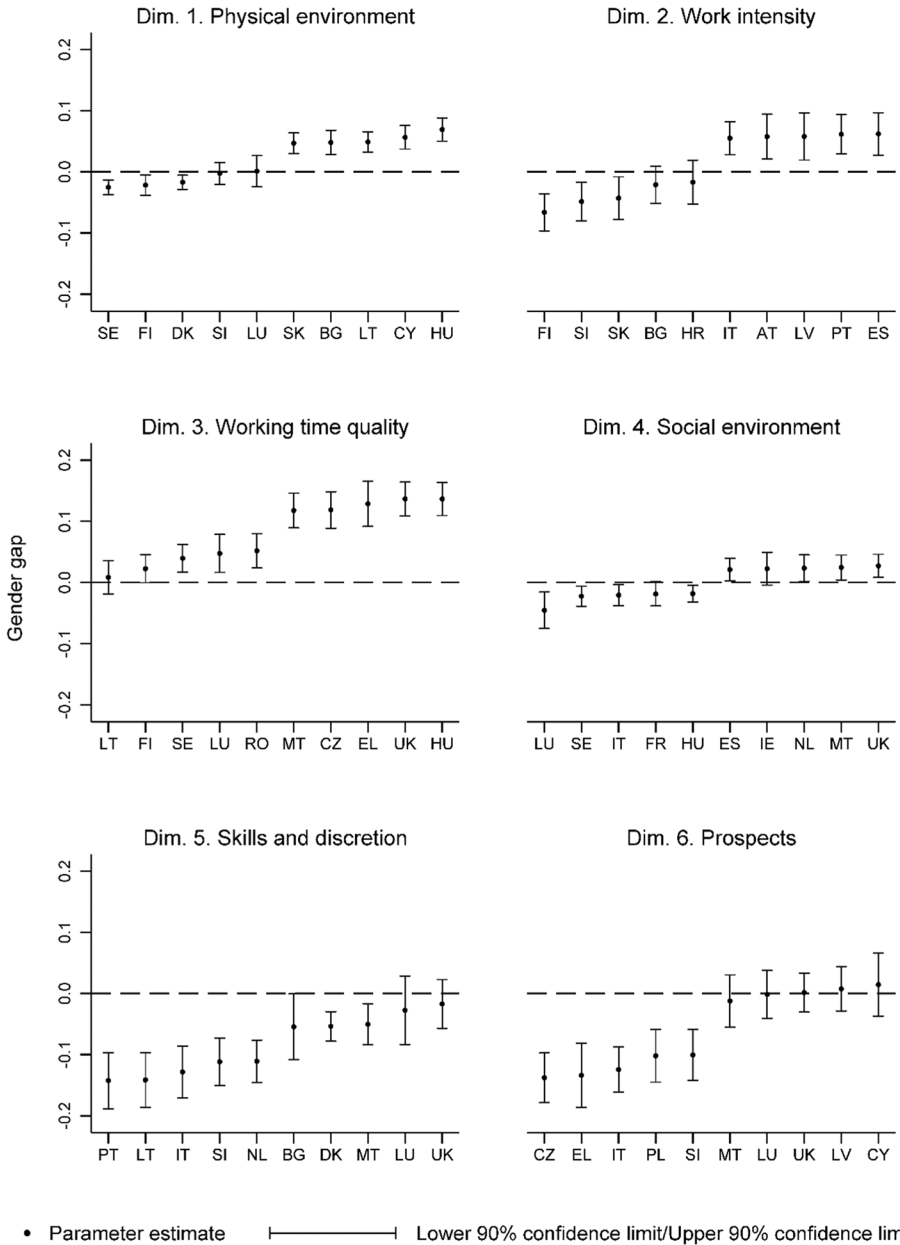


Fig. 1 Gender gaps in working conditions by country and dimension with demographic and occupational controls (top five and bottom five countries in each case, 2005–2015). *Note:* The graph shows the estimated coefficient of a binary variable for females from a country-specific regression of the log of the score of the dimension on that binary variable, demographic and occupational characteristics and time dummies. Confidence intervals computed from heteroskedasticity-robust standard errors between brackets. Observations are weighted according to country population. *Source:* Authors’ analysis from EWCS

4.2 The Evolution of Gender Gaps in the EU from 2005 to 2015

The second question we address involves changes in gender gaps in working conditions during the period 2005–2015 (the focus of Eq. 2). In other words, we aim to discover whether the EU is going through a “gender normalisation” of the labour market, understood in terms of a reduction in the differences in working conditions between sexes, or whether, by contrast, these gaps have remained unchanged or widened over the period. At the same time, the evolution of the gender gap in the different dimensions of working conditions (Table 3) highlights the role played by these changes in each group. As above, we report the changes in the raw or unadjusted gender gaps and in the adjusted gaps after controlling for demographic variables (Model 2) and demographic and occupational variables (Model 3).

The overall picture revealed by this chart reflects a certain stability in gender gaps during the period in question, although this general picture of stability reveals a more nuanced dynamic. Firstly, there is a statistically significant reduction in the physical environment gender gap, driven by the smaller, yet statistically significant, deterioration of this dimension among women within a context of stability. Thus, we could refer to “regressive” convergence in gender working conditions in this area, driven by the deterioration of job quality for the gender enjoying a better physical working environment. Secondly, something similar occurs regarding working time quality, with a reduction in the gender gap of nearly 3% during the period due to the deterioration of conditions among women. A potential driver of these results could be the reduction in occupational segregation over and above the detail captured by our covariates.¹⁶ The destruction of male-dominated jobs with particularly poor working conditions by phenomena such as globalisation and automation, or the occupation of jobs in these areas once held by home country nationals by migrant workers might have played a role here. Thirdly, there do not seem to be any statistically significant changes in the working intensity gender gap, although women record a small deterioration. Fourthly, the remaining dimensions of working conditions, namely, social environment, skills and discretion and prospects, do not record any statistically significant change in the corresponding gender gaps. In all cases, the consistency of the gaps is explained by the improvement in working conditions for both men and women, leaving the estimated differentials unchanged.

Observations are weighted according to country population. This stability of gender gaps in working conditions when looking at the EU as a whole might be due to countervailing movements at national level. In order to test whether this is the case, we study the countrywide evolution of gender gaps in the six dimensions of working conditions. Accordingly, Fig. 2 shows the change in the adjusted gender gaps across the EU (after controlling for demographic variables, occupation and industry). To facilitate the visualisation of the results, and as above, we show only the five countries at both ends of the scale of change in the gender gap. The most salient finding is that the relative stability at EU level is not necessarily replicated at national level. There are significant differences in the trend between countries not only in terms of the size of the change, but also in its direction. For example, and in terms of adjusted gaps, while the dimension of skills and discretion records a reduction in Austria and Greece, the opposite occurs in Italy and Portugal. Similar dynamics are

¹⁶ For instance, women are over-represented in social residential and non-residential care activities, a sector that has experienced steep relative—and often absolute—growth over the past 20 years and where there seems to be an ample margin for improving working conditions (Schulz, 2013).

