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D2.3- An Analysis of Industrial Relations and Gender Equality in European Member States

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Abstract

This paper uses the Industrial Relations (IR) index built by Ounnas (2022), to investigate the relationship between gender equality and IR regimes in European countries. The Gender Equality Index (GEI) published by the European Institute for Gender Equality (EIGE) is our main dependent variable. The GEI encompasses many aspects of gender equality, and as such, it captures the multidimensional nature of gender inequalities. We further use individual-level data from four waves of the Structure of Earnings Survey (SES) between 2006 and 2018 to study the links between IR and the gender pay gap in hourly earnings. Although data limitations should be kept in mind, the results point to a positive association between gender equality and IR characterised by strong social partners, social dialogue and collective bargaining.

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List of Acronyms

CA collective agreements

CB collective bargaining

EIGE European Institute for Gender Equality

EO employers' organisations

EU European Union

GE gender equality

GEI Gender Equality Index

GPG gender pay gap

IR Industrial Relations

LP liberal pluralist

OC organised corporatism

SC state-centred

SES Structure of Earnings Survey

SP social partnership

TU trade unions

WC work councils

1 Introduction

Achieving gender equality (GE) in society, and particularly on the labour market, has been at the centre of several policies promulgated by governments around the world. Anti-discriminatory laws, quotas or pay-transparency requirements are examples of such policies. International organisations also advocate for GE as exemplified by the United Nations Sustainable Diversity Goals (SDGs) or the International Labor Organization Convention to combat violence and harassment in the world of work[3]. In the European Union (EU), GE has always been a central objective, present since the 1957 Treaty of Rome under the principleof equal pay for work of equal value, and reasserted more recently in the European Pillar of Social Rights (second principle) and the Gender Equality Strategy 2020-2025[4].

In the labour market, the gender pay gap (GPG) is one of the main indicators of GE, and it has been extensively studied in the academic literature (Blau and Kahn, 2003; Goldin, 2014; Kunze, 2018). In advanced economies, the GPG hovers around 15-20 %, with large variations across countries and sectors. The GPG can be partly explained by differences in men's and women's characteristics, such as human capital (e.g. education, job tenure), their occupations and sectors or the type of employment (see Blau and Kahn, 2017, for a review of the main factors contributing to the GPG). Following the increase in education and labour market participation of women, the GPG has been closing since the 1970s. Most of the reduction occurred in the 1980s and the progress since has been slow and marginal (Blau and Kahn, 2017).

Focusing on a single indicator makes it easier to quickly grasp the extent of GE in the labour market, but fails to recognise the multidimensional nature of the problem (Baiocco et al., 2021). The GPG interacts with other forms of inequalities such as the gender care gap, occupational and sectoral segregation, the employment gap (full-time, part-time and temporary work) or gender-based violence at the workplace. In an effort to account for all these dimensions, the European Institute for Gender Equality (EIGE) publishes the Gender Equality Index (GEI) for all EU countries. This index is constructed from indicators related to additional gender gaps (or domains) and does not only focus on the GPG. More precisely, six domains are considered by the EIGE: work, money, knowledge, time, power and health. Subdomains are associated with each of these domains and built from various statistical indicators. As such, the GEI, and the indicators composing it, offers a more complete and accurate picture of the current state of GE in Member States. The latest issue of the GEI in 2021 (based on 2019 data) ranks Sweden first and Greece last. This underlines a geographical divide between Northern European countries, which tend to perform relatively well in terms of GE, and Southern/Eastern European countries.

The multifaceted nature of GE is particularly relevant since it highlights the need for a comprehensive approach to address this issue. For instance, coercive approaches on the labour market tackling specific dimensions (e.g. quotas for occupational segregation), are likely to be insufficient as issues related to gender stereotypes - homecare activities or educational/training choices - also need to be addressed. Furthermore, successful policies should rely on the involvement of many actors (e.g. governments, NGOs, civil society) among which social partners (trade unions (TU) and employers' organisations (EO)).

Social partners are central actors to Industrial Relations (IR) regimes (or systems, Dunlop (1993)). IR refer to the set of rules/institutions and actors which frame and organise the employment relationship (Kaufman, 2004). IR has been a field of research for more than a century, situated at the frontier between economics, political science, and sociology. In general, comparative IR studies focus on differences in IR regimes at national level[5], and identify shared characteristics across countries to build typologies/classifications of various regimes (Visser, 2009b Meardi, 2018; Eurofound, 2018). In addition to usual IR variables on TU membership and collective

[3] https://sdgs.un.org/goals and https://www.ilo.org, respectively.
[4] https://ec.europa.eu/info/EPSR and https://eur-lex.europa.eu.
[5] Exceptions are, for instance, Bechter et al. (2012) who study industrial relations at sectoral level in Europe, and Regalia (1998) who analyses IR at regional level in France, Germany, Italy and Spain.

bargaining (CB), these typologies make use of other dimensions such as the involvement of workers at the firm level (through work councils (WC) or company boards) or the space given to social dialogue in policymaking (Visser, 2009a; Eurofound, 2018). Simplifying the findings, these typologies usually report similar IR regimes in countries corresponding to geographical areas such as Scandinavia or Western Continental Europe. To some extent, there is some overlap between these groups of countries and those suggested by the GEI.

As noted by Healy et al. (2006) or Williamson and Baird (2014), IR studies have long been 'blind' to GE issues, in part because of the dominance of the male breadwinner model. However, IR actors and institutions play a central role in shaping labour market outcomes and can therefore be key levers to reduce gender gaps (Eurofound, 2014). With regards to the GPG, Card (1996), Elvira and Saporta (2001) or Card et al. (2020) have shown that that TU membership tends to be associated with a wage premium implying that gender differences in TU density could contribute to the GPG. Moreover, CB has been shown to impact the GPG because more centralised and coordinated wage bargaining systems usually result in more compressed wage distributions (Freeman, 2007; Rubery and Johnson, 2019), with the imposition of higher wage floors(Blau and Kahn, 2003; Schäfer and Gottschall, 2015) and the pursuit of more egalitarian pay policies by TU (Cardoso and Portugal, 2005). These effects reduce wage inequalities and benefit workers at the lower end of the wage distribution, women in particular. Another interesting point regards multi-tier bargaining systems that allow for both multi (e.g. sectoral level) and single-employer(s) negotiations[6]. Cardoso and Portugal (2005) or Plasman et al. (2007) have shown that single-employer bargaining tends to increase wages (a wage cushion effect) above the level set at the multi-employer (higher) level, leading in turn to an increase in wage dispersion[7] since wage cushions can vary across firms. Given evidence on men sorting in higher wage firms, enterprise-level bargaining and firm-specific pay policies have been identified as a potential contributor to GPG in recent years (Card et al., 2016; Bruns, 2019). Other IR aspects, such as worker representation through WC at the firm level, have been shown to potentially affect the GPG as well (Gartner and Stephan, 2004; Heinze and Wolf, 2010,for Germany)[8].

Although the evidence discussed above has been focused primarily on the GPG, social partners and IR can also affect additional gender gaps. For example, collective agreements (CA) on working time or parental leave[9] could help to close the gender care gap by facilitating the reconciliation of work and personal life (which could in turn affect the GPG). Furthermore, CA can be made to tailor and improve working conditions to ensure that women can take jobs in better and more suitable conditions. This improvement could affect the gender employment gap as well as sectoral and occupational segregation[10]. These broader effects of collective negotiations translate into the concept of equality bargaining (Williamson and Baird, 2014), which highlights the potential central role of IR in progressing towards GE. Overall, this (non-exhaustive) review of the literature suggests that IR regimes can affect GE through many different channels.

In this paper, we seek to provide additional evidence on the potential association between GE and IR. We start by taking a broad approach to GE to account for its multidimensional nature. The EIGE indices are used as main dependent variables since these indices are computed using indicators on many GE dimensions (e.g. time, work, power). In a second step, we focus more specifically on the relation between IR regimes and the GPG. The paper is organised as follows: Section 2 proposes an analysis of gender

[6] Interest in these multi-tier systems has also been driven by the bargaining reforms in many Member States after the Great Recession (Visser, 2016).

[7] Canal Dominguez and Gutierrez (2004) and Dell'Aringa and Pagani (2007) report more nuanced results on single-employer bargaining and wage dispersion. The case of Spain (Canal Dominguez and Gutierrez, 2004) is interesting since single-employer bargaining can only be conducted in firms with a certain level of TU representation. Single-employer bargaining therefore happens only in firms with strong union representation. The lower wage dispersion could then potentially be explained by the relatively strong unions using single-employer bargaining to reduce wage differences between and within firms (Plasman et al., 2007).

[8] In a more recent contribution, Oberfichtner et al. (2020) report no effects of work councils on the GPG.

[9] For example, in Sweden, CA include a top-up on parental leave benefit to incentivise more men to use their leaves.

[10] The recent EU-level sectoral agreement on women in rail constitutes such an example. See ec.europa.eu.

equality and IR at macro (country) level; Section 2.1 presents the data from the EIGE, the IR index and the control variables used for the empirical analysis. The results are discussed in Section 2.2. In Section 3, we look more closely at the GPG using micro-level data from the Structure of Earnings Survey (SES). The data and methodology used to compute our measures of the GPG are presented in Sections 3.1 and 3.2. Empirical results on the links between the GPG and IR are then examined in Section 3.3. Section 4 concludes.

2 Macro-level analysis

2.1 Data

2.1.1 EIGE indices

Since 2005, the EIGE has published a composite indicator allowing for an evaluation of GE in European Member States[11]. The index is built from 31 statistical indicators aggregated into 14 subdomains and 6 domains (see Table 1). The indicators are usually included as gaps (differences) between women's and men's statistics such that a zero gap indicates the desired situation. The indicators are also rescaled to account for their levels. Aggregation is then performed by computing arithmetic/geometric means at the (sub)domain levels. The overall GEI is obtained as a weighted geometric means with weights determined from expert opinions. A value of 100 in any of the (sub)indices indicates a situation of full equality. See European Institute for Gender Equality (2017) for methodological details behind the construction of the indices and Papadimitriou et al. (2020) for an evaluation of the methodology.

The composite indicator is available for the years 2005, 2010, 2012, 2015, 2017 and 2018[12]. We focus on the GEI as well as the six domains displayed in Table 1. Table 2 shows mean values for indices by countries and for the EU27 as a whole. The table also displays average values for the five types of IR regimes identified by Visser (2009b). At the EU27 level, these indices indicate that GE is far from being achieved[13]. The highest average value is obtained for the health domain at 85.7, still substantially far below the desired level of 100.The money and work domains follow with values above 70. A value of 41.2 for the power domain indicates that substantial improvements are needed to support the representation of women in executive positions.

As can be anticipated, there exists a large heterogeneity between Member States. Higher values for all the indices can be observed for Nordic and Western Continental European countries. Sweden obtains the highest values in all domains except knowledge (Denmark). Index values for Southern, Central and Eastern countries (with the exception of France and Slovenia) are generally lower. Hungary and Romania get the lowest average values for the overall index. Romania performs poorly in the money, knowledge and health domains, whereas Hungary obtains the lowest value for the power domain, followed closely by Cyprus and Greece. Greece (and Italy) obtains the lowest value for the work domain.

A similar picture emerges when analysing these indices by IR regimes, which is not really surprising given the strong geographical dimension behind Visser's typology. It is interesting to note that the liberal pluralist (LP) regime appears as the third best IR regime in terms of all the domains except power. Overall, the descriptive evidence in Table 2 suggests that substantial differences exist in terms of GE between IR regimes. Moreover, the degree of geographical overlap between high GE indices and IR regimes with strong social partners (i.e. organised corporatism (OC) and social partnership (SP)) could suggest a positive association between the two concepts. Note, however, that the relatively high values obtained by LP countries could indicate a potential

[11] https://eige.europa.eu/gender-equality-index.

[12] Since the first draft of this paper, the 2019 index has been released. Note also that the EIGE used to label their indices based on the year of the used data. In more recent releases, the EIGE started using the year in which the indices were published as label. We keep their original labelling (based on the year of the data). Furthermore, 2005 and 2010 data are now aggregated into their current 2013 index. We keep these indices separated as this provides an additional observation for each EU Member State. See https://eige.europa.eu/gender-statistics/metadata for additional information.

[13] For a much more detailed review of the state of GE in Europe, see https://eige.europa.eu/publications/gender-equality-index- 2021.

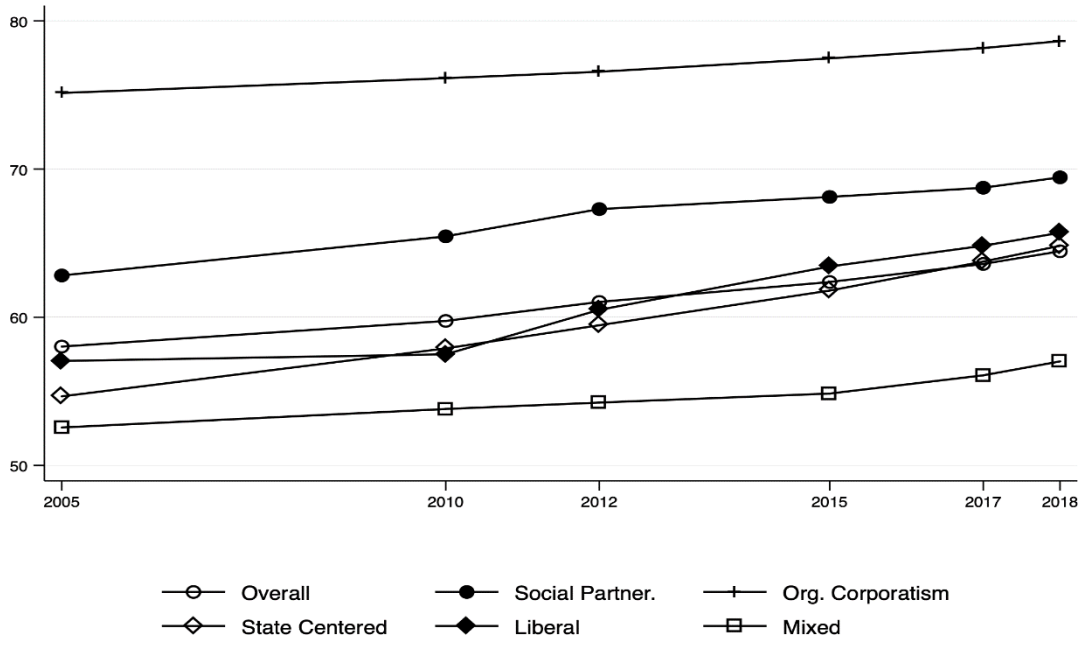
non-linear relationship given that social partners and CB are rather weak in these countries. Finally, Figure 1 and Figure 2 display the evolution of indices through time for the EU27 and the five types of IR regimes. These figures show that the GEI, and most of its domains, exhibit (slight) positive trends between 2005 and 2018, unconditional on any particular IR regimes. Exceptions to this general increase are seen for the health domain, whose level was already relatively high in 2005, and the time domain. For this latter domain, the stagnation is widespread across IR regimes and the evolution between 2005 and 2018 follows a similar dynamic with a decrease in 2010, coinciding with the Great Recession, and a slow recovery afterwards. It is also worth noting the stagnation in the money domain for state-centred (SC) countries between 2010 and 2018 and in the knowledge domain for OC (2015-2018) and SP countries (2012-2018).