Table 3 The evolution of the gender gap in working conditions by dimension (EU countries, 2005–2015). *Source:* Authors' analysis from EWCS

	(I) Physical environment	(II) Work intensity	(III) Working time quality	(IV) Social environment	(V) Skills and discretion	(VI) Prospects
<i>Panel A. Model 1</i>						
Change for males	0.021*** (0.006)	0.011 (0.010)	0.013* (0.007)	0.014*** (0.006)	0.094*** (0.012)	0.073*** (0.010)
Change for females	-0.015** (0.004)	-0.005 (0.009)	-0.008 (0.006)	0.022** (0.006)	0.121*** (0.013)	0.072*** (0.010)
Change in the gap	0.006 (0.007)	-0.016 (0.013)	-0.022** (0.009)	0.007 (0.008)	0.027 (0.018)	-0.001 (0.014)
<i>Panel B. Model 2</i>						
Change for males	0.011** (0.006)	0.002 (0.010)	0.005 (0.007)	0.014** (0.006)	0.070*** (0.011)	0.055*** (0.009)
Change for females	-0.006* (0.004)	-0.015* (0.009)	-0.018*** (0.006)	0.022*** (0.006)	0.092*** (0.012)	0.052*** (0.010)
Change in the gap	-0.017*** (0.007)	-0.017 (0.013)	-0.023** (0.009)	0.007 (0.008)	0.022 (0.017)	-0.004 (0.014)
<i>Panel C. Model 3</i>						
Change for males	0.005 (0.005)	-0.004 (0.010)	0.011 (0.007)	0.016*** (0.005)	0.083*** (0.011)	0.068*** (0.009)
Change for females	-0.014*** (0.004)	-0.018** (0.009)	-0.015*** (0.006)	0.021*** (0.006)	0.089*** (0.011)	0.055*** (0.010)
Change in the gap	-0.019*** (0.006)	-0.014 (0.013)	-0.026*** (0.009)	0.005 (0.008)	0.006 (0.016)	-0.014 (0.013)

The results are derived from a regression of the log of the score of the dimension on a dummy for females, a dummy for 2015, an interaction between the gender dummy and the year dummy, country dummies and the demographic controls in Model 2 and occupational characteristics in Model 3. The change for males is the coefficient of the year dummy; the change for females is the addition of the coefficient of the year dummy and the coefficient of the interaction and the change in the gap is the coefficient of the interaction. Heteroscedasticity-robust standard errors between brackets

***Significant at 1% level
 **Significant at 5% level
 *Significant at 10% level

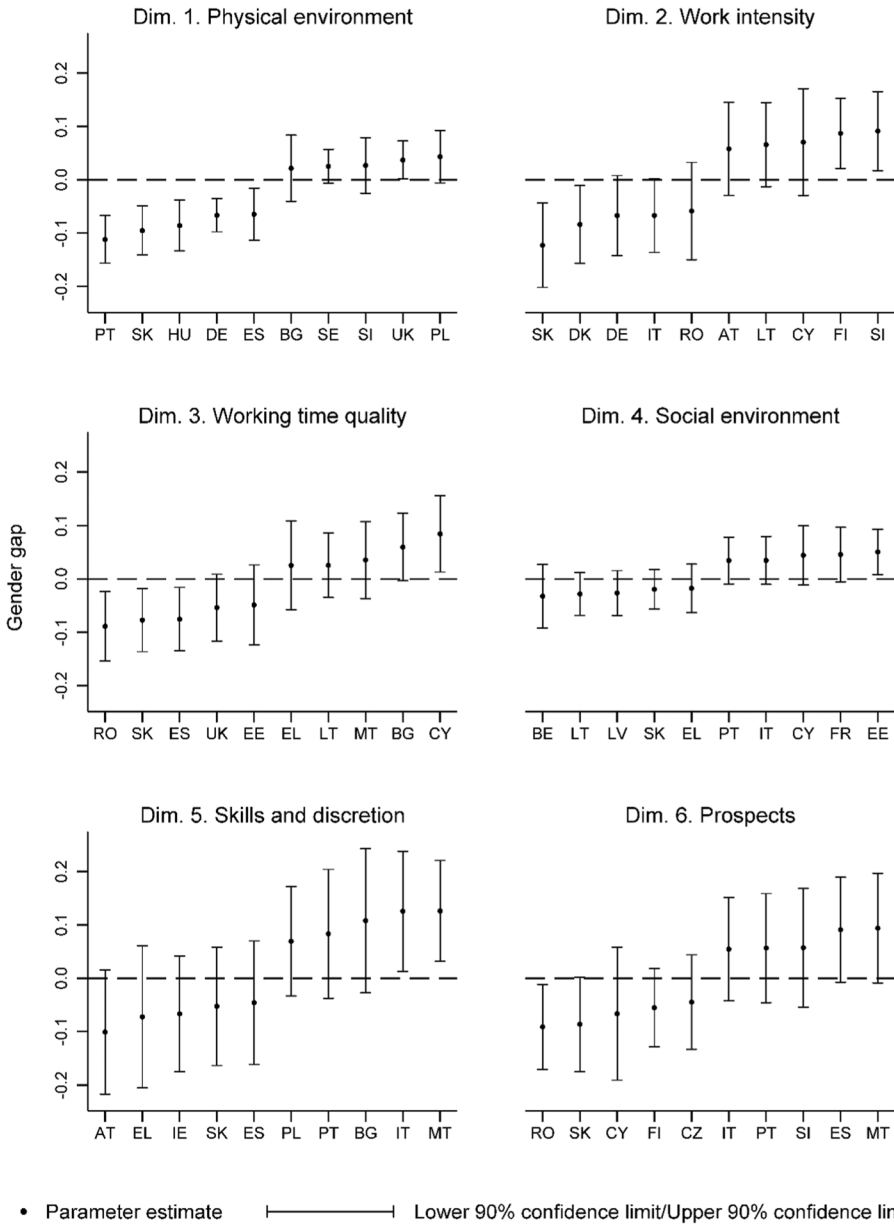


Fig. 2 The evolution of gender gaps in working conditions by country and dimension without controls (top five and bottom five countries according to the change in the gender gap, 2005–2015). *Note:* The graph shows the estimated coefficient of the interaction between a binary variable for females and a dummy for 2015 from a country-specific regression of the log of the score of the dimension on that sex dummy, time fixed effects and the interaction between the female dummy and year dummies. Confidence intervals computed from heteroskedasticity-robust standard errors between brackets. Observations are weighted according to population. *Source:* Authors’ analysis from EWCS

found in other areas of working conditions (e.g., Portugal and the UK in the dimension of physical environment, with a reduction of the gender gap in the former and increase in the latter), or work intensity (e.g., Slovakia and Denmark vs. Bulgaria). The results for this evolution of the differentials under Model 1 (unadjusted gaps) and Model 2 (controlling only for demographic characteristics) are qualitatively the same as the ones reported here, so we confine them to the supplementary online material.

4.3 Convergence in Gender Gaps Across the EU

The differences found in the previous section in the evolution of gender gaps in working conditions among EU-28 countries raise the question of whether they are leading to convergence, or, alternatively, whether we are moving towards a more diverse and disperse scenario. In order to answer this question, we assess the existence of β -convergence, using the gender gaps computed by the three different econometric models and adopting both the conventional and alternative definition of the gender gap. The plot of the change in the gap against its initial level suggests a clearly negative relationship that points to the existence of convergence (see Figs. 3 and 4, respectively, for results with controls, and the graphs in the supplementary material for similar results without control variables and only including demographic characteristics). The results of the econometric analysis (Table 4) formally confirm the existence of convergence in all six areas of job quality and according to the two definitions of the gender gap. The only difference among the different dimensions is the intensity of the relationship (the speed of convergence): higher in the dimensions of work intensity, skills and discretion, and social and physical environment and lower in prospects or working time quality (focusing on the results with controls).

5 Conclusions

The increasing and sustained interest in gender issues among both academia and the public at large has led to a significant body of literature on the earnings differentials between males and females. Nevertheless, the evidence on how men and women perform differently in terms of non-monetary working conditions is much more limited. This is important not only because workers are able to trade wages for better job amenities, but also because markets do not always reward non-monetary working conditions according to workers' preferences. In this article, we have used the EWCS 2005–2015 to study the magnitude of the gender gap in six different dimensions of job quality, covering most, if not all, of the attributes considered important by the literature. For the EU as a whole, on the one hand, we have found that women enjoy better working conditions in terms of physical environment, work intensity and working time quality. This is in line with the types of jobs held by female workers and with the fact that women tend to prioritise (whether by choice or by virtue of necessity) work schedules that allow them to reconcile their professional careers with other activities (e.g., care work). On the other hand, women generally face disadvantages in the dimensions of skills and discretion and prospects, which is not at odds with the previous findings: more working time quality and less work intensity may be a disadvantage for developing their

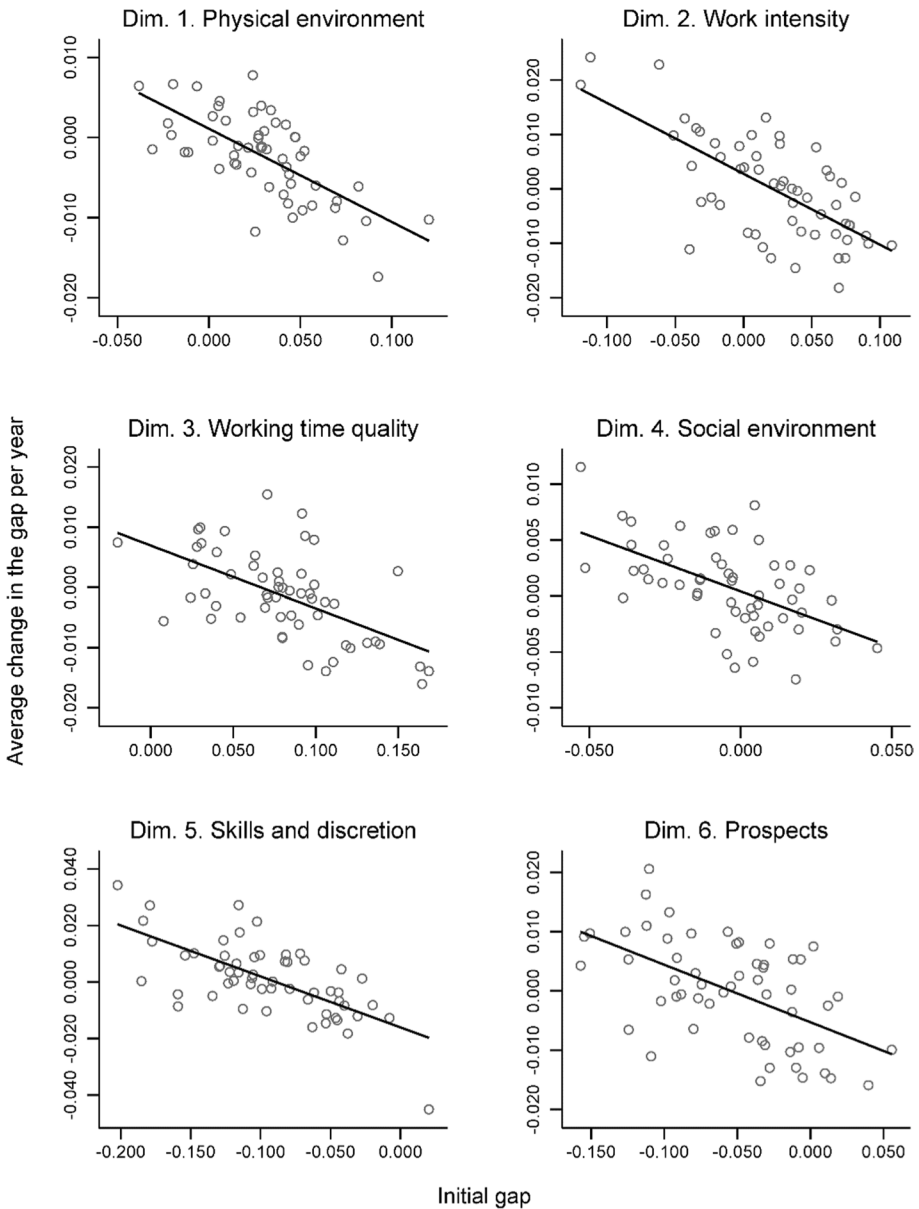


Fig. 3 β -convergence in the gender gap (with demographic and occupational controls) in working conditions (EU countries, 2005–2015). *Note:* Each graph plots the average change in the gap per year using five-year periods (2005–2010 and 2010–2015) against the initial value of the gap in each period. *Source:* Authors' analysis from EWCS