Table 1. EIGE index - indicators, subdomains and domains

Domain	Subdomain	Indicator
Work	Participation	(1) Full-time equivalent employment rate
		(2) Duration of working life
	Segregation and quality of work	(1) Employed in education, human health and social work activities
		(2) Ability to take an hour or two off during working hours to take care of personal or family matters
		(3) Career Prospect Index
Money	Financial resources	(1) Mean monthly earnings
		(2) Mean equivalised net income
	Economic situation	(1) Not-at-risk-of-poverty, ≤60 % of median income
		(2) S20/S80 income quintile share
Knowledge	Financial resources	(1) Mean monthly earnings
		(2) People participating in formal or non-formal education and training
	Segregation	(1) Tertiary students in the fields of education, health and welfare, humanities and arts (tertiary students)
Time	Care activities	(1) People caring for and educating their (grand)children, elderly or people with disabilities, every day
		(2) People doing cooking and/or housework, every day
	Social activities	(1) Workers doing sporting, cultural or leisure activities outside of their home, at least daily or several times a week
		(2) Workers involved in voluntary or charitable activities, at least once a month
Power	Political	(1) Share of ministers
		(2) Share of members of parliament
		(3) Share of members of regional assemblies
	Economic	(1) Share of members of boards in largest quoted companies, supervisory board or board of directors
		(2) Share of board members of central bank
	Social	(1) Share of board members of research funding organisations
		(2) Share of board members in publicly owned broadcasting organisations
		(3) Share of members of highest decision-making body of Olympic sport organisations
Health	Status	(1) Self-perceived health, good or very good
		(2) Life expectancy in absolute value at birth
		(3) Healthy life years in absolute value at birth
	Behaviour	(1) People who do not smoke and are not involved in harmful drinking
		(2) People doing physical activities and/or consuming fruits and vegetables
	Access	(1) Population without unmet needs for medical examination
		(2) People without unmet needs for dental examination

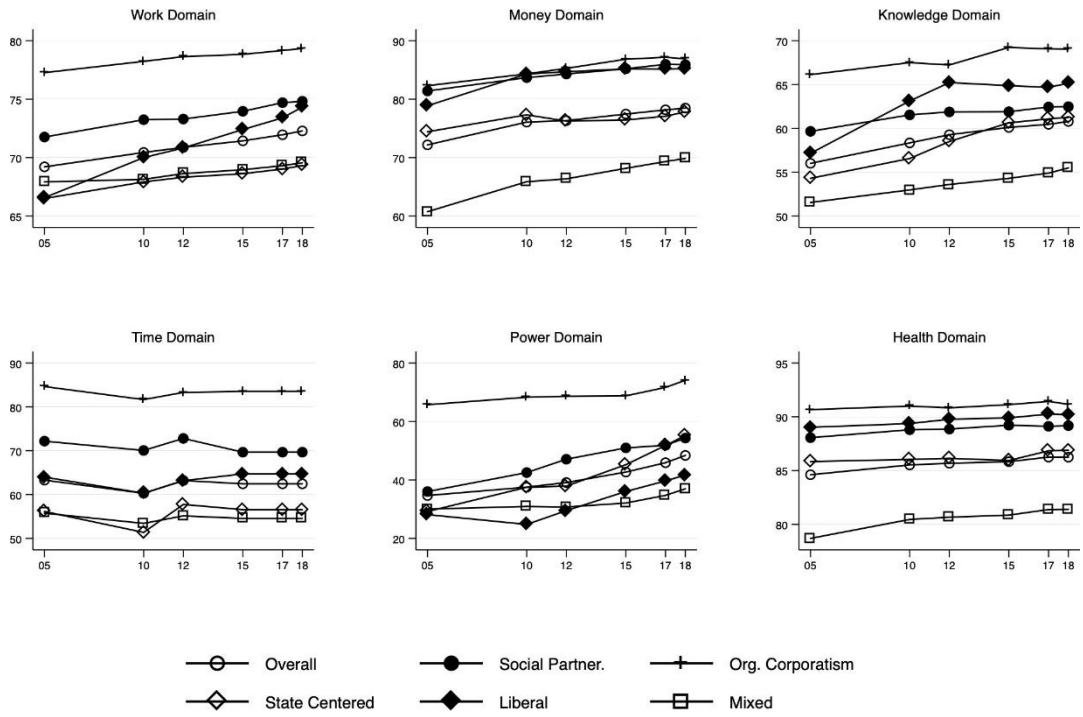
Source: Papadimitriou et al. (2020).

Figure 1. Gender Equality Index 2005-2018



Source: EIGE.

Figure 2. EIGE domains - 2005-2018



Source: EIGE

Table 2. EIGE indices averages - 2005-2018

	GEI	Work	Money	Knowledge	Time	Power	Health
Organised corporatism	77.0	78.6	85.5	68.0	83.4	69.5	91.0
Denmark	76.2	79.5	85.4	72.6	83.0	60.5	90.1
Finland	73.4	74.8	85.0	59.8	79.1	69.1	89.5
Sweden	81.4	81.5	86.0	71.8	88.0	79.0	93.5
Social partnership	66.9	73.4	85.7	62.7	70.6	45.8	89.0
Austria	62.4	75.6	84.6	61.5	60.9	34.6	91.5
Belgium	69.8	73.2	86.1	70.5	68.7	50.4	86.4
Germany	64.6	70.7	84.3	54.9	66.5	47.9	89.5
Luxembourg	66.7	72.5	92.2	67.6	70.4	38.9	89.5
Netherlands	72.5	76.5	85.9	66.6	85.1	52.3	89.9
Slovenia	65.7	72.1	81.0	54.8	72.1	50.4	87.0
State-centred	60.4	68.3	76.6	58.7	55.8	42.8	86.3
Greece	49.8	63.8	72.1	53.5	43.5	22.6	83.9
Spain	67.7	71.8	76.2	64.5	62.8	56.6	89.3
France	70.6	71.9	84.7	64.2	68.0	62.9	87.0
Italy	57.9	62.2	78.4	58.2	59.1	35.4	87.0
Portugal	55.9	71.8	71.4	53.2	45.8	36.4	84.2
Liberal pluralist	59.8	70.8	81.1	61.9	61.3	31.4	89.8
Cyprus	52.3	69.6	79.5	54.7	48.9	22.0	87.3
Ireland	68.0	73.9	84.4	65.7	74.0	44.6	90.7
Malta	59.0	69.0	79.6	65.4	61.1	27.7	91.5
Mixed	54.8	68.8	66.7	53.8	54.7	32.6	80.6
Bulgaria	57.4	68.4	60.3	52.7	45.0	53.5	75.7
Czechia	55.2	65.9	74.6	56.7	55.4	28.2	85.8
Estonia	56.0	71.5	65.8	53.3	73.8	27.6	81.8
Croatia	53.6	68.6	70.1	49.0	51.0	31.3	82.7
Hungary	51.6	66.7	70.2	56.1	55.5	20.5	85.5
Lithuania	55.6	73.0	63.1	55.3	52.2	33.5	79.4
Latvia	57.2	73.4	61.6	48.8	63.2	40.0	77.4
Poland	55.4	66.5	70.8	56.8	53.6	31.0	82.1
Romania	52.2	67.8	59.4	50.2	50.6	33.3	70.4
Slovakia	53.3	65.6	71.2	59.2	46.2	26.9	85.0
EU27	61.5	71.0	76.4	59.2	62.4	41.4	85.7

Source: EIGE indices.

2.1.2 Industrial Relations

Quantifying IR is not an easy task since IR regimes are complex combinations of institutions shaped by historical and cultural traditions (Crouch, 1993; Black, 2005). There is therefore a substantial heterogeneity in cross-country IR systems and the construction of a composite measure is bound to generalisations and simplifications. These indicators can nonetheless be useful to rank and identify groups of countries (Kim et al., 2015; Eurofound, 2018), or perform quantitative analysis (Marginson, 2017; Meardi, 2018)[14]. In this paper, we use the index built by Ounnas (2022). Compared to other IR indices, this index has the advantage of being available at yearly frequency (1995-2019) and for all 27 EU countries (+ the U.K.). The index is constructed using 24 variables from the OECD/AIAS ICTWSS database. The variables are selected to match the four dimensions of IR regimes that Visser (2009a) uses to build his typology (see Table 3).

[14] We can also mention the literature building indices on specific aspects of IR such as bargaining (Garnero, 2021), worker participation (Vitols, 2010) or TU strength (Metten, 2021). Traxler et al. (2001) construct measures for a wide range of IR dimensions.

Table 3. Industrial Relations index - dimensions and variables

Dimensions	Variables
Trade union strength	(1) Trade union density (2) Number of unions' confederations (3) Labour market tightness (4) Government employment share (5) Hiring and firing regulations (Economic Freedom Index)
Bargaining	(1) Adjusted bargaining coverage (2) Predominant bargaining level (3) Coordination mechanisms (4) Type of coordination (5) Extension (6) Favourability principle (7) Opening clause
Workers/unions' involvement at firm level	(1) Existence of work councils (2) Work council type (3) Work councils' rights (4) Work council structures (5) Work councils' negotiations rights (6) Union workplace representation
Social partners' participation in policy debates/making	(1) Tripartite councils (2) Bipartite councils
Other	(1) Private employers' organisations density (2) Number of employers' organisation confederations (3) Right to strike in government sector (4) Right to collective bargaining in government sector

Source: Ounnas (2022).

The index is constructed using Multiple Correspondence Analysis (MCA) (Le Roux and Rouanet, 2010), which can be seen as a counterpart to Principal Component Analysis (PCA) for categorical data[15]. As in PCA, MCA extracts latent components from the data that are ranked such that the first component explains the largest share of the inertia/variance in the data. Ounnas (2022) then shows that the first component tends to split the sample between Northern/Western European countries and Eastern/Anglo-Saxon ones, with Southern countries in between these two groups. As a result, it is not really surprising to see EU countries separated along usual aspects considered in the comparative IR literature. The important variables and characteristics to split the sample are as follows:

1. high TU and EO density rates (vs low density rates)
2. some degree of centralisation and coordination of wage bargaining (vs enterprise/company bargaining and no coordination)
3. automatic extension of CA to non-covered employees resulting in high bargaining coverage rates (vs no mechanism for extension and low coverage)
4. involvement of workers/unions at the firm level through WC or union workplace representation together with substantial information and consultation rights.

[15] Most variables displayed in Table 3 are categorical with few exceptions (e.g. TU density), which are categorised to apply MCA.

These categories tend to be more specific to Nordic and Western Continental European countries and, to some extent, to Latin/Southern European countries. These countries correspond to the OC and SP regimes identified by Visser (2009b) (SC, for Southern European countries). The index thus leads to a ranking of countries 'consistent' with Visser's typology. In general, OC and SP countries obtain high values, SC countries intermediate ones and LP and Mixed countries low ones. High values of the index are attributed to IR systems satisfying all, or most, of the characteristics enumerated above. Hence, these systems appear to be characterised by the substantial role given to social dialogue and collective bargaining.

Table 4 displays the IR index mean values for the six periods of interest and Figure 3 in Appendix A.1 plots IR index time series by countries. From Table 4, Belgium is ranked first, followed by Sweden, whereas Poland and Latvia obtain the lowest values. The country values and ranking for some countries can sometimes be surprising. For instance, Italy and France obtain relatively high values on average, above Austria, Germany or Luxembourg. This difference comes from the latter countries' relatively low scores on *TU strength* which can be explained by less stringent hiring/firing regulations - seen as lowering the strength of unions (Metten, 2021) - and a smaller government sector employment share (particularly in Luxembourg and Germany) - which is positively correlated with TU density (Schnabel, 2013) and usually considered as a stronghold sector for unions. The low TU density in Germany and to some extent in Austria, lower than Italy's density rate, also contributes negatively to the *TU strength* score. Italy also obtains a high score on the *bargaining* dimension[16] whereas France gets a high score on the dimension related to *involvement*. For Germany, the relatively low bargaining coverage rate influenced by the absence (or rarity) of legal provisions for automatic extension[17] explains its lower bargaining score compared to Austria, Belgium or the Netherlands. Finally, note that even though Eastern European countries (mixed regime countries) are found in the bottom half of Table 4, there is substantial heterogeneity in average country scores, which range from 15.5 in Poland to 42.9 in Slovakia. More details on the IR index construction and results can be found in Ounnas (2022).

This index is the main variable used to identify potential links between our variable of interest (the GEI) and IR. We are also interested in studying the effect of a gendered IR variable. One possibility is TU density by gender. The main issue is that male and female TU density time series contain many missing values. We therefore need to adjust the original series which is discussed in more detail in the Appendix A.2.

2.1.3 Control variables

The control variables are all extracted from Eurostat and can be classified into four groups, briefly described below.

A first set of variables is meant to capture differences in macroeconomic and labour market performances across Member States. These include GDP per capita, the labour force participation (lfp) rate, unemployment, part-time and temporary employment rates. Labour market variables are obtained by gender and transformed into differences (gaps) between female and male rates.

The second group of variables captures differences in the characteristics of the populations. These variables include the number of marriages per 1 000 individuals aged 18 and over and the number of births per 1 000 women aged 16 and over. Eurostat further provides data on the share of the population with 0 to 2 years, 3 to 4 years and 5 to 8 years of education. The share of employed workers by tenure can also be obtained for four different lengths: 0 to 1 year excluded (i.e. 0 to 11 months), 1 to 2 years, 2 to 5 years and more than 5 years. Education and tenure variables are available by gender and included in our analysis as gap variables too.

The third set of variables includes data on social expenditures from the ESSPROS database. We focus on social protection benefits in the family/children function and ignore the means vs non-means-tested dimension. In this function, we select expenditures on social protection benefits (SPB), family/child allowance (FCA) and child

[16] For instance, compared to France, a coordination mechanism can be identified in Italy. See also Meardi (2018) who obtains high IR index value for Italy.

[17] As in Denmark and Sweden, although other mechanisms exist in these countries to extend CA, and thus, the bargaining coverage is higher than in Germany.

day care (CDC). These variables are expressed in GDP percentages.

The last group of variables relates to the sectoral and occupational composition of employment. For sectoral data, we have to account for the NACE revision of 2008. To the best of our knowledge, there is no readily available crosswalk between the two classifications that would allow for a consistent measure of sectoral employment across the revision. To limit the scope for abrupt changes in sectoral composition, we aggregate one-digit sectors into broader groups, taking as a reference the NACE2 classification. For example, we aggregate employment in sectors B (mining and quarrying) to F (construction) including manufacturing (C), electricity (D) and water supply (E). In terms of NACE1, these major sectors are those corresponding to sectors C to F. This broader group corresponds approximately to industrial and manual labour employment. The second group aggregates sectors G (wholesale and retail trade) to N (administrative and support services activities) which corresponds, more or less, to the service sector. Sector O is the public administration sector and P-U aggregates employment in the education sector (P) to activities of extraterritorial organisations (U). For occupational employment, we consider major groups defined by the ISCO classification. We drop the major groups 6 (skilled agricultural, forestry and fishery workers) and 7 (craft and related trades workers) before computing employment shares as data on these two groups are not available for all countries. Table 13 in Appendix A.3 displays average values for all the control variables considered in the analysis.

Table 4. Industrial Relations index - descriptive statistics 2005-2018

	Index	TU	Barg.	Involv.	Part.	Other
BE	92.5	15.5	32.2	28.7	6.0	10.1
SE	88.7	14.7	25.3	31.4	6.0	11.4
NL	82.8	12.4	29.7	25.7	4.4	10.6
DK	80.0	14.0	25.3	28.8	5.2	6.6
FI	79.8	13.9	31.4	26.0	0.0	8.5
IT	76.4	8.7	30.2	27.0	0.3	10.2
FR	73.9	10.1	26.3	30.0	0.3	7.2
AT	73.7	4.5	30.5	26.9	4.4	7.4
DE	67.5	7.9	26.4	26.9	1.6	4.7
SI	66.8	8.3	26.8	21.5	0.0	10.3
ES	58.7	4.2	26.6	21.5	0.0	6.4
LU	53.8	5.2	14.4	27.4	0.0	6.8
PT	53.1	4.2	25.7	18.5	0.3	4.4
SK	42.9	5.8	11.6	17.8	2.9	4.8
HR	37.6	6.9	8.0	17.4	0.3	5.1
IE	35.9	2.9	10.2	13.8	0.2	8.9
EL	33.4	3.1	13.9	13.5	0.3	2.6
RO	33.3	5.1	13.9	12.3	0.1	2.0
UK	33.1	4.8	11.7	10.2	1.6	4.8
CZ	32.0	6.2	6.2	18.9	0.0	0.7
HU	31.4	3.9	4.1	21.5	0.2	1.6
BG	30.8	3.8	13.3	9.4	0.0	4.3
EE	29.4	3.5	7.8	14.6	1.3	2.1
CY	25.1	5.5	12.5	0.0	0.0	7.1
LT	20.4	5.8	3.5	9.4	0.0	1.7
MT	17.7	8.1	2.5	0.3	0.3	6.5
LV	15.9	2.3	2.7	9.4	0.0	1.5
PL	15.5	5.5	1.2	7.9	0.0	1.0

Source: Ounnas (2022).

Notes: The index values are obtained as the sum of the five dimensions displayed in columns 3 to 7. See Table 3 for more information on the variables associated with each of these dimensions. Blue (red) cells indicate high (low) values.

2.2 Gender equality indices and Industrial Relations

This section analyses the relationship between GE, as measured by the EIGE indices, and IR, captured by our index. The dependent variables are the GEI and the six domains found in Table 1 (i.e. work, money, etc). We include the gender gap in TU density and further control for economic, social and population factors that could also affect GE at country level. Given the high number of control variables (particularly in relation to the number of panel units), we perform a simple selection based on the statistical significance and/or the expected signs of these variables. The sample is a longitudinal dataset of 27 EU Member States for six periods between 2005 and 2018. We estimate pooled Ordinary Least Squares (OLS) regressions and two simple static panel data specifications: random effects (RE) and fixed effects (FE). We do not include dynamic effects given that EIGE indices are available at uneven time intervals, although some methods exist to account for this issue (Millimet and McDonough, 2017).

Estimated parameters for the IR index from pooled OLS and RE are usually of the same signs and magnitudes, but RE estimates are more precise. The FE estimation is likely to be the most relevant and consistent one given that some (constant) country-specific factors, not included in the specification, could affect IR and GE indices. However, there can be little variability in the IR index for some countries (see also Figure 3 in the Appendix) such that the inclusion of FE absorbs the small variations in IR indices and complicates the identification of the effects. As a result, RE is our preferred specification[18]. The results are presented and discussed in the following section whereas additional details on the results can be found in Appendix A.4.