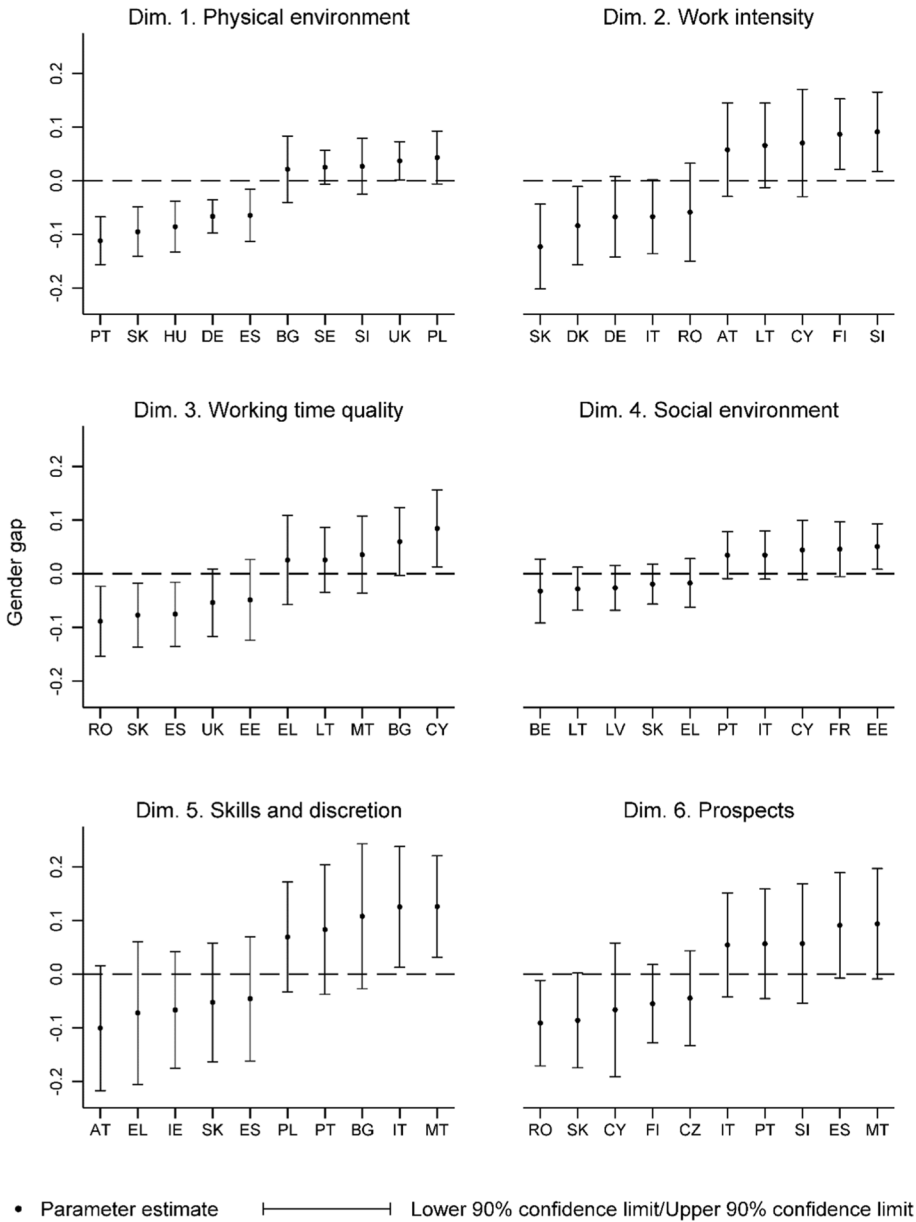


Fig. 4 β -convergence in the modified gender gap (with demographic and occupational controls) in working conditions (EU countries, 2005–2015). *Note:* Each graph plots the average change in the gap per year using five-year periods (2005–2010 and 2010–2015) against the initial value in each period. *Source:* Authors' analysis from EWCS

Table 4 β -convergence in the gender gap in working conditions by dimension (EU countries, 2005–2015). *Source:* Authors' analysis from EWCS

	(I) Physical environment	(II) Work intensity	(III) Working time quality	(IV) Social environment	(V) Skills and discretion	(VI) Prospects
<i>Panel A. Conventional gap</i>						
Model 1	-0.067*** (0.011)	-0.110*** (0.016)	-0.098*** (0.018)	-0.128*** (0.022)	-0.199*** (0.046)	-0.084*** (0.018)
Model 2	-0.068*** (0.013)	-0.110*** (0.017)	-0.087*** (0.020)	-0.130*** (0.023)	-0.162*** (0.028)	-0.088*** (0.019)
Model 3	-0.114*** (0.018)	-0.130*** (0.018)	-0.097*** (0.019)	-0.096*** (0.021)	-0.181*** (0.033)	-0.097*** (0.020)
<i>Panel B. Modified gap</i>						
Model 1	-0.067*** (0.011)	-0.097*** (0.017)	-0.098*** (0.018)	-0.181*** (0.025)	-0.169*** (0.038)	-0.102*** (0.022)
Model 2	-0.068*** (0.013)	-0.105*** (0.018)	-0.094*** (0.017)	-0.183*** (0.024)	-0.198*** (0.032)	-0.106*** (0.025)
Model 3	-0.156*** (0.020)	-0.191*** (0.015)	-0.104*** (0.018)	-0.168*** (0.029)	-0.171*** (0.028)	-0.104*** (0.025)
No. of observations	56	56	56	56	56	56

The table shows the coefficient of the initial gender gap from a regression of the average change per year in the gender gap on the initial level of the gender gap and a time dummy for the period 2010–2015. The gap in Model 1 controls solely for time fixed effects; Model 2 adds demographic endowments and Model 3 occupational characteristics. Standard errors clustered at country level between brackets

***Significant at 1% level

**Significant at 5% level

*Significant at 10% level

professional careers. These results are consistent with the research on specific job attributes mentioned in the brief literature review included in the introduction.¹⁷

Regarding the trend in the gender gap over time for the EU as a whole, it tends to decrease in those dimensions in which women outperform men. The reason for this may be that women are increasingly assuming jobs that are similar to those held by males, in line with the higher level of gender equality in terms of human capital among the younger cohorts and changes in culture and lifestyles (Inglehart & Norris, 2003). Nevertheless, despite the cohesion observed for the EU as a whole, there are differences in the evolution of the gap across countries, in line with the absence of deterministic patterns outlined by Gallie (2017) for overall job quality trends. We have therefore assessed whether there is a process of convergence of those differentials over time. Our results provide clear evidence for β -convergence, whereby the change in the gap is negatively correlated to its initial level. These findings are in keeping with universalist theories and previous findings on institutional convergence across the EU.

Policymakers should take note of this research for two reasons. Firstly, the gender gap is not limited to pay. There are significant differences by sex in other domains related to the job attributes workers value (Maestas et al., 2018; Nikolova & Cnossen, 2020). Focusing the public debate solely on earning differentials runs the risk of ignoring a relevant part of the elements that contribute to individuals' wellbeing. Secondly, it is important to note that these differences are not always unfavourable to women. The gender gap in terms of welfare might therefore be different if we were able to summarise the differences in job attributes by sex.¹⁸

Besides seeking to explore the aggregate gender gap due to the whole range of working conditions pursuant to Maestas et al. (2018), there are several issues that we have left for further research. The first one involves developing a formal theoretical framework for analysing the convergence in gender gaps and sex differences in non-monetary working conditions. A second path for future work is to explore the determinants of differences in gender gaps across countries and over time. Specifically, we believe that the role of labour market institutions deserves considerable attention. Addressing the latter topic is far from straightforward, as there are only a limited number of countries for which detailed data are available (as in the EWCS), which weakens the statistical power of potential econometric analyses. Nonetheless, our results provide comparable estimates of the gaps for a set of countries, which might feed this sort of aggregate quantitative exercise.

Appendix 1

See Tables 5 and 6.

¹⁷ For example, the findings reported by Boll and Bublitz (2018) regarding training, Addabbo and Favaro (2011) and the ILO (2017) regarding non-standard employment and Campos-Serna et al. (2013) regarding job insecurity and contractual working conditions are in line with the gender gap (the dimensions that include these attributes in our analysis of job quality) found for most EU countries in these pages.

¹⁸ Maestas et al. (2018) conduct an experimental survey for the US that allows them to estimate the monetary value of every job attribute for each worker and calculate an "adjusted" earnings distribution that includes the valuation of non-monetary amenities. In the US case, the gender gap when considering this element narrows. Unfortunately, we cannot implement their approach here, as neither the EWCS nor any other database contains that sort of instrument.

Table 5 Descriptive statistics. *Source:* Authors' analysis from EWCS

	Means (standard deviations)		Differences [standard errors]
	Men	Women	
Dim. 1. Physical environment	79.444 (16.762)	85.779 (12.560)	- 6.336*** [0.188]
Dim. 2. Work intensity	59.416 (20.316)	63.398 (19.697)	- 3.982*** [0.257]
Dim. 3. Working time quality	64.372 (16.722)	69.480 (14.997)	- 5.108*** [0.201]
Dim. 4. Social environment	83.471 (15.021)	83.515 (15.520)	- 0.044 [0.199]
Dim. 5. Skills and discretion	56.673 (22.340)	56.398 (22.025)	0.275 [0.282]
Dim. 6. Prospects	67.150 (21.575)	66.022 (22.002)	1.128*** [0.274]
Age	39.810 (11.694)	39.962 (11.440)	1.145*** [0.150]
Tenure	10.080 (9.576)	8.935 (8.642)	1.145 [0.116]
Low education level	0.224 (0.417)	0.181 (0.385)	0.043*** [0.005]
Medium education level	0.508 (0.500)	0.499 (0.500)	0.009 [0.006]
High education level	0.269 (0.443)	0.320 (0.467)	- 0.052*** [0.006]
Public sector	0.258 (0.437)	0.376 (0.484)	- 0.118*** [0.006]
High-skilled white collar	0.339 (0.473)	0.429 (0.495)	- 0.089*** [0.006]
Low-skilled white collar	0.189 (0.391)	0.391 (0.488)	0.202*** [0.006]
High-skilled blue collar	0.229 (0.420)	0.041 (0.198)	0.188*** [0.004]
Low-skilled blue collar	0.243 (0.429)	0.139 (0.346)	0.104*** [0.005]
Primary sector	0.038 (0.191)	0.018 (0.132)	0.020*** [0.002]
High-tech industry	0.083 (0.276)	0.030 (0.171)	0.053*** [0.003]
Low-tech industry	0.149 (0.356)	0.094 (0.291)	0.055*** [0.004]
Non-manufacturing industry	0.024 (0.154)	0.007 (0.083)	0.017*** [0.002]
Construction	0.109 (0.312)	0.017 (0.131)	0.092*** [0.003]
Knowledge-intensive services	0.253	0.480	- 0.227***

Table 5 (continued)

	Means (standard deviations)		Differences [standard errors]
	Men	Women	
Less knowledge-intensive services	(0.435) 0.343	(0.500) 0.354	[0.006] − 0.011*
No. of observations	(0.475) 34,358	(0.478) 37,964	[0.006]

***Significant at 1% level

**Significant at 5% level

*Significant at 10% level

Table 6 Gender wage gap (EU countries, 2015). *Source:* Authors' analysis from EWCS

	(I) Model 1	(II) Model 2	(III) Model 3
Gender pay gap	− 0.102*** (0.012)	− 0.124*** (0.011)	− 0.116*** (0.011)
R ²	0.271	0.377	0.409
Mean of dependent variable	2.147	2.147	2.147
Mean of independent variable	0.504	0.504	0.504
No. of observations	20,298	20,298	20,298

The table shows the estimated coefficient of a binary variable for females from a regression of the log of the score of the dimension on that binary variable, time and country dummies and the demographic controls in Model 2 (age, squared age and education) and additionally, occupational characteristics in Model 3 (tenure, occupation, sector of activity and a dummy for public sector employees). Heteroskedasticity-robust standard errors between brackets. Observations are weighted according to country population

***Significant at 1% level

**Significant at 5% level

*Significant at 10% level

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References

- Addabbo, T., & Favaro, D. (2011). Part-time and temporary employment: a gender perspective. In T. Addabbo & G. Solinas (Eds.), *Non-standard employment and quality of work the case of Italy* (pp. 53–70). Physica-Verlag. https://doi.org/10.1007/978-3-7908-2106-2_4
- Adler, M. A. (1993). Gender differences in job autonomy: The consequences of occupational segregation and authority position. *Sociological Quarterly*, 34(3), 449–465. <https://doi.org/10.1111/j.1533-8525.1993.tb00121.x>
- Altonji, J. G., & Blank, R. M. (1999). Race and gender in the labor market. In Orley C. Ashenfelter & D. Card (Eds.), *Handbook of Labor Economics* (vol. 3C, pp. 3143–3259). North Holland. [https://doi.org/10.1016/S1573-4463\(99\)30039-0](https://doi.org/10.1016/S1573-4463(99)30039-0)
- Angrist, J. D., & Pischke, J.-S. (2008). *Mostly harmless econometrics: An empiricist's companion*. Princeton University Press.
- Antón, J.-I., Fernández-Macías, E., & Winter-Ebmer, R. (in Press). Does robotization affect job quality? Evidence from European regional labour markets. *Industrial Relations: A Journal of Economy and Society*.
- Antón, J.-I., Muñoz de Bustillo, R., & Fernández-Macías, E. (2014). Supplementary private pensions and saving: Evidence from Spain. *Journal of Pension Economics and Finance*, 13(4), 367–388. <https://doi.org/10.1017/S1474747214000158>
- Arts, W. A., & Gelissen, J. (2010). Models of the Welfare State. In F. G. Castles, S. Leibfried, J. Lewis, H. Obinger, & C. Pierson (Eds.), *The Oxford Handbook of the Welfare State*. Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780199579396.003.0039>
- Bächmann, A.-C., Kleinert, C., & Leuze, K. (2021). Understanding the gender pay gap between and within occupations in Germany: What role do individual job tasks play? *SocArXiv*. <https://doi.org/10.31235/osf.io/5f4x9>
- Bando, R. (2019). Evidence-based gender equality policy and pay in latin America and the caribbean: Progress and challenges. *Latin American Research Review*, 28, 10. <https://doi.org/10.1186/s40503-019-0075-3>
- Barbulescu, R., & Bidwell, M. (2013). Do women choose different jobs from men? Mechanisms of application segregation in the market for managerial workers. *Organization Science*, 24(3), 737–756. <https://doi.org/10.1287/orsc.1120.0757>
- Bargain, O., Doorley, K., & Van Kerm, P. (2019). Minimum wages and the gender gap in pay: New evidence from the United Kingdom and Ireland. *Review of Income and Wealth*, 65(3), 514–539. <https://doi.org/10.1111/roiw.12384>
- Barro, R. J., & Sala-i-Martin, X. (1992). Convergence. *Journal of Political Economy*, 100(2), 223–251. <https://doi.org/10.1086/261816>
- Betrand, M. (2011). New perspectives on gender. In D. Card & O. Ashenfelter (Eds.), *Handbook of Labor Economics* (pp. 1543–1590). North Holland: Elsevier. [https://doi.org/10.1016/S0169-7218\(11\)02415-4](https://doi.org/10.1016/S0169-7218(11)02415-4)
- Birkelund, G. E., Lancee, B., Larsen, E. N., Polavieja, J. G., Radl, J., & Yemane, R. (2022). Gender discrimination in hiring: Evidence from a cross-national harmonized field experiment. *European Sociological Review*, 38(3), 337–354. <https://doi.org/10.1093/esr/jcab043>
- Blau, F. D., & Kahn, L. M. (2017). The gender wage gap: Extent, trends, and explanations. *Journal of Economic Literature*, 55(3), 789–865. <https://doi.org/10.1257/jel.20160995>
- Boll, C., & Bublitz, E. (2018). A cross-country comparison of gender differences in job-related training: The role of working hours and the household context. *British Journal of Industrial Relations*, 56(3), 503–555. <https://doi.org/10.1111/bjir.12299>
- Bonhomme, S., & Jolivet, G. (2009). The pervasive absence of compensating differentials. *Journal of Applied Econometrics*, 24(5), 763–795. <https://doi.org/10.1002/jae.1074>
- Booth, A., Fan, E., Meng, X., & Zhang, D. (2019). Gender differences in willingness to compete: The role of culture and institutions. *Economic Journal*, 129(618), 734–764. <https://doi.org/10.1111/econj.12583>