Note that throughout section 2.2.1, we remain careful in interpreting the estimated effects of IR on GE as causal since omitted variables could bias the estimates (e.g. cultural factors that could explain both IR and better performance in GE)[19]. The results should therefore be seen as indicating a correlation between IR and GE controlling for economic, population and social factors. Finally, the small number of individual units (countries) provides additional incentives to be careful when analysing the results (Cameron and Miller, 2015), in particular with regards to statistical testing.

As robustness checks on the RE results, we explore two additional specifications. First, we exploit the fact that our control variables differ across dependent variables to estimate seemingly unrelated regressions (SUR) with random effects (Biørn, 2004; Nguyen and Nguyen, 2010) for the six domains considered in the analysis. We do not include the GEI given that it is obtained as a weighted average of the six domains. In SUR, each equation of the system is linked through contemporaneous correlation between error terms.This can lead to significant gain in efficiency of the estimation by exploiting information contained in other equations (Perron and Moon, 2008). The main drawback is that clustered standard errors cannot be computed when RE are included and inference on the parameters of interest should therefore be taken with some care. Second, we swap the IR index for each IR dimension identified by Visser (2009a) and which can be found in Table 4. This allows a closer analysis of whether any specific dimension drives the results obtained using the overall IR index.

2.2.1 Estimation results

For country *i* and year *t*, the RE specification for the GEI and its six domains is the following:

$$y_{i,t} = \mu + \gamma_1 \Delta UD_{i,t} + \gamma_2 IR_{i,t} + \beta X_{i,t} + \eta_t + \alpha_i + \varepsilon_{i,t} \quad (1)$$

where $\Delta UD_{i,t}$ is the difference in union density between female and male, $X_{i,t}$ is the vector of control variables

[18] A solution for (almost) time-constant variables would be to use Correlated Random Effects (Wooldridge, 2019). We do not pursue this alternative but we perform cluster robust Hausman tests using the auxiliary regression procedure proposed by Wooldridge (2010). The null hypothesis is only rejected for the knowledge domain at a 5 % significance level when a quadratic form for the IR index is included in the specification. Therefore, RE estimation should lead to consistent estimates. See Hoechle (2007) for additional details on the test. Furthermore, a Breusch-Pagan LM test on the variance of the individual effect always rejects the null hypothesis of null variance and favours RE over pooled OLS. P-values from these tests are displayed in Table 5.

[19] On this matter, Black (2005) argues that cultural factors, such as the preference for inequality, are important to explain country variations in IR regimes. Such cultural factors could also affect GE.

and η_t are year dummies meant to capture any time effects common to all countries (in particular, the positive trend in the GEI and most of its domains displayed in Figure 2). We assume that country specific effects, α_i, are random and uncorrelated with the idiosyncratic error term, $\varepsilon_{i,t}$.

The SUR specification can be written by stacking together individual equations for the six domains of GE:

$$\boldsymbol{y}_{i,t} = \boldsymbol{\mu} + \boldsymbol{\gamma_1}\Delta UD_{i,t} + \boldsymbol{\gamma_2} IR_{i,t} + X_{i,t}\boldsymbol{\beta} + \boldsymbol{\eta}_t + \boldsymbol{\alpha}_i + \boldsymbol{\varepsilon}_{i,t} \quad (2)$$

with $\boldsymbol{y}_{i,t} = (work, money, \dots, health)'_{i,t}$, $\boldsymbol{\gamma_1}$, $\boldsymbol{\gamma_2}$, $\boldsymbol{\eta}_t$ and $\boldsymbol{\alpha}_i$ are 6×1 vectors of parameters, time effects and country-specific effects. The vector of error terms is $\boldsymbol{\varepsilon}_{i,t} \sim N(0, \Sigma)$.

For each of these models, we further check whether the relationship between the GEI and IR is non-linear by including an IR index quadratic term. We then check the significance of the non-linear effect using the statistical test proposed by Lind and Mehlum (2010). The inclusion of a non-linear effect is motivated by the observation that LP countries, which obtain low IR index values, can often obtain high values for some GE dimensions (see section 2.1.1). The set of control variables, included in $\boldsymbol{X_{i,t}}$, is specific to each GE domain but common to the RE and SUR specifications and the linear and quadratic effect estimations. More specifically, we estimate model (1) assuming linear effects of IR and including all control variables available. We then remove variables one by one based on their statistical significance and/or expected signs, starting from the estimate with the lowest p-value. Table 5 displays estimated parameters for the IR index and the TU gender gap obtained through the RE and SUR specifications, whereas Table 6 presents the results for each IR dimension separately. The full set of results, including estimated parameters for the control variables, can be found in Appendix A.4.

Results for the RE estimation and linear effects (top panel and column (1) in Table 5) show that the IR index has a positive and significant effect on the GEI and two of its six domains, namely money and power. The four other domains do not show any significant association with the IR index, although we can note that all estimated coefficients are positive. Turning our focus to potential non-linear effects of IR, we see that the results tend to support this possibility as indicated by the F-tests results, but the U-tests suggest that the IR effects are strictly increasing in the IR index over its interval of values rather than (inverted) U-shaped. Indeed, estimated coefficients for the money and power domains are both positive whereas the turning points lie close to the lower bound of the IR index range for the GEI. The U-test is thus not computed for the money and power domains and the null hypothesis of monotone or inverse U-shaped effects cannot be rejected for the GEI. Therefore, the results suggest that the positive effects of IR on GE are strictly increasing in the IR index values[20]. Recalling that high index values are obtained for countries with IR regimes characterised by the substantial role given to social dialogue through and with strong social partners (section 2.1.2), the increasing effects suggest larger positive effects of IR on GE, the more developed are such characteristics.

Before looking at the results from the SUR estimation, it is worth mentioning that IR could have U-shaped effects on the time domain with the effects becoming positive for relatively high values of the index (above 65). However, the estimated parameters are only jointly significant at the 10 % level. Finally, note that gender gaps in TU density are never found to be significant, bearing in mind the limitations associated to these series stemming from the data and the required adjustments (see Appendix A.2).

From the SUR model, the estimation results confirm the positive association between IR and the money and power domains, although the effect is positive on the latter domain now for IR index values above 53. Estimated effects seem to be strictly increasing with the IR index again as the U-shaped effect for the power domain appears to be irrelevant[21]. Additional positive coefficients for IR are reported for the time and health domains. For the health domain, the coefficient in the linear specification is small (similar to the RE coefficient) and the quadratic specification indicates a potential U-shaped effect of IR on this domain. The effect of IR is decreasing for low index values and starts increasing for index values above 46. Note, however, that

[20] Note that the effects on the GEI are negative for low IR index values. Figure 6 in Appendix A.4 displays the IR index effects for the GEI, the money and the power domains.

[21] We cannot perform the U-test after the SUR estimation, but the lower bound value of the IR index (7) is close to theturning point (27).

the effect becomes positive only after high index value (>92), which only concerns Belgium.

Negative effects of IR are also found for the work domain both in the linear and quadratic specifications. There is evidence of a U-shaped relationship, suggesting that negative effects are smaller for countries with low and high values of the IR index. The negative effects for the work and health domains are somewhat compatible with the descriptive evidence displayed in Table 2 showing that LP countries with low IR index values perform quite well in these two domains, whereas SC countries with above-average IR index values tend to perform less well. Finally, no significant effects are again reported for the knowledge domain, but we can see a positive effect of the TU density gender gap for both specifications. The gender gap also has a positive effect on the power domain as well as the time and health domain but only in the linear specification for the latter domain.

Table 5. Estimation results - EIGE indices - random effects and seemingly unrelated regressions

	GEI		Work		Money		Knowledge		Time		Power		Health	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
RE														
IR	0.10†	-0.08	0.01	0.02	0.14†	0.06	0.02	-0.10	0.05	-0.20*	0.28†	0.01	0.02	-0.02
	(0.0)	(0.1)	(0.0)	(0.0)	(0.0)	(0.1)	(0.0)	(0.1)	(0.1)	(0.1)	(0.1)	(0.2)	(0.0)	(0.0)
IR^2	-	0.00†	-	0.00	-	0.00	-	0.00	-	0.00‡	-	0.00*	-	0.00
	-	(0.0)	-	(0.0)	-	(0.0)	-	(0.0)	-	(0.0)	-	(0.0)	-	(0.0)
ΔUD	0.02	0.02	-0.01	-0.01	0.04	0.04	0.06	0.06	0.00	0.00	-0.07	-0.07	0.01	0.02
	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.1)	(0.1)	(0.0)	(0.0)	(0.1)	(0.1)	(0.0)	(0.0)
F-test	-	0.00	-	0.43	-	0.00	-	0.26	-	0.08	-	0.00	-	0.26
U-test	-	0.22	-	-	-	-	-	0.25	-	0.06	-	-	-	0.35
Shape	-	U	-	I	-	-	-	U	-	U	-	-	-	U
Int.	-	[7;94]	-	[7;94]	-	[7;94]	-	[7;94]	-	[7;94]	-	[7;94]	-	[7;94]
>0	-	[36;94]	-	[7;94]	-	[7;94]	-	[73;94]	-	[65;94]	-	[7;94]	-	[37;94]
TP	-	18	-	170	-	-	-	36	-	32	-	-	-	18
BP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Haus.	0.12	0.54	0.12	0.15	0.39	0.69	0.07	0.04	0.21	0.58	0.37	0.74	0.07	0.11
R^2_w	0.77	0.78	0.90	0.91	0.80	0.81	0.60	0.60	0.31	0.32	0.66	0.67	0.58	0.57
R^2_b	0.86	0.86	0.67	0.67	0.86	0.86	0.69	0.71	0.58	0.63	0.69	0.70	0.59	0.61
SUR														
IR			-0.03†	-0.11‡	0.14†	0.00	0.03	0.03	0.16†	-0.14	0.26†	-0.31†	0.02†	-0.18†
			(0.0)	(0.0)	(0.0)	(0.1)	(0.0)	(0.1)	(0.0)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)
IR^2			-	0.00*	-	0.00‡	-	0.00	-	0.00‡	-	0.01†	-	0.00†
			-	(0.0)	-	(0.0)	-	(0.0)	-	(0.0)	-	(0.0)	-	(0.0)
ΔUD			0.02	0.01	-0.02	-0.03	0.12†	0.14†	0.12‡	0.15†	0.15†	0.13†	0.05†	-0.01
			(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)
F-test			-	0.00	-	0.00	-	.16	-	0.00	-	0.00	-	0.00
Shape			-	U	-	-	-	-	-	U	-	U	-	U
Int.			-	[7;94]	-	[7;94]	-	[7;94]	-	[7;94]	-	[7;94]	-	[7;94]
>0			-	>94	-	[2;94]	-	[7;94]	-	[44;94]	-	[53;94]	-	[92;94]
TP			-	69	-	-	-	-	-	22	-	27	-	46

† p<0.01, ‡ p<0.05, * p<0.1

Notes: Estimation results for the RE and SUR models. For the GEI and each of its domains, the table displays estimated coefficients for linear (1) and non-linear effects (2) of IR on GE. For the non-linear estimation, the table further shows the p-value from a joint F-test of significativity on the IR index and IR index^2 coefficients, the shape of the relationship tested and the p-value from the U test (Lind and Mehlum, 2010), the interval of IR index values in the sample (Int), the interval over which the estimated effect is positive (> 0) and the turning point (TP). No p-value from the U test is reported when the extremum lies outside the range of IR values (the relation is monotonic over the range of observed IR index values). P-values for the Breusch-Pagan (BP) and robust Hausman tests are also displayed. Clustered standard errors at the country level in parentheses for RE estimations.

Table 6. Estimation results by IR dimensions - EIGE indices - random effects

	GEI		Work		Money		Knowledge		Time		Power		Health	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
TU str.	0.18	-0.31	0.04	0.21†	0.47†	0.54‡	0.01	-0.22	-0.02	-0.90‡	0.67‡	-0.25	0.02	-0.03
	(0.1)	(0.2)	(0.0)	(0.1)	(0.1)	(0.3)	(0.1)	(0.2)	(0.2)	(0.4)	(0.3)	(0.6)	(0.0)	(0.1)
TU str.^{2}	-	0.03†	-	-0.01†	-	0.00	-	0.02	-	0.06†	-	0.06‡	-	0.00
	-	(0.0)	-	(0.0)	-	(0.0)	-	(0.0)	-	(0.0)	-	(0.0)	-	(0.0)
F-test	-	0.00	-	0.01	-	0.00	-	0.34	-	0.02	-	0.01	-	0.38
U-test	-	0.11	-	0.02	-	-	-	0.17	-	0.01	-	0.36	-	0.42
Shape	-	U	-	I	-	-	-	U	-	U	-	U	-	U
Int.	-	[0;17]	-	[0;17]	-	[0;17]	-	[0;17]	-	[0;17]	-	[0;17]	-	[0;17]
>0	-	[10;17]	-	[0;17]	-	[0;17]	-	[14;17]	-	[16;17]	-	[4;17]	-	[7;17]
TP	-	5	-	9	-	-	-	7	-	8	-	2	-	4
Barg.	0.08*	-0.11	0.01	-0.09	0.11‡	-0.05	-0.03	0.11	-0.03	-0.45	0.31†	0.12	0.03	-0.02
	(0.0)	(0.2)	(0.0)	(0.1)	(0.0)	(0.2)	(0.0)	(0.2)	(0.1)	(0.3)	(0.1)	(0.4)	(0.0)	(0.1)
Barg.^{2}	-	0.01	-	0.00‡	-	0.00	-	-0.00	-	0.01*	-	0.01	-	0.00
	-	(0.0)	-	(0.0)	-	(0.0)	-	(0.0)	-	(0.0)	-	(0.0)	-	(0.0)
F-test	-	0.03	-	0.04	-	0.02	-	0.27	-	0.17	-	0.01	-	0.23
U-test	-	0.24	-	0.06	-	0.41	-	0.25	-	0.06	-	-	-	-
Shape	-	U	-	U	-	U	-	I	-	U	-	-	-	U
Int.	-	[1;33]	-	[1;33]	-	[1;33]	-	[1;33]	-	[1;33]	-	[1;33]	-	[1;33]
>0	-	[18;33]	-	[28;33]	-	[10;33]	-	[1;24]	-	>33	-	[1;33]	-	[1;33]
TP	-	9	-	14	-	5	-	12	-	17	-	-	-	28
Invol.	0.14†	-0.11	0.00	0.04	0.19†	0.17	0.09	-0.23‡	0.16	0.06	0.26	-0.39	0.00	-0.11‡
	(0.0)	(0.1)	(0.0)	(0.0)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.3)	(0.2)	(0.3)	(0.0)	(0.0)
Invol.^{2}	-	0.01‡	-	-0.00	-	0.00	-	0.01†	-	0.00	-	0.03*	-	0.01‡
	-	(0.0)	-	(0.0)	-	(0.0)	-	(0.0)	-	(0.0)	-	(0.0)	-	(0.0)
F-test	-	0.00	-	0.67	-	0.01	-	0.00	-	0.27	-	0.11	-	0.05
U-test	-	0.13	-	0.21	-	-	-	0.02	-	-	-	0.08	-	0.01
Shape	-	U	-	I	-	-	-	U	-	U	-	U	-	U
Int.	-	[0;31]	-	[0;31]	-	[0;31]	-	[0;31]	-	[0;31]	-	[0;31]	-	[0;31]
>0	-	[9;31]	-	[0;24]	-	[0;31]	-	[16;31]	-	[0;31]	-	[13;31]	-	[21;31]
TP	-	5	-	12	-	-	-	8	-	7	-	7	-	11
Oth.	0.79†	0.44	0.10	0.17	0.56‡	0.87*	0.08	0.44	0.86‡	1.54*	1.73‡	0.34	0.22*	0.28
	(0.2)	(0.7)	(0.1)	(0.2)	(0.2)	(0.5)	(0.3)	(0.5)	(0.3)	(0.9)	(0.7)	(1.7)	(0.1)	(0.3)
Oth.^{2}	-	0.03	-	-0.01	-	-0.03	-	-0.03	-	-0.06	-	0.12	-	-0.01
	-	(0.1)	-	(0.0)	-	(0.0)	-	(0.1)	-	(0.1)	-	(0.1)	-	(0.0)
F-test	-	0.00	-	0.28	-	0.01	-	0.71	-	0.03	-	0.00	-	0.22
U-test	-	-	-	-	-	-	-	0.36	-	-	-	-	-	-
Shape	-	-	-	I	-	I	-	I	-	I	-	-	-	I
Int.	-	[0;11]	-	[0;11]	-	[0;11]	-	[0;11]	-	[0;11]	-	[0;11]	-	[0;11]
>0	-	[0;11]	-	[0;11]	-	[0;11]	-	[0;11]	-	[0;11]	-	[0;11]	-	[0;11]
TP	-	-	-	12	-	15	-	7	-	13	-	-	-	21

†p<0.01, ‡ p<0.05, * p<0.1

Notes: Estimation results by IR dimension and for the RE model. For the GEI and each of its domains, the table displays estimated coefficients for linear (1) and non-linear effects (2) of IR on GE. For the non-linear estimation, the table further shows the p-value from a joint F-test of significativity on the IR index and IR index^2 coefficients, the shape of the relationship tested and the p-value from the U test (Lind and Mehlum, 2010), the interval of IR index values in the sample (Int), the interval over which the estimated effect is positive (> 0) and the turning point (TP). No p-value from the U test is reported when the extremum lies outside the range of IR values (the relation is monotonic over the range of observed IR index values). Clustered standard errors at the country level in parentheses.