- Bouget, D. (2006). Convergence in social welfare systems: from evidence to explanations. *European Journal of Social Quality*, 6(1), 109–126. <https://doi.org/10.3167/146179106780246549>
- Browne, B. A. (1997). Gender and preferences for job attributes: A cross cultural comparison. *Sex Roles*, 37(1/2), 61–71. <https://doi.org/10.1023/A:1025688603525>
- Bryan, M. L., & Jenkins, S. P. (2016). Multilevel modelling of country effects: A cautionary tale. *European Sociological Review*, 32(1), 3–22. <https://doi.org/10.1093/esr/jcv059>
- Burbano, V., Padilla, N., & Meier, S. (2020). *Gender differences in preferences for meaning at work* (IZA Discussion Paper No. 13053). Institute of Labor Economics. Bonn. <https://docs.iza.org/dp13053.pdf>.
- Burgard, C., & Görlitz, K. (2014). Continuous training, job satisfaction and gender: An empirical analysis using German panel data. *Evidence-Based HRM*, 2(2), 126–144. <https://doi.org/10.1108/EBHRM-11-2012-0016>
- Caliendo, M., & Wittbrodt, L. (2022). Did the minimum wage reduce the gender wage gap in Germany? *Labour Economics*, 78, 102228. <https://doi.org/10.1016/j.labeco.2022.102228>
- Campos-Serna, J., Ronda-Pérez, E., Artazcoz, L., Moen, B. E., & Benavides, F. G. (2013). Gender inequalities in occupational health related to the unequal distribution of working and employment conditions: A systematic review. *International Journal for Equity in Health*, 12(1), 57. <https://doi.org/10.1186/1475-9276-12-57>
- Chow, I. H. S., & Ngo, H.-Y. (2011). Gender differences in job attribute preferences and job choice of university students in China. *Journal of Applied Business Research (JABR)*, 18(2), 15–25. <https://doi.org/10.19030/jabr.v18i2.2111>
- Chung, H., & Van der Lippe, T. (2018). Flexible working, work-life balance, and gender equality: Introduction. *Social Indicators Research*, 56(3), 1–17. <https://doi.org/10.1007/s11205-018-2025-x>
- Cifre, E., Vera, M., & Signani, F. (2015). Women and men at work: Analyzing occupational stress and well-being from a gender perspective. *Revista Puertorriqueña De Psicología*, 26(2), 172–191.
- Clark, A. (2015). What makes a good job? Job quality and job satisfaction. *IZA World of Labor*. <https://doi.org/10.15185/izawol.215>
- Clemens, J., Kahn, L. B., & Meer, J. (2018). *The minimum wage, fringe benefits, and worker welfare* (NBER Working Paper No. 24635). National Bureau of Economic Research, Cambridge, MA. <https://doi.org/10.3386/w24635>.
- European Commission. (2015). *Gender equality. Special Eurobarometer 428* (Report). European Commission, Brussels. https://ec.europa.eu/anti-trafficking/special-eurobarometer-428-gender-equality_en.
- European Commission. (2017). *Gender equality. Special Eurobarometer 465* (Report). European Commission, Brussels. <https://europa.eu/eurobarometer/api/deliverable/download/file?deliverableId=63613>.
- European Commission. (2018). *Equality 2018: Report on equality between women and men in the EU*. Publications Office of the European Union. <https://op.europa.eu/en/publication-detail/-/publication/950dce57-6222-11e8-ab9c-01aa75ed71a1/language-en>.
- Cortés, P., Pan, J., Pilossoph, L., & Zafar, B. (2021). *Gender differences in job search and the earnings gap: evidence from Business majors* (NBER Working Paper No. 28820). National Bureau of Economic Research, Cambridge, MA. <https://doi.org/10.3386/w28820>.
- Croson, R., & Gneezy, U. (2009). Gender differences in preferences. *Journal of Economic Literature*, 47(2), 448–474. <https://doi.org/10.1257/jel.47.2.448>
- Davies, R. B., & Vadlamannati, K. C. (2013). A race to the bottom in labor standards? An empirical investigation. *Journal of Development Economics*, 103(3), 620–634. <https://doi.org/10.1016/j.jdeveco.2013.01.003>
- Council Directive 1999/70/EC of 28 June (1999). concerning the framework agreement on fixed-term work concluded by ETUC, UNICE and CEEP. <http://data.europa.eu/eli/dir/1999/70/oj>.
- Directive (2003). 2003/88/EC of the European Parliament and of the Council of 4 November 2003 concerning certain aspects of the organisation of working time. <http://data.europa.eu/eli/dir/2003/88/oj>.
- Directive (EU) (2019). 2019/1158 of the European Parliament and of the Council of 20 June 2019 on work-life balance for parents and carers and repealing Council Directive 2010/18/EU. <http://data.europa.eu/eli/dir/2019/1158/oj>.
- Duanmu, J.-L. (2014). A race to lower standards? Labor standards and location choice of outward FDI from the BRIC countries. *International Business Review*, 23(3), 620–634. <https://doi.org/10.1016/j.ibusrev.2013.10.004>
- EASHW. (2003). *Gender issues in safety and health at work—a review*. Office for Official Publications of the European Communities. <https://osha.europa.eu/en/publications/reports/209>.
- Elder, T. E., Goddeeris, J. H., & Haider, S. J. (2010). Unexplained gaps and Oaxaca-Blinder decompositions. *Labour Economics*, 17(1), 284–290. <https://doi.org/10.1016/j.labeco.2009.11.002>

- Eurofound. (2018). *European Working Conditions Survey Integrated Data File, 1991–2015 (7th edition)* [Data set]. UK Data Service. London. <https://doi.org/10.5255/UKDA-SN-7363-7>.
- Eurofound. (2019). *Upward convergence in working conditions*. Publications Office of the European Union. <https://doi.org/10.1016/10.2806/090694>
- Eurofound. (2012). *Trends in job quality in Europe*. Publications Office of the European Union. https://www.eurofound.europa.eu/sites/default/files/ef_publication/field_ef_document/ef1228en_0.pdf.
- Eurofound. (2015). *Convergence and divergence of job quality in Europe 1995–2010*. Publications Office of the European Union. https://www.eurofound.europa.eu/sites/default/files/ef_publication/field_ef_document/ef1521en.pdf.
- Eurostat. (2019). *European Union Labour Force Survey Database (version November 2019)*. Eurostat: Luxembourg. <https://doi.org/10.2907/LFS1983-2018V.2>
- Fernández-Macías, E., Muñoz de Bustillo, R., & Antón, J.-I. (2015b). *Job quality in Europe in the first decade of the 21st century* (Working Paper No. 1059). Department of Economics, Johannes Kepler University Linz. <http://www.econ.jku.at/papers/2015b/wp1509.pdf>.
- Fernández-Macías, E., Grande, R., Del Rey, L. A., & Antón, J.-I. (2015a). Employment and occupational mobility among recently arrived immigrants: The Spanish case 1997–2007. *Population Research and Policy Review*, 34(2), 243–277. <https://doi.org/10.1007/s11113-014-9347-4>
- Fortin, N., Lemieux, T., & Firpo, S. (2011). Decomposition methods in Economics. In O. Ashenfelter & D. Card (Eds.), *Handbook of Labor Economics* (pp. 1–102). North Holland: Elsevier.
- Fuchs-Schündeln, N., & Schündeln, M. (2020). The long-term effects of communism in Eastern Europe. *Journal of Economic Perspectives*, 34(2), 172–191. <https://doi.org/10.1257/jep.34.2.172>
- Gahan, P., Mitchell, R., Coney, S., Steward, A., & Cooper, B. (2012). Economic globalization and convergence in labor market regulation: an empirical assessment. *American Journal of Comparative Law*, 60(3), 703–742. <https://doi.org/10.5131/AJCL.2011.0028>
- Gallie, D. (2007). Production regimes, employment regimes, and the quality of work. In D. Gallie (Ed.), *Employment regimes and the quality of work* (pp. 1–34). Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780199230105.003.0001>
- Gallie, D. (2017). The quality of work in a changing labour market. *Social Policy and Administration*, 51(2), 226–243. <https://doi.org/10.1111/spol.12285>
- Glass, J. (1990). The impact of occupational segregation on working conditions. *Social Forces*, 68(3), 779–796. <https://doi.org/10.1093/sf/68.3.779>
- Goldin, C. (2014). A grand gender convergence: Its last chapter. *American Economic Review*, 104(4), 1091–1119. <https://doi.org/10.1257/aer.104.4.1091>
- Goldin, C. (2015). How to achieve gender equality. *Milken Institute Review*, 3, 24–33.
- Goldin, C. (2021). *Career and family: Women's century long journey toward equity*. Princeton University Press.
- Grande, R., Muñoz de Bustillo, R., Fernández-Macías, E., & Antón, J.-I. (2020). Innovation and job quality. A firm-level exploration. *Structural Change and Economic Dynamics*, 54, 130–142. <https://doi.org/10.1016/j.strueco.2020.04.002>
- Green, F., Mostafa, T., Parent-Thirion, A., Vermeylen, G., Van Houten, G., Biletta, I., & Lyly-Yrjänäinen, M. (2013). Is job quality becoming more unequal? *Industrial and Labor Relations Review*, 66(4), 753–784.
- Grönlund, A. (2012). On-the-job training—a mechanism for segregation? Examining the relationship between gender, occupation, and on-the-job training investments. *European Sociological Review*, 28(3), 408–420. <https://doi.org/10.1093/esr/jcr007>
- Hefeker, C., & Neugart, M. (2010). Labor market regulation and the legal system. *International Review of Law and Economics*, 30(3), 218–225. <https://doi.org/10.1016/j.irl.2010.03.004>
- Hyland, M., Djankov, S., & Goldberg, P. K. (2020). Gendered laws and women in the workforce. *American Economic Review: Insights*, 2(4), 475–490. <https://doi.org/10.1257/aeri.20190542>
- Inglehart, R., & Norris, P. (2003). *Rising tide: Gender equality and cultural change around the world*. Cambridge University Press. <https://doi.org/10.1017/CBO9780511550362>
- International Labour Office. (2017). Women in non-standard employment. *INWORK Issue Brief*, 9. https://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---travail/documents/publication/wcms_556160.pdf.
- Jordá, V., & Sarabia, J. M. (2015). International convergence in well-being indicators. *Social Indicators Research*, 120(1), 1–27. <https://doi.org/10.1007/s11205-014-0588-8>
- Kahn, L. (2015). Wage compression and the gender pay gap. *IZA World of Labor*. <https://doi.org/10.15185/izawol.150>

- Kahn, M. E. (2016). Compensating differentials. In S. N. Durlauf & L. E. Blume (Eds.), *The New Palgrave Dictionary of Economics* (pp. 923–934). Palgrave Macmillan. https://doi.org/10.1057/978-1-349-95121-5_2182-1
- Kaufmann, D., Kraay, A., & Mastruzzi, M. (2011). The Worldwide Governance Indicators: Methodology and analytical issues. *Hague Journal on the Rule of Law*, 3(2), 220–246. <https://doi.org/10.1017/S1876404511200046>
- Kleven, H., Landais, C., Posch, J., Steinhauer, A., & Zweimüller, J. (2019). Child penalties across countries: Evidence and explanations. *AEA Papers and Proceedings*, 109, 122–126. <https://doi.org/10.1257/pandp.20191078>
- Knoke, D., & Ishio, Y. (1998). The gender gap in company job training. *Work and Occupations*, 25(2), 141–167. <https://doi.org/10.1177/2F0730888498025002002>
- Ledić, M., & Rubil, I. (2021). Beyond wage gap, towards job quality gap: The role of inter-group differences in wages, non-wage job dimensions, and preferences. *Social Indicators Research*. <https://doi.org/10.1007/s11205-021-02612-y>
- Lindley, J. (2015). Gender differences in job quality. In A. Felstead, D. Gallie, & F. Green (Eds.), *Unequal Britain at work* (pp. 42–61). Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780198712848.001.0001>
- Lippmann, Q., Georgieff, A., & Senik, C. (2020). Undoing gender with institutions: Lessons from the German division and reunification. *Economic Journal*, 130(629), 1445–1470. <https://doi.org/10.1093/ej/uez057>
- Lordan, G., & Pischke, J.-S. (2022). Does rosie like riveting? Male and female occupational choices. *Economica*, 89(353), 110–130. <https://doi.org/10.1111/ecca.12390>
- Maestas, N., Mullen, K. J., Powell, D., von Wachter, T., & Wenger, J. B. (2018). *The value of working conditions in the United States and implications for the structure of wages* (NBER Working Paper No. 25204). National Bureau of Economic Research, Cambridge, MA. <https://doi.org/10.3386/w25204>.
- Mandel, H., & Semyonov, M. (2006). A Welfare State paradox: State interventions and women's employment opportunities in 22 countries. *American Journal of Sociology*, 111(6), 1910–1949. <https://doi.org/10.1086/499912>
- Manning, A. (2003). *Monopsony in motion: Imperfect competition in labor markets*. Princeton University Press.
- Mayer-Foulkes, D. (2012). Divergences and convergences in human development. *Indian Journal of Development*, 6(2), 175–224. <https://doi.org/10.1177/2F0973703020120202>
- Mazumdar, K. (2002). A note on cross-country divergence in standard of living. *Applied Economics Letters*, 9(2), 87–90. <https://doi.org/10.1080/13504850110049388>
- Mehmet, O. (2006). Race to the bottom: the impact of globalization on labor markets—a review of empirical and theoretical evidence. In B. N. Ghosh & H. M. Guven (Eds.), *Globalization and the third world* (pp. 148–161). Palgrave Macmillan. https://doi.org/10.1057/9780230502567_9
- Menon, S., Salvatori, A., & Zwysen, W. (2020). The effect of computer use on work discretion and work intensity: Evidence from Europe. *British Journal of Industrial Relations*, 58(4), 1004–1038. <https://doi.org/10.1111/bjir.12504>
- Mühlau, P. (2011). Gender inequality and job quality in Europe. *Management Revue*, 22(2), 114–131. <https://doi.org/10.5771/0935-9915-2011-2-114>
- Muñoz de Bustillo, R., Fernández-Macías, E., Antón, J.-I., & Esteve, F. (2011a). Measuring more than money: The social economics of job quality. *Edward Elgar*. <https://doi.org/10.4337/9781849805919>
- Muñoz de Bustillo, R., Fernández-Macías, E., Esteve, F., & Antón, J.-I. (2011b). *E pluribus unum?* A critical survey of job quality indicators. *Socio-Economic Review*, 9(3), 445–467. <https://doi.org/10.1093/ser/mwr005>
- Mustosmäki, A., Oinas, T., & Anttila, T. (2016). Abating inequalities? Job quality at the intersection of class and gender in Finland 1977–2013. *Acta Sociologica*, 60(3), 228–245. <https://doi.org/10.1177/0001699316657580>
- Nelson, D. L., & Burke, R. J. (2002). A framework for examining gender, work stress, and health. In D. L. Nelson & R. J. Burke (Eds.), *gender, work stress, and health*. (pp. 3–14). American Psychological Association. <https://doi.org/10.1037/10467-001>
- Neumark, D., & Stock, W. A. (2006). The labor market effects of sex and race discrimination laws. *Economic Inquiry*, 44(3), 385–419. <https://doi.org/10.1093/ei/cbj034>
- Nikolova, M., & Cnossen, F. (2020). What makes work meaningful and why economists should care about it. *Labour Economics*, 65, 101847. <https://doi.org/10.1016/j.labeco.2020.101847>