The results from both models indicate that countries with strong social partners, social dialogue, and collective bargaining tend to perform better in terms of GE measured through the GEI. Moreover, the positive effects seem to be increasing in these characteristics, implying that the effects are greater, the stronger social dialogue and social partners are. The positive association seems to originate mostly from the money and power domains. The fact that no consistent effects are found for the time, health and knowledge domains could be explained by these being three domains on which IR and social partners have only a limited and indirect influence[22]. For the work domain, the lack of significant results could indicate that the aspects covered by this domain (e.g. 'the ability to take an hour or two off during working hours to take care of personal or family matters' in Table 1) are perhaps not considered enough by social partners when negotiating CA. Yet, this domain is also likely to be correlated with labour market performances (e.g. the inclusion of the FTE employment rate and the good scores obtained by LP and Mixed countries). However, the relationship between labour market performance and IR is not straightforward (Calmfors and Driffill, 1988; Nickell, 1997).

The results in Table 6 allow a closer look at whether one (or more) IR dimensions used to build the index (Table 3 and Table 4) drives the results[23]. The control variables are the same as the ones used for the RE and SUR estimation. From Table 6, we can see that all dimensions tend to be positively associated with the GEI. The *involvement* and *other* dimensions, in particular, have positive and significant effects in both the linear and non-linear specifications, whereas effects for *TU strength* and *bargaining* are significant only in the quadratic specification. As noted for the RE and SUR models, the F-tests tend to support the quadratic specification without supporting U-shaped effects. As a result, the evidence suggest that the various IR dimensions have increasing effects on the GEI, as found for the overall IR index. Similar conclusions can also be reached for the money and power domains as all IR dimensions appear to have significant and non-linear effects on these two domains.

With regard to the remaining domains, there are few significant effects found for the *involvement* and *other* dimensions for, respectively, the knowledge/health and time domains. The dimension *TU strength* also has a significant (non-linear) effect on the time domain, but this effect is negative for most of the dimension's values. Furthermore, *TU strength* and *bargaining* are the only dimensions with a significant effect on the work domain. The effect of *bargaining* could be U-shaped but is only positive for high values of the dimension, above 28[24]. However, the estimated effect for the *TU strength* seems to follow an inverted U shape, implying that the positive effect is smaller when TU are very weak or very strong (and conversely, the effect is greater for intermediate TU strength). This effect mirrors the bargaining effect and could explain the negative/ non-significant effect of the (aggregate) IR index on the work domain since both dimensions tend to be correlated.

Overall, the results from the analysis of EIGE indices at country level are indicative of a positive relationship between the GEI and IR characterised by social dialogue at national and firm level, strong social partners, and collective bargaining. The effect appears to go through the positive association between IR with such characteristics, and the money and power domains. The effects of IR on the former domain are in line with evidence on the positive effects of CB on the GPG (Blau and Kahn, 2017). For the power domain, the effect of IR could be explained by the fact that better representation of women in decisional positions is correlated with a greater role given to social dialogue and to workers/TU at the firm level through information, consultation and even co-determination rights (Eurofound, 2018). Results for other domains (knowledge, time,

[22] For instance, the knowledge domain includes many indicators related to the national education system, except perhaps for the indicator on training (Table 1). Likewise, for the time and health domains, although one could argue, for instance, that better work-life balance could contribute, indirectly, to improving some of the indicators used to construct these two domains.

[23] The dimension *participation* is not included in the results since it is only built from two variables with the variable on the existence of a bipartite council being the main contributor to this dimension's index values. See Ounnas (2022) for more details.

[24] We can link these observations with our previous point on the Work domain being correlated, to some extent, with labour market performance. For instance, Calmfors and Driffill (1988) have argued for a U-shaped effect of bargaining on economic performance, whereas Soskice (1990) reports a strictly increasing effects. The results in Table 6 would tend to support the latter result. It should be noted that both analyses focus on different aspects of bargaining (i.e. centralisation and coordination), which are both included under the *bargaining* dimension in the IR index.

etc) are more inconsistent but IR may have only indirect and limited effects on the indicators used to construct these domains.

3 The gender pay gap and Industrial Relations in European Member States

In this section, we take a closer look at the GPG and its relation with IR. We use data from the SES to compute raw and adjusted GPG and then investigate the links between these two measures of gender pay differences and our IR index. Sections 3.1 and 3.2 present the data and methodology. The results are displayed and discussed in Section 3.3.

3.1 Data: Structure of Earnings Survey

The source of data for wages is the anonymised SES for the years 2006, 2010, 2014 and 2018. The SES is a representative sample of employees[25] offering detailed information on annual, monthly and gross hourly earnings including overtime work, bonuses, tips and other gratifications expressed in nominal national currencies. The SES sample is usually drawn from a two-stage stratified sample. In the first stage, local units at the NUTS × Company_Size × NACE are drawn. In the second stage, a sample of employees is selected within the local units, stratifying the sample at the level of occupations, type of contract or sex. Data on earning is then retrieved from administrative documents (e.g. accounting books) for a specific reference month[26] together with information on the firm and its employees. These include, for instance, the size and private/public ownership of the company or the worker's age, tenure at the firm, and education level. The inclusion in the sample of small firms with one to nine employees and/or operating in the public administration sector (NACE O) is optional and left to the discretion of Member States.

Thus, the SES presents numerous advantages to study the GPG. It provides a harmonised framework for Member States to collect and disseminate detailed information of employees' earnings, although national specificities in bonuses/gratifications and other characteristics cannot be ruled out. Moreover, the possibility it offers to work with hourly wages, its large and representative sample size and the information collected on firms, constitute additional reasons to analyse gender differences in earnings using this dataset.

There are nevertheless limitations in working with the SES. The main one comes from the anonymisation procedure, which suppresses or aggregates variables to ensure that no companies/employees can be identified from information available in the sample. The procedure affects the three variables used to sample local units (NUTS, Size and NACE). The NUTS variable is often missing or aggregated, the company size is provided in two or three categories (< 50 and ≥ 50 or 1-49, 50-249 and ≥ 250) and sometimes provided in other different categories for firms facing an anonymisation risk. The firm identification key, which could be very useful to control for firm characteristics, is also dropped. Variables such as the ownership or the occupation are set to missing for firms/workers in sensitive cases. Moreover, if a variable used to stratify the sample leads to a cell with three or less employees, then variables on earnings are averaged for this specific cell. Earnings (and tenure) are top-coded with a level that can vary depending on the anonymisation risk (in the case of Germany, for example).

The anonymisation procedure is, for the most part, country specific and can change throughout the years, which complicates the creation of consistent variables across countries and years. The existing detailed documentation on the procedure can help to create consistent variables. To do so, we start by dropping Cyprus, Luxembourg and Malta from the sample given that important variables (e.g. the company size) are not available for these countries. Lithuania and Portugal in 2018 are also dropped for issues with important variables, respectively ownership and tenure. We then aggregate some categories for variables such as the size of the company (two categories only: < 50 and ≥ 50) or the NACE classification (e.g. industry as the

[25] This excludes self-employed, family workers or any other type of workers who do not have an employment contract.

[26] This month is usually October given that it is the month with the lowest rate of absence from work throughout the year.

sum of the mining (B) to construction (F) sectors). The variable on tenure is categorised (four categories from < 1 year to ≥ 15 years) to account for the fact that the Netherlands provides this variable in this manner and for the top-coding applied by some countries (e.g. Belgium, Portugal). For variables only affected partially in some countries by the anonymisation procedure - for instance, the company size variable in Italy or Spain - we do not drop these anonymised observations from the sample as their number can be significant and we simply consider the missing values as a distinct category for this variable and this country[27]. Note also that the SES provides a variable on whether the employee is covered by a CA. This variable could be very relevant for our work, but it is quite often coded differently across countries. It can be affected by the anonymisation procedure and can show very little variation within countries as all observations in the sample are often covered by a CA (e.g. in Finland or Italy). Thus, generating a consistent variable across countries is slightly complicated and we do not consider this variable in our analysis.

We drop observations on employees in the public administration sector (when available), but it is not possible to ensure the inclusion or exclusion of firms with 1 to 9 employees in all the country samples since the company size variable only informs on a 1 to 49 size. Therefore, the data will differ between countries on this aspect[28]. We further restrict the sample to employees aged 20 or more, drop apprentices, armed forces and employees in the skilled agricultural major occupation group. These employees represent a negligible share of the sample. Moreover, we follow Ciminelli et al. (2021) and remove negative values (very marginal number), observations with monthly variable earnings from overtime/shift work greater than total monthly earnings, and trim the hourly wage distribution at the 1st and 99th percentiles.

Datasets for Austria and Ireland are not available, and some countries started providing data for scientific use to Eurostat after 2006 (e.g. Croatia in 2010, Denmark and Slovenia in 2014). As a further check on the data, we compute monthly wages and employment by 1-digit NACE sectors and compare the values to those reported on Eurostat's website[29]. In very few cases, mean wages can differ quite substantially from those published by Eurostat and we therefore drop these countries. It seems that issues are often related to countries providing data for the first time (e.g. Denmark in 2014 or Croatia in 2010). Two exceptions are Belgium in 2006 and Germany. For the latter, the slight differences could be explained by the fact that Germany provides a sub-sample (around 80 % of the original sample) for scientific file usage.

Our main variable of interest, *w*, is the hourly wage, which includes overtime and special payments for shift work. This is the main variable on earnings provided in the SES[30]. Table 7 displays average values for *w* and the GPG defined as:

$$\Delta w = \frac{w^{Men} - w^{Women}}{w^{Men}} \times 100, \quad (3)$$

whereas Table 8 and Table 9 display descriptive statistics on the SES sample for the main variables used in the analysis.

Although the numbers differ slightly from those reported by Eurostat, this table reveals usual observations, such as the substantial heterogeneity in the unadjusted GPG across EU countries (Leythienne and Ronkowski, 2018). The GPG tends to be smaller in Belgium, Italy, Poland and Romania and greater in Czechia, Estonia, Germany, Finland and Slovakia.

These differences may seem surprising, but they can be partly explained by differences in firms and employees'

[27] This implies, for instance, that the variable company size will have three categories (< 50 and ≥ 50, and other/missing) for Italy and Spain but two categories for countries unaffected by the anonymisation procedure.

[28] It is possible to identify countries that include small firms using Eurostat's published results. These are BG, CY, CZ, EE, ES, FI (only in 2014), HU, LT, LV, NL, PL, SI (from 2014) and SK. Evidence for DE suggests that small firms are included in the sample.

[29] These are [earn_sesYY_02] and [earn_sesYY_13] for YY equal to 06, 10, 14 and 18.

[30] It is also possible to compute monthly wages including annual bonuses (Ciminelli et al., 2021), or alternatively, an hourly wage excluding overtime and shift work pay (but not hours for this special work) can also be computed from the SES.

characteristics. For instance, Table 8 and Table 9 show that women are much more educated than men in Italy, Poland and Romania. More precisely, 28 % of women in Italy hold the highest level of education as opposed to 16 % of men with the same figures being 44 % - 27 % and 36 % - 24 % in Poland and Romania. It is likely that this higher level of education raises women's wages and that if women had men's education level, the GPG would increase. The opposite holds for Germany, where the share of highly educated men is greater than the share of women. As such, this difference is likely to inflate the GPG, which would be lower if women had men's level of education. Moreover, it should be mentioned that the smaller GPG in Italy, Poland and Romania also reflect self-selection into the labour force as women's labour force participation rates are much below the EU average in these countries. Olivetti and Petrongolo (2008) argue that women, who would earn low wages, tend to stay outside of the labour force in these countries, which lowers the measured GPG. They propose a correction for this selection bias based on the imputation of wages to inactive individuals, which results in much higher GPG for these countries.

From Table 7, we can further note that the GPG decreased in most EU countries between 2006 and 2018 except in a few cases such as France, Latvia or Poland. The recent evolution is, however, more mitigated with a GPG stagnating or even increasing in many countries between 2014 and 2018.

Table 7. Mean hourly wages and gender pay gaps - 2006-2018

	2006		2010		2014		2018	
	w	Δw	w	Δw	w	Δw	w	Δw
Belgium	-	-	18.6	7.6	19.6	4.9	20.1	5.6
Bulgaria	1.0	10.0	1.8	10.4	2.1	9.6	3.0	10.9
Croatia	-	-	-	-	5.6	5.8	6.2	9.0
Czechia	4.0	18.4	4.9	15.0	4.9	16.9	6.6	15.2
Denmark	-	-	-	-	-	-	30.4	12.6
Estonia	3.4	26.2	4.6	21.1	5.3	21.1	7.2	16.8
Finland	15.3	18.9	17.8	17.7	19.2	15.7	19.8	15.0
France	15.2	11.9	15.9	12.4	17.0	12.4	17.6	13.0
Germany	16.8	19.3	17.0	19.9	16.8	20.5	18.7	18.5
Greece	9.2	18.3	10.7	12.1	9.2	9.8	8.4	6.2
Hungary	3.2	8.3	3.9	9.5	4.2	6.2	5.2	8.8
Italy	13.2	2.2	14.2	1.9	15.1	2.0	15.2	1.3
Latvia	2.3	9.6	3.4	8.3	4.0	12.7	6.0	14.9
Lithuania	2.5	11.9	3.4	7.5	3.6	6.8	-	-
Netherlands	14.6	16.9	17.1	15.3	17.9	15.0	19.3	13.6
Poland	3.9	2.1	4.9	-0.3	5.6	4.4	6.3	5.9
Portugal	6.7	4.0	7.3	7.5	7.1	9.6	-	-
Romania	1.8	6.2	2.5	7.5	2.6	2.4	4.9	1.2
Slovakia	2.9	20.9	4.5	15.4	5.1	15.4	6.4	15.9
Slovenia	-	-	-	-	8.2	1.4	8.9	4.9
Spain	9.1	13.8	10.4	13.5	10.8	12.1	11.2	10.6
Sweden	15.8	13.7	17.5	12.8	20.3	11.6	20.1	9.9

Source: SES based on author's own computations.