- Noorbakhsh, F. (2007). International convergence or higher inequality in human development? evidence for 1975–2002. In G. Mavrotas & A. Shorrocks (Eds.), *Advancing Development* (pp. 149–167). Palgrave Macmillan. https://doi.org/10.1057/9780230801462_9
- O'Halloran, P. L. (2008). Gender differences in formal on-the-job training: incidence, duration, and intensity. *LABOUR. Review of Economics and Industrial Relations*, 22(4), 629–659. <https://doi.org/10.1111/j.1467-9914.2008.00427.x>
- Obadić, A., Arčabić, V., & Rogić Dumančić, L. (2021). *Labor market institutions convergence in the European Union* (EFZG Working Paper No. 21–02). Faculty of Economics and Business, University of Zagreb. <http://web.efzg.hr/repec/pdf/Clanak%2021-02.pdf>.
- Obinger, H., & Starke, P. (2015). Welfare State transformation. In S. Leibfried, E. Huber, M. Lange, J. D. Levy, & J. D. Stephens (Eds.), *The Oxford Handbook of Transformations of the State*. Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780199691586.013.24>
- OECD. (2022). *Product Market Regulation statistics [Database]*. Organisation for the Co-operation and Economic Development (OECD). <https://doi.org/10.1787/pm-r-data-en>
- Oostendorp, R. H. (2009). Globalization and the gender wage gap. *World Bank Economic Review*, 23(1), 141–161. <https://doi.org/10.1093/wber/lhn022>
- Ortega, B., Casquero, A., & Sanjuán, J. (2016). Corruption and convergence in human development: Evidence from 69 countries during 1990–2012. *Social Indicators Research*, 127(2), 691–719. <https://doi.org/10.1007/s11205-015-0968-8>
- Oshchepkov, A., & Shirokanova, A. (2022). Bridging the gap between multilevel modeling and economic methods. *Social Science Research*, 104, 102689. <https://doi.org/10.1016/j.ssresearch.2021.102689>
- Otten, S. (2020). *Gender-specific personality traits and their effects on the gender wage gap: a correlated random effects approach using SOEP data* (SOEP Paper on Multidisciplinary Panel Data Research No. 1078). German Institute for Economic Research, Berlin. https://www.diw.de/documents/publikationen/73/diw_01.c.788772.de/diw_sp1078.pdf.
- Panizza, U., & Quiang, C.Z.-W. (2005). Public–private wage differential and gender gap in Latin America: Spoiled bureaucrats and exploited women? *The Journal of Socio-Economics*, 34(6), 810–833. <https://doi.org/10.1016/j.socce.2005.07.022>
- Petó, R., & Reizer, B. (2021). Gender differences in the skill content of jobs. *Journal of Population Economics*, 34(3), 825–864. <https://doi.org/10.1007/s00148-021-00825-6>
- Petrongolo, B. (2004). Gender segregation in employment contracts. *Journal of the European Economic Association*, 2(2–3), 331–345. <https://doi.org/10.1162/154247604323068032>
- Reskin, B. (1993). Sex segregation in the workplace. *Annual Review of Sociology*, 19, 241–270. <https://doi.org/10.1146/annurev.so.19.080193.001325>
- Reskin, B. F., & Bielby, D. D. (2005). A sociological perspective on gender and career outcomes. *Journal of Economic Perspectives*, 19(1), 71–86. <https://doi.org/10.1257/0895330053148010>
- Schäfer, A., & Gottschall, K. (2015). From wage regulation to wage gap: How wage-setting institutions and structures shape the gender wage gap across three industries in 24 European countries and Germany. *Cambridge Journal of Economics*, 39(2), 467–496. <https://doi.org/10.1093/cje/bev005>
- Schönfelder, N., & Wagner, H. (2019). Institutional convergence in Europe. *Economics: The Open-Access, Open-Assessment E-Journal*, 13(2019–3), 1–23. <https://doi.org/10.5018/economics-ejournal.ja.2019-3>
- Schulz, E. (2013). *Employment in health and long-term care sector in European countries* (Supplement to NEUJOBS Working Paper No. D12.1). http://www.neujobs.eu/sites/default/files/Health%20care%20workforce-EU160913_final.pdf.
- Simón, H., Ramos, R., & Sanromá, E. (2014). Immigrant occupational mobility: Longitudinal evidence from Spain. *European Journal of Population*, 30(2), 223–255. <https://doi.org/10.1007/s10680-014-9313-1>
- Stier, H., & Yaish, M. (2014). Occupational segregation and gender inequality in job quality: A multi-level approach. *Work, Employment and Society*, 28(2), 225–246. <https://doi.org/10.1177/0950017013510758>
- The Economist. (2019). Why half the scientists in some eastern European countries are women. *The Economist*. <https://www.economist.com/europe/2019/07/18/why-half-the-scientists-in-some-eastern-european-countries-are-women>.
- Vaughan-Whitehead, D., & Vázquez, R. (2019). Convergence in the EU: what role for industrial relations? In D. Vaughan-Whitehead (Ed.), *Towards convergence in Europe. Institutions, labour and industrial relations* (pp. 1–34). Edward Elgar. <https://doi.org/10.4337/9781788978071>
- Walby, S. (1986). *Patriarchy at work: patriarchal and capitalist relations in employment* (pp. 1800–1984). Cambridge Polity Press.

- Wang, S., Kameråde, D., Burchell, B., Coutts, A., & Balderson, S. U. (2022). What matters more for employees' mental health: Job quality or job quantity? *Cambridge Journal of Economics*, 46(2), 251–274. <https://doi.org/10.1093/cje/beab054>
- Weichselbaumer, D., & Winter-Ebmer, R. (2005). A meta-analysis of the international gender wage gap. *Journal of Economic Surveys*, 9(3), 479–511. <https://doi.org/10.1111/j.0950-0804.2005.00256.x>
- Weichselbaumer, D., & Winter-Ebmer, R. (2007). The effects of competition and equal treatment laws on gender wage differentials. *Economic Policy*, 22(50), 235–287. <https://doi.org/10.1111/j.1468-0327.2007.00177.x>
- Williams, L., & Rubin, B. (2003). Integrating economic dualism and labor market segmentation: The effects of race, gender and structural location on earnings, 1974–2000. *The Sociological Quarterly*, 44(3), 405–432. <https://doi.org/10.1111/j.1533-8525.2003.tb00539.x>
- Winter-Ebmer, R. (1995). Sex discrimination and competition in product and labour markets. *Applied Economics*, 27(9), 849–857. <https://doi.org/10.1080/00036849500000038>
- World Bank. (2022). *World Development Indicators Database* [Database]. The World Bank. <https://databank.worldbank.org/source/world-development-indicators/>.
- Yaish, M., & Stier, H. (2009). Gender inequality in job authority: A cross-national comparison of 26 countries. *Work and Occupations*, 36(4), 343–366. <https://doi.org/10.1177/0730888409349751>
- Zweimüller, M., Winter-Ebmer, R., & Weichselbaumer, D. (2008). Market orientation and gender wage gaps: An international study. *Kyklos*, 61(4), 615–635. <https://doi.org/10.1111/j.1467-6435.2008.00419.x>

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