Table 8. Structure of Earnings Survey - descriptive statistics – women

	Age				Tenure			Education		Size	
	20-29	30-39	40-49	50-59	1Y-5Y	6Y-14Y	GT 15Y	1	3	LT50	GT50
BE	18.4	27.7	28.6	22.7	33.5	28.3	26.2	19.9	39.9	19.3	80.5
BG	15.0	24.7	27.9	25.6	42.7	23.4	12.8	6.7	39.0	44.5	54.8
CZ	18.0	24.7	29.0	24.0	40.1	27.9	16.3	10.3	18.8	34.8	65.2
DE	15.8	20.6	27.7	27.0	38.2	27.7	25.9	13.2	16.3	34.1	65.9
DK	18.1	21.9	25.4	24.8	32.0	28.0	16.9	8.9	51.2	17.1	82.9
EE	14.5	20.5	25.2	25.7	39.0	29.1	16.9	6.6	45.7	36.7	63.3
EL	15.9	33.0	32.3	17.1	29.2	30.4	21.5	12.7	41.5	31.4	68.6
ES	18.1	32.3	28.0	17.5	34.7	29.1	17.5	39.9	37.5	37.1	50.2
FI	15.0	22.3	26.9	28.1	32.2	27.9	25.5	8.9	50.1	15.3	84.7
FR	15.5	27.3	29.0	23.6	31.2	30.7	30.6	17.5	43.9	19.4	80.6
HR	12.2	27.7	29.3	25.9	30.8	28.8	27.5	10.5	41.2	27.9	72.1
HU	15.0	24.9	29.3	26.2	38.1	26.2	18.0	14.0	30.1	36.5	63.5
IT	9.8	26.2	33.5	25.9	29.9	32.5	27.9	26.4	27.7	21.3	78.6
LT	15.8	22.8	29.7	24.3	35.8	26.9	19.5	3.3	52.9	36.5	63.5
LV	15.2	21.4	26.6	25.3	42.0	27.1	13.5	6.0	44.5	36.6	52.9
NL	24.0	23.8	25.4	21.3	35.2	38.3	18.4	19.1	35.5	27.6	72.4
PL	16.8	28.4	30.2	23.0	34.4	29.0	26.6	9.4	43.9	31.8	68.2
PT	18.8	32.6	28.2	17.1	33.2	32.7	23.3	46.9	30.8	26.3	73.7
RO	15.4	29.3	32.3	21.0	41.2	30.0	18.9	7.8	36.1	16.7	83.3
SE	16.6	22.1	26.6	24.6	36.6	29.2	26.3	7.4	47.6	13.1	86.9
SI	11.3	28.3	31.9	26.6	30.0	29.4	26.6	9.0	42.0	30.8	69.2
SK	14.9	24.6	29.6	26.4	37.5	30.8	18.8	9.3	28.2	29.4	70.6
	Industry				Occupation			Own		Contract	
	B-F	G-J	K-N	Q	1-3	5-9	4-7-8	Pub	Priv	PT	temp
BE	13.4	23.3	21.8	27.9	38.7	35.3	26.0	13.5	75.8	40.2	7.2
BG	29.5	32.0	11.1	10.1	34.9	36.2	28.8	25.9	65.0	10.0	8.7
CZ	29.0	27.4	14.1	13.4	42.1	27.5	30.3	27.8	72.2	8.0	21.8
DE	15.4	25.9	19.3	23.5	37.9	34.4	27.1	13.8	70.6	59.4	12.8
DK	7.9	17.6	18.0	40.8	51.8	34.3	13.9	52.2	47.8	28.2	4.5
EE	20.8	28.3	13.9	13.3	46.6	31.9	21.5	33.4	65.4	20.3	5.5
EL	13.3	40.1	13.9	12.1	36.4	33.3	25.7	27.5	72.5	14.1	16.8
ES	11.8	35.8	21.7	16.8	33.4	43.3	23.3	13.3	86.7	32.9	22.7
FI	11.2	22.7	14.1	36.0	46.5	37.4	16.1	48.3	51.7	17.2	14.5
FR	12.1	23.6	20.6	28.0	47.0	29.3	23.7	27.7	72.3	29.6	10.0
HR	18.2	29.3	11.1	14.2	43.1	34.0	23.0	46.7	53.3	5.4	15.7
HU	21.1	27.8	13.8	14.4	47.3	26.0	26.7	36.5	63.5	14.7	5.8
IT	19.2	23.3	17.1	17.4	39.5	23.6	37.0	36.7	63.3	25.5	10.1
LT	20.3	29.7	10.9	14.6	56.0	26.9	17.2	39.5	60.5	20.6	5.1
LV	15.3	33.8	13.6	11.1	51.0	32.4	16.6	38.9	61.1	29.6	4.8
NL	6.7	23.6	21.8	33.2	45.0	34.9	18.2	42.5	57.5	76.0	22.0
PL	22.2	24.5	13.0	14.3	53.8	24.9	21.3	43.0	57.0	10.9	27.3
PT	21.6	23.4	15.1	19.0	33.0	38.1	28.9	25.0	75.0	7.5	22.9
RO	36.7	23.6	10.4	12.5	41.5	29.1	29.4	32.8	67.2	3.4	2.7
SE	8.8	17.3	11.9	43.2	46.9	38.9	14.1	55.2	44.8	38.9	4.6
SI	21.4	28.3	15.2	14.8	49.2	31.5	19.3	38.8	61.2	5.4	20.9
SK	26.2	26.6	12.9	13.4	46.6	25.7	27.8	31.2	68.8	10.1	15.6

Source: SES based on author's own computations.

Notes: Frequency of observations computed using SES sampling weights. For education, 1 stands for below lower secondary and 3 for tertiary education, PT for part-time, temp. for temporary contract. Major ISCO occupations are aggregated into three groups: 1, 2 and 3 (managers, …), 5 and 9 (services and elementary) and 4-7-8 (clerical support, craft and trade and machine-operator). 1-digit NACE sectors are aggregated as displayed in the header (e.g. B- mining to F-construction). One category is left out for each variable except for occupations. Blue (red) cells inform on high (low) percentages across countries (per column).

Table 9. Structure of Earnings Survey - descriptive statistics - men

	Age				Tenure			Education		Size	
	20-29	30-39	40-49	50-59	1Y-5Y	6Y-14Y	GT-15Y	1	3	LT50	GT50
BE	17.7	27.3	28.6	23.4	33.5	28.4	27.4	22.7	36.0	22.3	77.3
BG	17.6	25.2	24.2	22.7	45.5	21.2	9.2	8.3	24.9	41.2	58.1
CZ	20.2	27.5	23.9	21.0	38.6	30.0	15.9	7.9	16.8	34.3	65.7
DE	15.8	23.7	27.2	24.3	36.1	27.2	27.8	10.7	20.7	30.9	69.1
DK	18.6	23.3	24.2	22.8	34.8	23.8	14.3	14.3	39.4	26.8	73.2
EE	19.0	25.2	22.8	21.1	41.5	28.5	12.3	11.7	32.3	46.4	53.6
EL	13.4	31.5	30.9	20.9	29.8	28.5	22.9	18.8	36.2	30.4	69.6
ES	16.5	31.2	28.1	19.0	33.0	26.3	20.5	52.5	28.7	45.6	46.6
FI	16.8	26.7	26.0	24.2	32.1	28.4	26.6	13.3	38.5	23.8	76.2
FR	14.9	27.3	29.0	24.2	30.8	30.8	31.5	20.5	35.1	24.3	75.7
HR	15.3	30.0	24.8	23.5	34.7	28.0	22.6	10.8	25.8	32.1	67.9
HU	16.9	29.2	26.0	21.7	40.5	26.2	14.1	11.8	20.7	42.0	58.0
IT	10.6	27.3	32.4	24.9	30.6	31.2	28.2	41.0	16.0	30.7	69.2
LT	20.8	23.9	25.5	21.5	41.5	24.2	9.6	5.7	39.4	42.6	57.4
LV	19.6	24.6	23.6	21.2	45.7	24.4	8.2	10.0	31.3	46.6	47.2
NL	21.7	23.8	24.8	21.8	33.5	35.5	22.5	22.5	33.2	33.9	66.1
PL	20.0	29.5	24.5	21.0	38.4	30.1	21.7	15.9	26.9	25.5	74.5
PT	19.4	31.1	26.8	18.7	35.0	29.7	23.6	60.4	18.5	34.4	65.6
RO	15.7	28.0	29.5	22.6	44.7	26.5	16.5	8.3	24.5	20.3	79.7
SE	18.2	24.8	25.5	22.5	43.1	31.3	17.6	11.9	33.1	25.1	74.9
SI	15.3	30.1	28.1	23.3	35.8	26.9	20.2	10.7	24.0	43.7	56.3
SK	17.4	26.2	25.0	24.9	38.3	31.0	16.9	6.9	22.6	31.0	69.0
	Industry				Occupation			Own		Contract	
	B-F	G-J	K-N	Q	1-3	5-9	4-7-8	Pub	Priv	PT	temp
BE	36.3	30.1	16.7	9.2	38.2	20.8	41.0	7.9	79.0	10.8	5.9
BG	44.7	33.5	12.3	2.8	25.4	29.7	44.9	14.9	73.8	8.2	9.6
CZ	51.8	27.4	12.4	2.6	34.8	13.3	51.8	12.8	87.2	3.0	17.7
DE	42.8	27.3	17.1	5.6	34.1	17.3	47.0	8.0	67.5	18.1	10.4
DK	27.8	29.9	21.0	10.0	45.1	25.5	29.4	21.3	78.7	24.4	3.7
EE	45.2	30.6	12.8	2.5	38.9	15.1	46.0	15.6	83.4	10.0	5.0
EL	29.9	39.7	10.8	5.4	31.4	26.1	36.1	21.7	78.3	8.0	16.0
ES	38.8	35.4	14.5	4.3	29.0	25.1	45.9	7.2	92.8	11.9	23.8
FI	43.9	27.7	14.5	4.7	44.9	16.3	38.8	20.3	79.7	7.2	9.9
FR	34.6	32.5	17.6	7.2	45.5	16.0	38.5	15.4	84.6	8.7	6.0
HR	46.4	29.0	10.3	4.0	33.4	23.0	43.6	30.7	69.3	2.7	15.3
HU	42.7	33.3	11.9	3.7	32.8	18.4	48.8	20.4	79.6	9.6	4.9
IT	44.8	28.0	14.1	6.0	28.8	19.6	51.5	17.9	82.1	6.2	8.5
LT	41.8	34.4	10.3	3.5	38.4	14.3	47.4	19.3	80.7	15.0	5.2
LV	37.4	36.5	14.4	2.7	38.7	18.8	42.6	20.0	80.0	26.4	5.9
NL	26.8	32.3	26.4	5.8	45.6	17.9	34.6	14.0	86.0	27.9	21.5
PL	52.6	26.0	10.1	2.8	34.4	13.5	52.0	23.9	76.1	5.8	28.2
PT	42.2	29.2	16.1	4.3	30.5	22.0	47.5	12.5	87.5	3.1	25.2
RO	50.2	27.5	11.9	3.1	28.2	23.5	48.3	20.5	79.5	2.5	2.2
SE	37.1	27.3	15.0	11.9	44.6	17.5	37.9	22.5	77.5	11.0	3.6
SI	49.2	28.9	13.0	3.1	34.7	18.3	47.1	18.9	81.1	2.2	24.0
SK	47.9	28.5	12.5	3.4	34.9	14.1	51.0	16.0	84.0	4.6	15.2

Source: SES based on author's own computations.

Notes: See notes at the bottom of Table 8 for information on each column. One category is left out for each variable except for occupations. Blue (red) cells inform on high (low) percentages across countries (per column).

Table 8 and Table 9 provide additional descriptive statistics on women and men[31] in the sample, and for the variables used to decompose the GPG in section 3.3. The statistics are percentages computed using sample weights and give information on the distribution of the various characteristics across countries. For instance, Table 8 shows that 9.8 % of women employees in Italy are aged between 20 and 29 (over the four years between 2006 to 2018). The same number rises to 24 % in the Netherlands. By comparing these percentages across gender, these tables allow us to anticipate some of the decomposition results obtained in section 3.3. As an example, 76 % of Dutch women employees work part-time whereas only 33.9 % of men do so. Part-time work can offer less favourable (pay) conditions compared to full-time positions, everything else being equal. If this is indeed the case, we can expect that the higher prevalence of part-time work among women in the Netherlands contributes substantially to the GPG in this country.

Based on Table 8 and Table 9, a first interesting remark concerns occupational segregation. Major ISCO occupations have been aggregated into three broad groups and we can see that the share of women working in major occupations 1 to 3 (managers, professionals and technicians) is often much greater than the share for men (e.g. in Denmark, Finland or Lithuania). This is likely to lower the GPG for these countries given that these white-collar occupations tend to be more paid on average. The share of women working in services and elementary occupations (5-9) tend to also be greater than the same share for men who are mostly working in clerical support, craft and trade, and machine-operator occupations (4-7-8). Furthermore, we note the usual pattern of sectoral segregation with men working mostly in the industry sectors, whereas women are employed more in the health or education sectors[32]. Finally, women tend to work more in larger and publicly owned companies in most EU countries.

3.2 Methodology: gender pay gap decomposition

As touched upon in the previous section, the GPG displayed in Table 7 includes earnings differences coming from the characteristics of men and women. Thus, it is worth adjusting the GPG for these observed differences to work with an adjusted measure of pay disparities. The Oaxaca-Blinder (OB) decomposition (Oaxaca, 1973; Blinder, 1973) is one of the most widely used method to decompose (wage) gaps between two groups, into an explained component, due to observed characteristics, and an unexplained (or adjusted) component (Fortin et al., 2011). The method can be applied to gaps in mean wages through two OLS regressions on men and women's log hourly earnings.

However, the OB decomposition can suffer from substantial bias originating from endogeneity issues related to omitted variables, self-selection, and so on (Kunze, 2008; Huber, 2015). Imputations (Olivetti and Petrongolo, 2008) or Heckman-type correction methods (Goraus et al., 2017) have been used to address selection issues in the OB framework. However, these solutions require a sample of the total working age population, whereas the SES is restricted to employees. Furthermore, the OB decomposition implicitly accounts for overlapping support issues (Fortin et al., 2011) using estimated parameters and predicted values, which could have a significant effect on the adjusted GPG (Strittmatter and Wunsch, 2021). Finally, the regression on log hourly wages generate a discrepancy between the gap decomposed (based on geometric means) and the standard measure of the GPG, (3), based on arithmetic means (Kaiser, 2016).

For these reasons, we also decompose the GPG using other popular methods. One of these has been proposed by Juhn et al. (1993) and is an extension to the OB decomposition, which recognises that residuals from the log wage equations contain information on the returns to unobservable characteristics. Under some assumptions, women residuals can be imputed based on the male wage equations providing an additional component to decompose the earning gap. This method has been used in cross country GPG analysis by Simón (2012), for example.

[31] Table 18 in Appendix A.5 displays descriptive statistics for the entire sample.

[32] This last sector is obtained as a residual in Table 8 and Table 9 and aggregates 1-digit NACE sectors P to S.

Alternatively, Fortin et al. (2011) point-out that the unexplained component in the OB decomposition can be interpreted as the treatment effect (on the treated) estimated in the policy evaluation literature. Some methods based on matching or propensity score/reweighting have therefore been proposed (Fortin et al., 2011; Kaiser, 2016; Meara et al., 2020). We use the matching method proposed by Ñopo (2008), which exactly match men and women along a set of chosen characteristics. This method ensures that the adjusted gap is computed on the common support, and Ñopo (2008) shows that in addition to the explained/unexplained components, two components are included in the decomposition for men and women outside the common support. This matching method is non-parametric, and we can directly decompose average pay gaps as they are published in official statistics without log transformation. Furthermore, as Fortin et al. (2011) argue, identification of the treatment effect (the adjusted pay gap) relies primarily on the conditional independence assumption, which is weaker than the exogeneity assumption required for non-biased OLS estimates. As such, matching methods can provide a good estimate of the adjusted component when the interest is in the aggregate and not the detailed decomposition (Fortin et al., 2011).

We use the same set of variables to compute unexplained GPGs from the OB and Ñopo methods. These are age, tenure (as proxies for experience), the education level, occupation, full-time status and contract type, as well as the size, ownership and sector of the firm. These variables are all categorical. We decompose the GPG by country and year, which leads to an unbalanced panel of country with 78 adjusted GPGs over four years (2006 to 2018)[33]. We then apply a similar strategy to section 2.2 for EIGE indices. We estimate pooled OLS, random and fixed effects models for adjusted GPGs controlling for GDP per capita, labour force participation and social expenditures in the family unit (see section 2.1.3):

$$\Delta\overline{w}_{i,t} = \mu + \gamma_1 \Delta UD_{i,t} + \gamma_2 IR_{i,t} + \beta X_{i,t} + \eta_t + \alpha_i + \varepsilon_{i,t}, \quad (4)$$

where $\Delta\overline{w}_{i,t}$ is the unexplained GPG for country *i* at time t. The specification includes year indicator variables, η_t, and a country-specific component, α_i. As in section 2.2, we test for non-linear effects of the IR index, and estimate (4) separately for the five IR dimensions (*TU strength*, *bargaining*, etc).

Given our interest on the aggregate decomposition, matching is our preferred method to decompose the GPG. Note, however, that whichever methods used, gender is not a standard treatment as assignment into a job training programme could be. As explained by Huber (2015), gender is determined at birth and is likely to influence key variables which are then used as exogenous variables in the decomposition (e.g. education).Thus, as in section 2.2, some care should be taken in interpreting the results.

3.3 Results

This section starts with a brief discussion on the OB and Ñopo's decomposition results. Estimation results on the links between IR and adjusted GPGs follow.

3.3.1 Adjusted and unadjusted gender pay gap

Table 10 presents the GPG and the adjusted component for the years 2006 to 2018. Tables in Appendix A.6 display more detailed results on the decompositions. Before taking a closer look at the results, it is worth mentioning that the results in Table 10 are, for the most part, consistent with Leythienne and Ronkowski (2018) who also decompose the GPG for EU countries using the 2014 SES. Moreover, decomposition results tend to be similar whether computed using the OB method or matching à la Ñopo.

Most countries can be separated into two main groups. The first includes countries for which the GPG tends to decrease when adjusted for observed characteristics. The decrease is substantial, both in absolute and relative terms, for Belgium, Denmark, Germany, Finland and Sweden. This indicates that on average, and compared to men, women tend to 'possess' less of the characteristics rewarded in the labour market (e.g.

[33] As explained in section 3.1 (see also footnote 27), few countries can have an additional category for specific variables affected by anonymisation (e.g. size for Spain and Italy). This could affect the decomposition, but the results displayed in Table 10 do not seem to indicate any obvious difference between countries affected or not by anonymisation.

they work less on full-time contracts, see section 3.1)[34].

Table 10. Oaxaca-Blinder and Ñopo matching decomposition of the gender pay gap

	OB decomposition								Ñopo matching							
	2006		2010		2014		2018		2006		2010		2014		2018	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
BE	-	-	8.0	6.3	4.6	2.2	6.6	0.3	-	-	7.6	5.7	4.9	1.7	5.6	0.7
BG	6.9	9.6	7.8	7.8	5.8	7.9	6.8	7.8	10.0	13.8	10.4	11.9	9.6	13.1	10.9	13.0
CZ	19.1	18.1	14.8	13.1	16.3	13.3	14.5	10.8	18.4	16.4	15.0	14.6	16.9	15.6	15.2	13.3
DE	19.9	14.5	20.3	8.0	20.4	5.1	17.8	4.6	19.3	11.3	19.9	8.2	20.5	6.3	18.5	5.2
DK	-	-	-	-	-	-	12.2	8.4	-	-	-	-	-	-	12.6	8.7
EE	29.0	23.5	22.2	17.8	21.5	17.1	16.9	14.5	26.2	22.1	21.1	18.5	21.1	19.7	16.8	17.6
EL	18.0	11.2	11.3	8.1	8.7	6.6	4.9	7.5	18.3	7.9	12.1	6.6	9.8	5.8	6.2	9.0
ES	15.1	15.8	14.8	12.7	12.8	10.6	11.4	11.6	13.8	13.5	13.5	11.4	12.1	9.3	10.6	10.5
FI	19.8	14.6	18.7	13.2	16.2	11.5	15.2	10.6	18.9	15.6	17.7	14.6	15.7	13.1	15.0	12.3
FR	10.8	10.3	11.5	9.6	12.0	8.9	12.7	9.6	11.9	11.6	12.4	10.1	12.4	10.2	13.0	11.1
HR	-	-	-	-	4.5	14.1	9.4	14.6	-	-	-	-	5.8	13.8	9.0	14.7
HU	4.1	9.2	6.7	9.0	3.3	9.7	5.7	11.0	8.3	10.8	9.5	10.8	6.2	10.2	8.8	13.2
IT	3.5	11.8	3.1	8.7	2.9	7.1	1.4	7.6	2.2	12.8	1.9	10.0	2.0	10.6	1.3	10.0
LT	9.8	15.1	6.6	14.4	4.6	11.2	-	-	11.9	18.1	7.5	19.4	6.8	13.4	-	-
LV	7.0	12.5	5.7	9.4	10.7	12.2	14.3	15.0	9.6	15.4	8.3	15.2	12.7	15.3	14.9	16.8
NL	15.9	8.4	14.2	6.8	13.2	5.8	12.4	6.5	16.9	8.9	15.3	8.3	15.0	7.7	13.6	7.7
PL	4.1	12.4	1.7	9.6	5.8	12.1	6.2	10.3	2.1	11.9	-0.3	10.9	4.4	13.0	5.9	12.7
PT	7.0	17.0	9.6	15.4	10.9	13.6	-	-	4.0	16.1	7.5	12.9	9.6	11.2	-	-
RO	5.5	10.7	6.3	6.7	0.0	5.6	0.3	9.9	6.2	11.7	7.5	8.2	2.4	9.0	1.2	14.5
SE	13.1	6.4	12.4	6.2	11.2	5.3	9.6	5.3	13.7	8.5	12.8	7.8	11.6	6.8	9.9	6.7
SI	-	-	-	-	0.9	10.4	4.3	12.3	-	-	-	-	1.4	12.5	4.9	15.3
SK	21.3	18.5	14.9	14.6	14.9	12.4	15.5	11.4	20.9	17.2	15.4	15.5	15.4	14.0	15.9	13.7

Source: SES based on author's own computations.
Notes: GPG - columns (1) - and adjusted components - columns (2) - in percentage points from the decomposition of hourly wages using the OB and Ñopo matching methods. In the OB case, the GPG is expressed as the difference in average log hourly wages whereas (3) is decomposed in the Ñopo case. Blue (red) cells indicate low (high) values of the (adjusted) GPG across countries (per column).

The second set of countries see their adjusted gaps increase compared to the original measure. This affects particularly countries in which the raw GPG was small to begin with, such as Croatia, Hungary, Italy, Lithuania, Poland, Portugal, Romania and Slovenia. Therefore, women in these countries tend to 'possess' more of the characteristics with higher returns in the labour market (e.g. high education level and working in white-collar occupations, see Table 8 and Table 9). This observation can be linked to the concerns on biased GPG due to self-selection (see also the discussion in section 3.2). More precisely, the fact that women who would earn low wages tend to stay out of the labour force in (some of) these countries (Olivetti and Petrongolo, 2008), mechanically raises women's level of education in the labour force (consistent with evidence in Table 8) contributing to increase the adjusted pay gap. As such, working with the adjusted pay gap accounts, at least partly, for the bias resulting from women self-selection in the labour force.

Finally, we can identify a residual group of countries for which the GPG and adjusted GPG are similar (e.g.

[34] The detailed OB decomposition results in Table 19 and Table 20 in Appendix A.6 also highlight the important contributions of industrial segregation, and, to a lesser extent, of firm ownership in Finland, the Netherlands and Sweden.

Czechia, Spain, France and Slovakia). Hence, in these countries, differences in observed characteristics tend to be small or compensate each other and they do not contribute much to explain the GPG.

3.3.2 Industrial Relations and the gender pay gap

Table 11 displays estimation results for the GPG and its adjusted components. The table also shows estimated coefficients for the control variables. These are the gender gaps in TU density and labour force participation rates, the log of GDP per capita and spending on child allowance/care[35]. The gender gap in labour force participation rates is included to try to capture effects related to self-selection (Olivetti and Petrongolo, 2008). The evidence on the impact of this issue suggests that the coefficient should be positive, at least for the unadjusted GPG, since a large and negative labour force participation gap is expected to be associated with a low GPG. It is, however, unclear how the unexplained part could be affected by the selection bias. When it comes to the IR index, we expect the coefficient to be negative since high values of the index are associated with strong unions and centralisation/coordination of wage bargaining, which are characteristics seen as leading to wage compression and lower inequality (Blau and Kahn, 2003). As such,we can also expect a negative effect of the *bargaining* and *TU strength* dimensions on the GPG.

From Table 11, we note that the IR index's coefficients are never (jointly) significant when the unadjusted GPG is used as dependent variable (whether in log or in level). Furthermore, it is interesting to point the relative stability of the estimated coefficients across the different dependent variables used (log vs level and OB vs Ñopo) except in a few instances. The coefficient in the linear specification is negative and significant at 5 % (10 %) for the Ñopo (OB) adjusted GPG. Nevertheless, the quadratic specification seems to be preferred, given the joint significance of both coefficients. Interestingly, the evidence at the bottom of Table 11 suggests a possible U-shaped effect with minimum value around an IR index of 41. This implies that the IR effect is smaller for low and high values of the index. Whereas we were expecting the former effect (low values of the index imply weak social partners and company level bargaining), the latter effect is more surprising[36]. A possible explanation could be that countries with high IR index values tend to also be the richest in terms of GDP per capita (i.e. Belgium, Denmark, the Netherlands and Sweden) with relatively low labour force participation rate gaps. According to the estimated parameters in Table 11, these two factors contribute negatively to the adjusted GPG.

We return to this result when discussing the estimation for each IR dimension separately (Table 12) but before doing so, it is worth briefly commenting on results for other control variables. Firstly, the gap in TU density is found to have a negative effect on the unexplained GPG, which is significative at 5 % in the quadratic specification. The results imply that a 1 point increase in female TU density relative to male TU density leads to a decrease of 0.07/0.08 points in the GPG. This negative effect can be seen as consistent with recent and renewed evidence on wage premiums associated with TU membership (Card et al., 2020). Secondly, the estimated parameter for the labour force participation rate gap is found to be positive for the unadjusted gap (as expected) but negative for the adjusted measures of the pay gap. The effect is, however, only statistically significant in the Ñopo matching case.

Focusing now on the results by IR dimensions (Table 12), we note that *bargaining* and *involvement* have negative effects on both the unadjusted and adjusted GPGs in the linear and/or quadratic specifications. When looking specifically at the Ñopo-adjusted GPG, we can see that the effects of *bargaining* and *involvement* are strictly negative over their interval of values and the U-test rejects the U-shaped hypothesis. Therefore, the effects of these dimensions appear to be strictly decreasing in the dimensions' values. On the other hand, the effect of *TU strength* is estimated to be either U-shaped or strictly increasing in the dimension's

[35] As in section 2.2, we perform a robust Hausman test based on Wooldridge (2010) to arbitrate between RE and FE. The linear specifications favour RE whereas the quadratic specifications suggest RE estimates are not consistent. Table 22 displays RE results.
[36] Note that the IR index effect becomes positive for values above 83/85. However, this concerns only nine observations in the sample for Belgium, the Netherlands and Sweden.

values. In any cases, the effect increases as *TU strength* increases as well (after a value of 5 at least). The effect even becomes positive for average and high values of the dimension. High values of this dimension are obtained for countries with strong TU, where strong stands for high density rate, more stringent hiring and firing regulations and a high employment share in the government sector. Hence, the results indicate that these factors, supporting the strength of TU, could contribute positively to the (adjusted) GPG when they become too important. Considered together, these results can help understand the U-shaped effect reported for the IR index in Table 11, which given the correlation between the three IR dimensions, is likely to come from *TU strength*. Overall, the negative effects estimated for *bargaining* and *involvement* (through work councils with substantial information and consultation rights) can be seen as consistent with the academic literature highlighting the negative effects of these dimensions on the GPG via wage compression and lower inequalities (Blau and Kahn, 2017; Heinze and Wolf, 2010).

Table 11. Estimation results - gender pay gap - fixed effects

	Δln(w)		Δw		OB		Ñopo	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
IR	0.02	-0.21	0.04	-0.15	-0.08*	-0.37†	-0.07‡	-0.35†
	(0.1)	(0.2)	(0.1)	(0.1)	(0.0)	(0.1)	(0.0)	(0.1)
IR^2	-	0.00‡	-	0.00‡	-	0.00†	-	0.00†
	-	(0.0)	-	(0.0)	-	(0.0)	-	(0.0)
ΔUD	0.02	0.01	0.04	0.03	-0.05	-0.07‡	-0.06	-0.08‡
	(0.1)	(0.1)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)
$\Delta\, lfp$	0.41	0.32	0.33	0.26	-0.21	-0.32	-0.32‡	-0.42†
	(0.3)	(0.3)	(0.3)	(0.2)	(0.2)	(0.2)	(0.1)	(0.1)
GDP pcap	13.21	9.84	12.61	9.83	0.14	-4.09	-2.64	-6.7*
	(9.9)	(9.6)	(8.8)	(8.7)	(5.1)	(5.1)	(4.2)	(3.9)
SPB – GDP pc.	-0.01	0.96	-0.05	0.75	0.03	1.24	0.97	2.13*
	(1.2)	(1.0)	(1.1)	(1.1)	(1.4)	(1.1)	(1.5)	(1.3)
FCA – GDP pc.	-1.08	-2.27	0.07	-0.91	-0.46	-1.95	-0.39	-1.82
	(1.9)	(2.1)	(2.1)	(2.2)	(2.1)	(1.6)	(2.0)	(1.6)
2010	-2.29‡	-2.66†	-2.14‡	-2.44†	-1.96†	-2.43†	-1*	-1.45†
	(1.0)	(1.0)	(0.9)	(0.8)	(0.7)	(0.7)	(0.5)	(0.5)
2014	-4.23†	-4.05†	-3.37†	-3.22†	-3.11†	-2.89†	-1.49†	-1.28‡
	(1.3)	(1.2)	(1.2)	(1.1)	(0.9)	(0.8)	(0.6)	(0.5)
2018	-5.77‡	-4.9‡	-4.94‡	-4.23‡	-3.03‡	-1.94*	-0.7	0.34
	(2.4)	(2.2)	(2.1)	(2.1)	(1.2)	(1.1)	(0.9)	(0.9)
F-test	-	0.13	-	0.11	-	0.00	-	0.00
U-test	-	0.16	-	0.22	-	0.00	-	0.00
Shape	-	U	-	U	-	U	-	U
Int.	-	[8;93]	-	[8;93]	-	[8;93]	-	[8;93]
<0	-	[8;60]	-	[8;51]	-	[8;85]	-	[8;83]
TP	-	30	-	26	-	42	-	41
R_w^2	0.27	0.31	0.25	0.28	0.56	0.63	0.44	0.56
R_b^2	0.17	0.09	0.10	0.06	0.15	0.39	0.17	0.01

† p<0.01, ‡ p<0.05, * p<0.1

Notes: Estimation results for the FE model. For the (adjusted) GPG, the table displays estimated coefficients assuming linear (1) and non-linear (2) effects of IR on the GPG. For the non-linear estimation, the table further shows the p-value from a joint F-test of significativity on the IR index and IR index^2 coefficients, the shape of the relationship tested and the p-value from the U-test (Lind and Mehlum, 2010), the interval of IR index values (Int.), the interval over which the estimated effect is negative (≤ 0) and the turning point (TP). No p-value from the U-test is reported when the extremum lies outside the range of IR values (the relation is monotonic over the range of observed IR index values). Clustered standard errors at the country level in parentheses.

Table 12. Estimation results by IR dimensions - gender pay gap - fixed effects

	Δln(w)		Δ*w*		OB		Ñopo	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
TU str.	0.21	0.62*	0.22	0.56	0.11	-0.28	0.22	-0.4*
	(0.2)	(0.4)	(0.2)	(0.4)	(0.1)	(0.2)	(0.1)	(0.2)
TU str.^{2}	-	-0.03	-	-0.02	-	0.03*	-	0.04†
	-	(0.0)	-	(0.0)	-	(0.0)	-	(0.0)
F-test	-	0.26	-	0.34	-	0.18	-	0.01
U-test	-	0.16	-	0.23	-	0.08	-	0.04
Shape	-	I	-	I	-	U	-	U
Int.	-	[0;17]	-	[0;17]	-	[0;17]	-	[0;17]
<0	-	>17	-	>17	-	[0;10]	-	[0;9]
TP	-	11	-	12	-	5	-	5
Barg.	0.15	-0.8‡	0.15	-0.7†	-0.07	-0.52†	-0.13†	-0.32‡
	(0.1)	(0.3)	(0.1)	(0.3)	(0.1)	(0.2)	(0.0)	(0.1)
Barg.^{2}	-	0.03†	-	0.03†	-	0.01†	-	0.01
	-	(0.0)	-	(0.0)	-	(0.0)	-	(0.0)
F-test	-	0.00	-	0.00	-	0.01	-	0.00
U-test	-	0.01	-	0.01	-	0.01	-	0.27
Shape	-	U	-	U	-	U	-	U
Int.	-	[1;33]	-	[1;33]	-	[1;33]	-	[1;33]
<0	-	[1;27]	-	[1;26]	-	[1;33]	-	[1;33]
TP	-	13	-	13	-	18	-	26
Invol.	-0.34†	-0.39‡	-0.23†	-0.27*	-0.3†	-0.58†	-0.16‡	-0.4†
	(0.1)	(0.2)	(0.1)	(0.2)	(0.1)	(0.2)	(0.1)	(0.1)
Invol.^{2}	-	0.00	-	0.00	-	0.01	-	0.01‡
	-	(0.0)	-	(0.0)	-	(0.0)	-	(0.0)
F-test	-	0.00	-	0.00	-	0.00	-	0.01
U-test	-	-	-	-	-	0.31	-	0.07
Shape	-	U	-	U	-	U	-	U
Int.	-	[0;31]	-	[0;31]	-	[0;31]	-	[0;31]
<0	-	[0;31]	-	[0;31]	-	[0;31]	-	[0;31]
TP	-	100	-	82	-	24	-	20
Oth.	1.34‡	2.2*	1.06*	1.86*	0.77	1.15	0.61	0.63
	(0.7)	(1.2)	(0.6)	(1.0)	(0.5)	(0.9)	(0.4)	(0.6)
Oth.^{2}	-	-0.13	-	-0.12	-	-0.06	-	0.00
	-	(0.1)	-	(0.1)	-	(0.1)	-	(0.1)
F-test	-	0.13	-	0.16	-	0.32	-	0.39
U-test	-	0.32	-	0.27	-	0.44	-	-
Shape	-	I	-	I	-	I	-	-
Int.	-	[0;11]	-	[0;11]	-	[0;11]	-	[0;11]
<0	-	>11	-	>11	-	>11	-	>11
TP	-	9	-	8	-	10	-	96

† p<0.01, ‡ p<0.05, * p<0.1

Notes: Estimation results by IR dimension. For the (adjusted) GPG, the table displays estimated coefficients assuming linear (1) and non-linear (2) effects of IR on the GPG. For the non-linear estimation, the table shows the p-value from a F-test of significativity on the dimension and its quadratic coefficient, the shape of the relationship and the p-value from the U-test (Lind and Mehlum, 2010), the interval of index values (Int.), the interval over which the effect is negative (≤ 0) and the turning point (TP). No p-value from the U-test is reported when the TP lies outside the range of IR values. Clustered standard errors at the country level in parentheses.

4 Conclusion

This paper proposes an analysis of gender equality (GE) and Industrial Relations (IR) using data from European Member States between 2005 and 2018. The links between the two topics have already been studied in the academic literature, but usually considering narrower definitions of IR and GE, and focusing primarily on the effects of wage bargaining on the gender pay gap (GPG).

To quantitatively measure GE, we use the Gender Equality Index (GEI), published by the European Institute for Gender Equality (EIGE). The GEI is particularly relevant for our analysis since it acknowledges the multidimensional nature of GE in its construction. It uses statistical indicators from six domains including work, money, knowledge, time, power, and health. This allows us to study many different aspects of GE and we also analyse the relationship between IR and each of these domains separately.

With regards to IR, wage bargaining is obviously one of the key dimensions but trade union strength or workers' involvement at the firm level are also important IR characteristics. We measure IR using the index built by Ounnas (2022). This index is constructed from 24 variables on various dimensions of IR and has the advantage of being available at yearly frequency and for all European countries. The index is relevant for our analysis since it assigns high values to IR systems with strong social partners (i.e. high TU and EO density), some degree of centralisation and coordination of wage bargaining, social dialogue and workers/unions' representation at the firm level through work councils (WC). Thus, our analysis tries to uncover if these IR characteristics can be linked to countries which perform better in terms of GE.

We estimate static panel data models (random and fixed effects) and explore the possibility of non-linear effects of IR on GE. We further control for macroeconomic characteristics and year effects. Results for the random effects model indicate a positive association between the IR index and the GEI. In other words, countries with IR supporting social dialogue and collective bargaining (CB), appear to obtain higher scores in terms of GE. Additional evidence suggests that the positive effect could be non-linear and greater for countries featuring all the above IR characteristics. Estimation results for each domain of the GEI show that the positive effect of IR goes primarily through the money and power domains. No consistent effects are found for the remaining domains across the various models and specifications tested. This could reflect the limited effects of social dialogue and CB on the indicators used to construct these domains or a lack of consideration for these issues from social partners when bargaining. Furthermore, we investigate whether any specific dimension of IR drives these results. The results show that most IR dimensions, among which, *TU strength*, *bargaining*, and *involvement*, have significant positive effects on the GEI, and the money and power domains.

In the second part of the paper, we take a closer look at the GPG using individual-level data from the SES. We compute the GPG in hourly earnings, including payments for overtime and shift work, which is then decomposed using the Oaxaca-Blinder (OB) method and Ñopo (2008) exact matching. The decomposition yields a GPG measure corrected for differences in firms' and individual characteristics. The adjusted GPG is our main variable of interest, which we analyse at country level similarly to the EIGE indices. The results show that higher values of the IR index are associated with lower adjusted GPG. However, the relationship appears to be U-shaped and the effects of IR could be positive for high index values. Estimation results by IR dimensions help shed some light on the U-shaped effect. Firstly, the IR dimensions on *bargaining* and *involvement* have significant and negative effects on the GPG, consistent with evidence from the academic literature (Blau and Kahn, 2003; Heinze and Wolf, 2010). Secondly, the dimension capturing *trade union strength* is estimated to have a U-shaped or strictly increasing effect, which becomes positive when trade unions are strong. This could contribute to explain the U-shaped effect reported for the overall IR index.

Finally, it is worth mentioning that a gendered IR variable, namely the gender gap in trade union density, has been included in all the specifications and models tested. The aim was to identify whether more feminised union membership could result in better GE performance given the evidence on wage premium for union

members. It should be kept in mind that this variable required significant adjustments and its quality could therefore be questioned. Nevertheless, the gender gap in TU density was rarely found to have a significant effect on GE when using the EIGE indices, but a negative effect was found on the GPG.

Although data limitations should not be forgotten, the results seem to point towards a positive association between GE and IR characterised by strong social partners, social dialogue and CB. The positive effect of IR seems to be driven by the impact on money and power indicators. The analysis of the GPG constitutes additional evidence of the positive impact that CB and WC can have on pay disparities and, more generally, that social dialogue and bargaining can have on GE.

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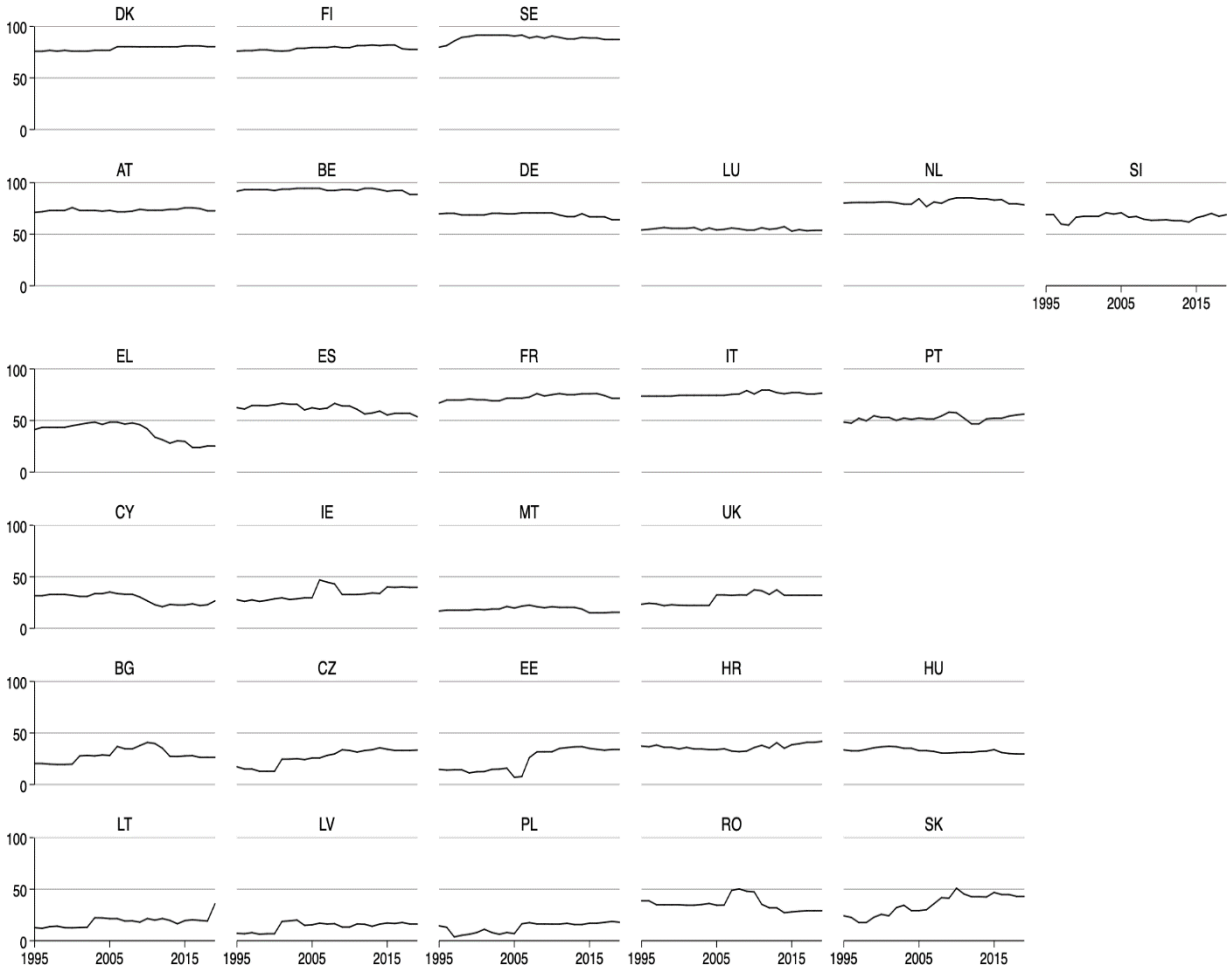
A. Appendix

A.1. Industrial Relations index

Figure 3. Industrial Relations index - 1995-2019



Source: Ounnas (2022)

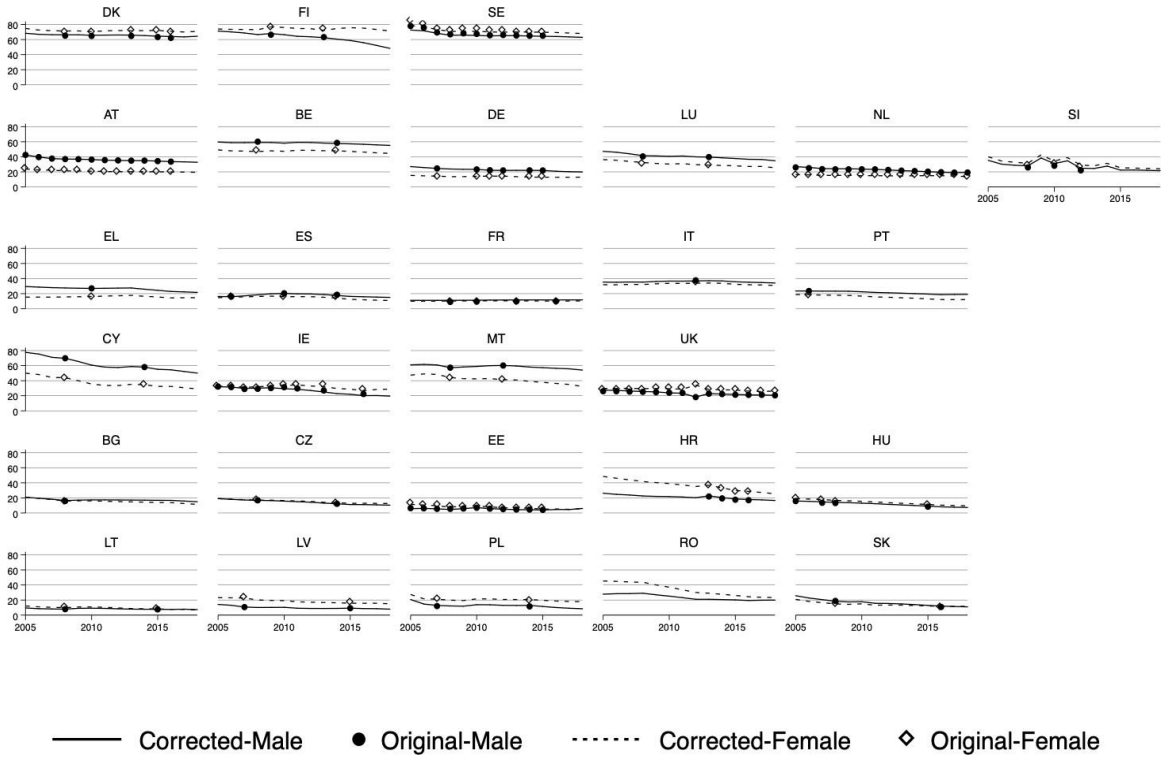
Note: Overall IR index for the period 1995-2019 and grouped in rows by IR regime Visser (2009b).

A.2. Trade union density gender gap

TU density time series suffer from issues related to missing observations and the problem becomes even more acute when the gender dimension is taken into account. The main source of data for gendered TU density series is the OECD/AIAS database which is based on the ICTWSS dataset developed by Jelle Visser. The original ICTWSS is no longer updated since 2018 and the data is more problematic than the series provided by the OECD/AIAS version which have been 'cleaned-up'. However, the series contain much more observation, and we therefore use this source for the time series.

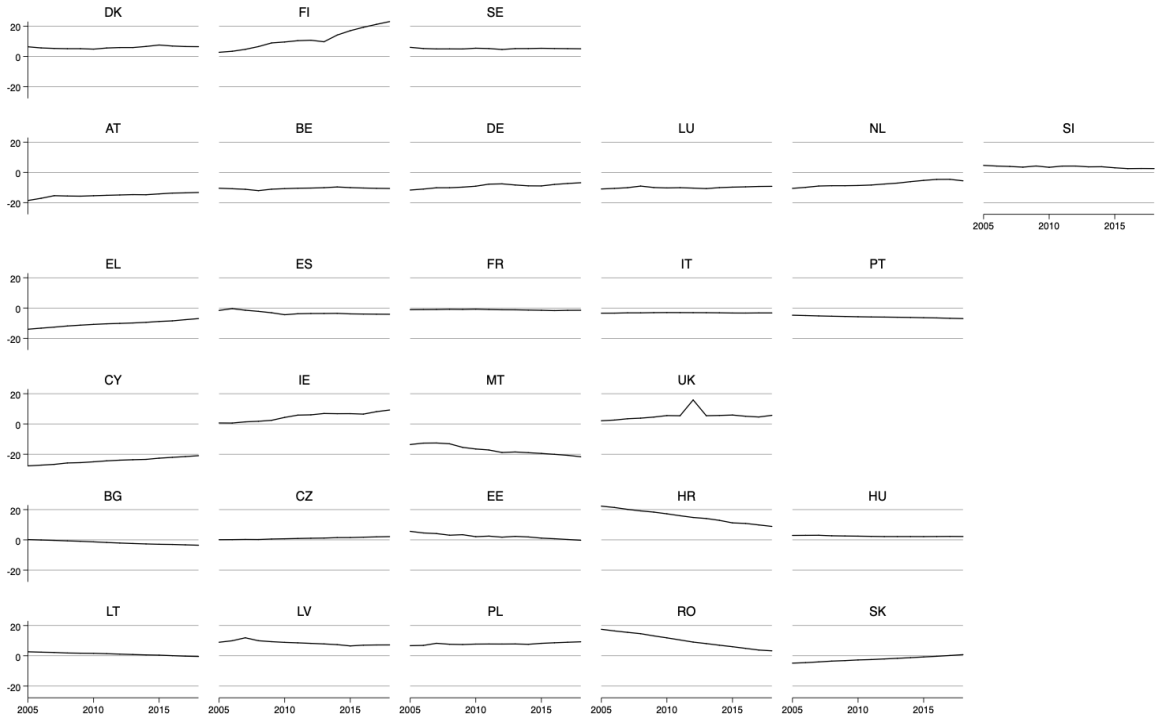
To adjust missing values, we follow Ounnas (2022) and estimate a dynamic panel for female (and male) TU density using exogenous variables known to be correlated with TU density (Schnabel, 2013; Ounnas, 2022). We then retrieve the male (or female) series using the fact that the aggregate TU density rate is a weighted average of the male and female rates where weights are shares of male and female in private employment. Figure 4 displays male and female TU density rate whereas Figure 5 shows the gaps (difference).

Figure 4. Trade union density rates by gender



Source: *Own computations.*

Figure 5. Gender gap in trade union density rates



Source: *Own computations.*

A.3. Control variables descriptive statistics

See section 2.1.3 for more information on the variables displayed in Table 13.

Table 13. Average control variables by country

	Economic variables					Population characteristics							Social exp.			Employment shares									
		gaps				Ed. gap		Tenure gap					gdp perc.			Sectors				Occupations					
	gdp/ca	u	lfpr	temp.	pt	0-2	5-8	1-2	2 – 4	≥ 5	Marr.	Births	1	2	3	B-F	G-N	O	P-U	1	2	3	4	5	8
O.C.	44.2	-0.3	-4.8	4.1	19.1	-2.5	9.1	0.3	-0.5	-1.7	6.8	26.5	3.2	0.8	1.2	21.5	39.3	5.6	31.0	6.2	25.5	21.4	8.5	21.3	8.3
DK	47.9	0.1	-6.4	1.9	21.5	-1.5	7.0	0.6	0.2	-2.8	7.3	26.3	3.8	0.9	1.5	20.8	38.9	5.8	32.1	4.8	24.8	22.1	9.7	20.6	6.4
FI	39.8	-0.7	-3.5	6.4	10.1	-4.6	10.6	0.6	-0.5	-2.8	6.4	24.8	3.0	0.7	1.0	23.6	38.7	4.7	29.0	7.5	25.1	20.9	7.7	21.2	9.4
SE	44.8	-0.3	-4.5	4.0	25.8	-1.5	9.8	-0.4	-1.2	0.4	6.6	28.2	2.9	0.6	1.0	20.0	40.2	6.2	31.9	6.2	26.7	21.2	8.2	22.2	9.2
S.P.	43.7	0.5	-10.8	1.6	32.3	2.3	0.6	0.6	0.7	-3.0	5.0	23.9	2.4	1.4	0.4	23.8	40.4	7.9	24.9	7.7	24.2	20.5	13.2	16.0	8.1
AT	39.8	-0.2	-10.7	-0.1	35.6	6.9	-2.4	1.3	2.3	-4.8	5.7	21.7	2.9	1.8	0.5	26.3	41.7	6.7	20.9	6.9	16.9	24.0	14.0	19.7	7.1
BE	36.4	0.2	-11.2	2.7	33.1	-2.0	5.0	0.1	0.3	-0.9	5.0	26.6	2.1	1.5	0.1	22.8	38.8	9.1	28.0	10.8	25.5	15.3	15.1	14.2	8.0
DE	35.5	-0.5	-10.7	0.0	36.8	2.9	-4.8	0.9	1.1	-3.3	5.7	19.6	3.1	1.7	0.6	28.6	38.9	7.3	23.6	5.9	19.2	26.3	15.2	16.0	7.8
LU	91.2	1.3	-13.5	1.3	31.4	2.7	-1.9	0.9	1.5	-3.7	4.5	26.9	3.5	2.0	0.6	13.3	43.8	11.6	29.9	4.3	35.5	20.8	12.8	11.1	5.4
NL	40.6	1.0	-11.1	2.8	51.3	1.2	-0.8	0.5	0.7	-5.7	5.2	25.4	1.1	0.7	0.3	18.0	44.0	6.8	28.7	9.1	25.1	19.0	12.1	19.1	5.5
SI	19.0	1.1	-7.5	2.9	5.8	2.2	8.7	-0.1	-1.4	0.6	3.9	23.3	1.9	0.7	0.5	33.8	35.2	6.2	18.2	9.3	23.2	18.0	9.9	15.9	14.7
S.C.	24.2	2.7	-14.4	2.1	15.7	-3.3	3.7	0.7	0.9	-2.8	4.9	22.6	1.4	0.5	0.3	24.0	40.5	7.7	22.1	7.9	18.5	16.9	12.9	21.0	9.7
EL	18.3	7.4	-19.7	3.0	7.0	-2.8	1.2	1.0	1.7	-4.2	6.0	21.3	1.1	0.5	0.1	18.4	42.9	8.8	18.2	8.5	22.6	11.1	14.5	25.2	9.0
ES	23.6	2.5	-14.1	2.4	17.6	-4.1	3.5	1.2	2.1	-5.2	4.6	22.6	1.3	0.2	0.5	23.3	43.8	7.1	21.6	6.8	18.4	13.8	11.8	23.3	9.8
FR	32.9	0.2	-8.9	1.7	23.4	0.8	3.9	0.1	-0.1	-0.4	4.9	29.3	2.5	1.1	0.6	22.0	38.5	9.7	27.0	8.9	18.3	22.7	12.0	17.2	9.3
IT	28.7	2.2	-21.2	2.6	23.5	-3.0	3.4	1.1	1.5	-4.9	4.4	19.7	1.1	0.4	0.1	28.3	40.4	6.0	21.6	6.8	15.0	23.3	14.8	17.8	9.5
PT	17.6	1.1	-8.2	0.7	7.0	-7.1	6.6	-0.2	-0.6	0.7	4.5	20.1	1.2	0.4	0.3	27.9	36.8	6.9	22.2	8.7	17.9	13.5	11.6	21.6	11.1
Lib.	30.4	-0.6	-20.1	4.9	15.7	-1.6	4.6	2.1	2.5	-7.3	7.8	28.9	1.6	1.1	0.0	21.3	45.6	7.0	23.2	9.0	20.5	14.4	13.6	21.4	7.3
CY	23.0	0.0	-13.6	11.1	6.9	-0.8	6.2	2.0	2.3	-7.6	9.4	26.5	1.6	0.7	0.0	19.8	47.2	7.9	22.1	4.5	19.5	15.3	15.0	20.7	6.0
IE	48.3	-2.5	-14.9	1.1	21.5	-5.7	6.5	0.8	1.3	-2.5	6.3	37.7	2.0	1.8	0.0	20.6	45.0	4.8	24.9	12.1	25.1	10.7	12.4	22.1	7.3
MT	19.9	0.8	-31.7	2.5	19.2	1.8	1.0	3.5	3.9	-11.8	7.7	22.6	1.1	0.8	0.1	23.5	44.5	8.3	22.5	10.5	16.9	17.2	13.4	21.4	8.5
Mix.	11.2	-0.3	-11.1	-0.4	3.9	0.2	6.9	-0.1	-0.6	1.3	6.4	22.7	1.7	0.6	0.2	31.5	35.8	6.8	17.1	8.5	19.5	16.9	8.8	19.0	15.7
BG	5.9	-1.0	-8.5	-0.7	0.6	-0.8	9.4	-0.2	-0.6	1.6	4.4	21.4	1.6	0.5	0.1	32.5	38.5	7.4	14.7	7.8	17.9	11.7	8.3	23.5	16.9
CZ	15.4	2.1	-15.8	3.2	7.0	3.8	0.7	1.7	1.5	-6.5	5.8	24.4	1.8	0.8	0.0	38.9	34.5	6.5	16.9	6.9	16.0	24.9	10.6	17.1	17.9
EE	15.1	-1.7	-7.2	-1.3	6.8	-6.6	15.2	-0.8	-2.3	3.0	5.7	24.0	1.8	0.5	0.0	32.1	38.3	6.4	19.0	14.3	21.3	15.8	6.7	15.4	16.2
HR	10.8	1.6	-11.3	0.6	3.1	6.1	3.5	0.3	-0.4	0.1	6.1	21.5	1.7	0.5	0.4	28.7	38.1	6.5	16.6	6.1	17.1	18.6	13.6	21.8	13.2
HU	10.9	0.1	-12.9	-0.7	3.8	3.5	4.7	0.2	-0.3	0.0	5.2	21.1	2.5	1.1	0.1	31.4	36.7	8.5	18.7	7.4	18.3	17.5	10.3	18.8	16.4
LT	11.5	-2.6	-4.4	-1.7	3.5	-3.8	10.9	-1.7	-1.4	7.5	8.5	21.3	1.5	0.2	0.1	26.8	37.5	5.9	20.5	11.9	26.7	13.4	5.5	17.2	13.9
LV	11.5	-2.6	-6.5	-2.6	4.0	-7.3	12.6	-0.5	-1.4	5.0	7.3	21.9	1.4	0.3	0.1	25.1	40.0	7.2	19.2	11.7	19.2	17.2	6.8	17.7	11.9
PL	10.2	1.1	-13.6	-0.3	6.0	-0.8	7.4	-0.5	-0.8	1.6	6.9	23.1	1.5	0.5	0.4	31.1	33.4	6.6	16.5	8.7	23.8	16.1	9.5	17.8	14.2
RO	7.5	-1.5	-16.6	-0.5	0.7	5.6	0.9	-0.5	-0.2	1.9	8.1	23.6	1.5	0.6	0.4	31.0	27.5	5.3	11.4	3.8	20.6	12.5	7.4	20.7	18.1
SK	13.4	1.4	-14.5	0.4	3.1	2.7	3.4	0.9	0.1	-1.5	6.3	24.1	1.6	0.8	0.0	37.6	33.8	8.1	17.1	6.2	13.9	21.4	9.3	20.4	18.4

Notes: The columns u, lfpr, temp. and pt display average differences between female and male rates. The following five columns show gaps in education and tenure for various durations. The columns Marr. and Births give average values for the number of marriage (resp. birth) per 10 000 individuals (women) aged 18 (16) and over. The columns 1, 2, 3 under Social exp. stand for social expenditures in respectively, Social Protection Benefits, Family Child Allowance and Child DayCare expressed in percentage of gdp. The remaining columns show sectoral and occupational employment shares.

A.4. Detailed estimation results

- Seemingly unrelated regressions

Table 14. Full estimation results – seemingly unrelated regressions

	Work		Money		Know		Time		Power		Health	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
IR												
	-	-										-
IR	0.03†	0.11‡	0.14†	0.00	0.03	0.03	0.16†	-0.14	0.26†	-0.31†	0.02†	0.18†
	(0.01)	(0.04)	(0.02)	(0.06)	(0.02)	(0.09)	(0.03)	(0.13)	(0.01)	(0.04)	(0.01)	(0.04)
IR^2	-	0.00*	-	0.00‡	-	0.00	-	0.00‡	-	0.01†	-	0.00†
	-	(0.00)	-	(0.00)	-	(0.00)	-	(0.00)	-	(0.00)	-	(0.00)
ΔUD	0.02	0.01	-0.02	-0.03	0.12†	0.14†	0.12‡	0.15†	0.15†	0.13†	0.05†	-0.01
	(0.02)	(0.02)	(0.03)	(0.02)	(0.03)	(0.04)	(0.05)	(0.06)	(0.02)	(0.02)	(0.02)	(0.02)
Economic												
GDP pcap	0.04†	0.07†	0.20†	0.24†	0.02	0.00	0.28†	0.28†	0.09†	0.27†	0.04†	0.11†
	(0.02)	(0.02)	(0.03)	(0.02)	(0.03)	(0.04)	(0.05)	(0.06)	(0.02)	(0.02)	(0.01)	(0.01)
					-	-						
Δlfp	0.42†	0.40†	-	-	0.63†	0.58†	-	-	-	-	-	-
	(0.03)	(0.03)	-	-	(0.07)	(0.07)	-	-	-	-	-	-
						-						
Δu	-	-	-	-	-0.4†	0.59†	-	-	-	-	0.22†	0.00
	-	-	-	-	(0.15)	(0.16)	-	-	-	-	(0.08)	(0.09)
Δtemp	-	-	-	-	-	-	-	-	-1.23†	-1.24†	-	-
	-	-	-	-	-	-	-	-	(0.08)	(0.06)	-	-
Pers. Charac.												
						-						
Δeduc 5Y-8Y	-0.07	-0.05	-	-	-0.05	0.21*	0.64†	0.33‡	-	-	-0.02	-0.05
	(0.05)	(0.05)	-	-	(0.1)	(0.11)	(0.15)	(0.16)	-	-	(0.05)	(0.06)
Δtenure 2Y-5Y	-	-	0.66†	0.35‡	-	-	-	-	-	-	0.17*	0.03
	-	-	(0.18)	(0.16)	-	-	-	-	-	-	(0.09)	(0.1)
Δtenure > 5Y	-	-	-	-	-	-	-0.12	0.10	-	-	-	-
	-	-	-	-	-	-	(0.15)	(0.16)	-	-	-	-
Soc. Exp												
CDC - gdp pc.	-	-	3.17†	2.14†	-	-	-	-	-	-	-	-
	-	-	(0.72)	(0.62)	-	-	-	-	-	-	-	-
FCA - gdp pc.	2.25†	2.11†	-	-	-	-	-	-	10.65†	12.19†	4.38†	1.63*
	(0.64)	(0.63)	-	-	-	-	-	-	(0.8)	(0.66)	(0.72)	(0.83)
Sect. shares												
					-	-						
B-F	-	-	-	-	0.26†	0.26‡	0.10	0.01	-0.03	-0.06	-	-
	-	-	-	-	(0.09)	(0.1)	(0.14)	(0.15)	(0.06)	(0.04)	-	-
G-N	-	-	0.32†	0.25†	-	-	-	-	-	-	0.77†	0.39†
	-	-	(0.08)	(0.07)	-	-	-	-	-	-	(0.05)	(0.06)
O	-	-	-	-	0.33	0.44*	-	-	-1.19†	-0.93†	0.42†	0.49†
	-	-	-	-	(0.24)	(0.25)	-	-	(0.14)	(0.11)	(0.12)	(0.13)
P-U	0.33†	0.24†	-	-	0.92†	0.92†	0.41‡	0.13	0.96†	0.46†	-	-
	(0.05)	(0.06)	-	-	(0.12)	(0.14)	(0.19)	(0.21)	(0.07)	(0.06)	-	-
Occ. shares												
1	0.11*	0.09	0.15	0.26†	-0.05	-0.12	0.68†	0.42‡	-	-	0.14‡	-0.05
	(0.06)	(0.06)	(0.1)	(0.09)	(0.11)	(0.12)	(0.18)	(0.19)	-	-	(0.06)	(0.06)
2	-	-	-	-	-	-	-	-	-0.21†	-0.52†	-	-
	-	-	-	-	-	-	-	-	(0.06)	(0.05)	-	-
3	-	-	0.31†	0.34†	-	-	-	-	-0.53†	-0.77†	-	-
	-	-	(0.07)	(0.06)	-	-	-	-	(0.06)	(0.05)	-	-
					-	-						
4	-	-	0.17	0.5†	0.82†	0.76†	-	-	-1.07†	-1.21†	0.10	0.37†
	-	-	(0.12)	(0.1)	(0.13)	(0.13)	-	-	(0.08)	(0.07)	(0.07)	(0.08)
5	-	-	-	-	-0.06	-0.13	0.20	0.07	-	-	-	-
	-	-	-	-	(0.12)	(0.13)	(0.17)	(0.19)	-	-	-	-
F-test	.	0.00	.	0.00	.	.16	.	0.00	.	0.00	.	0.00
Shape	-	U	-	U	-	-	-	U	-	U	-	U

† p<0.01, ‡ p<0.05, * p<0.1

Notes: Estimates for year indicator variables are not reported

- Random effects

Table 15. Full estimation results – random effects

	GEI		Work		Money		Know		Time		Power		Health	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
IR														
IR	0.1†	-0.08	0.01	0.02	0.14	0.06	0.02	-0.10	0.05	-	0.28	0.01	0.02	-0.02
	(0.02	(0.07	(0.01	(0.03	(0.03	(0.07	(0.04	(0.13	(0.07	(0.12	(0.08	(0.16	(0.02	(0.03
IR^2	-	0.00	-	0.00	-	0.00	-	0.00	-	0.00	-	0.00	-	0.00
	-	(0.00	-	(0.00	-	(0.00	-	(0.00	-	(0.00	-	(0.00	-	(0.00
ΔUD	0.02	0.02	-0.01	-0.01	0.04	0.04	0.06	0.06	0.00	0.00	-0.07	-0.07	0.01	0.02
	(0.03	(0.03	(0.01	(0.01	(0.04	(0.03	(0.06	(0.06	(0.03	(0.03	(0.09	(0.08	(0.01	(0.01
Economic														
GDP pcap	0.07	0.08	0.07	0.07	0.19	0.18	0.02	0.03	0.14	0.13	0.10	0.12	0.05	0.05
	(0.04	(0.04	(0.03	(0.03	(0.05	(0.04	(0.04	(0.04	(0.06	(0.05	(0.10	(0.10	(0.03	(0.03
Δlfp	-	-	0.42	0.42	-	-	-0.2*	-	-	-	-	-	-	-
	-	-	(0.05	(0.05	-	-	(0.12	(0.11	-	-	-	-	-	-
Δu	-	-	-	-	-	-	-0.05	-0.07	-	-	-	-	-0.07	-0.07
	-	-	-	-	-	-	(0.19	(0.19	-	-	-	-	(0.09	(0.08
Δtemp	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	(0.17	(0.16	-	-	-	-	-	-	-	-	(0.43	(0.44	-	-
Pers. Charac.														
Δeduc 0Y-2Y	0.20	0.18	-	-	-	-	-	-	-	-	-	-	-	-
	(0.15	(0.15	-	-	-	-	-	-	-	-	-	-	-	-
Δeduc 5Y-8Y	0.14	0.13	-	-	-	-	0.06	0.06	0.45	0.45	-	-	-0.13	-0.13
	(0.15	(0.14	(0.07	(0.07	-	-	(0.19	(0.18	(0.28	(0.28	-	-	(0.09	(0.09
Δtenure 2Y-5Y	-	-	-	-	0.31	0.31	-	-	-	-	-	-	0.15	0.15
	-	-	-	-	(0.12	(0.13	-	-	-	-	-	-	(0.08	(0.08
Δtenure > 5Y	-	-	-	-	-	-	-	-	-0.24	-0.23	-	-	-	-
	-	-	-	-	-	-	-	-	(0.16	(0.15	-	-	-	-
Soc. Exp														
CDC - gdp pc.	-	-	-	-	2.17	2.19	-	-	-	-	-	-	-	-
	-	-	-	-	(0.62	(0.59	-	-	-	-	-	-	-	-
FCA - gdp pc.	2.32	2.62	1.80	1.80	-	-	-	-	-	-	8.41	8.70	1.36	1.35
	(1.47	(1.51	(0.67	(0.69	-	-	-	-	-	-	(4.31	(4.29	(0.75	(0.76
Sect. shares														
B-F	-0.15	-0.17	-	-	-	-	-0.14	-0.15	-0.24	-0.27	-	-0.54	-	-
	(0.14	(0.14	-	-	-	-	(0.16	(0.16	(0.21	(0.21	(0.33	(0.33	-	-
G-N	-	-	-	-	0.24	0.24	-	-	-	-	-	-	0.15	0.14
	-	-	-	-	(0.13	(0.12	-	-	-	-	-	-	(0.08	(0.07
O	-0.41	-0.45	-	-	-	-	0.53	0.51	-	-	-	-	0.30	0.31
	(0.32	(0.28	-	-	-	-	(0.29	(0.29	-	-	(0.98	(0.98	(0.18	(0.18
P-U	0.59	0.42	0.09	0.09	-	-	0.79	0.71	0.85	0.66	0.67	0.41	-	-
	(0.20	(0.19	(0.08	(0.08	-	-	(0.14	(0.15	(0.34	(0.39	(0.52	(0.57	-	-
Occ. shares														
1	0.31	0.30	0.15	0.15	0.40	0.42	0.16	0.15	0.37	0.37	-	-	0.14	0.15
	(0.14	(0.12	(0.05	(0.05	(0.11	(0.11	(0.22	(0.21	(0.19	(0.17	-	-	(0.05	(0.05
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	(0.47	(0.47	-	-
3	-	-	-	-	0.12	0.12	-	-	-	-	-0.57	-0.53	-	-
	-	-	-	-	(0.08	(0.08	-	-	-	-	(0.39	(0.41	-	-
4	-0.15	-0.12	-	-	0.34	0.36	-0.12	-0.11	-	-	-	-	0.13	0.13
	(0.16	(0.16	-	-	(0.16	(0.16	(0.16	(0.15	-	-	(0.63	(0.64	(0.05	(0.06
5	0.27	0.20	-	-	-	-	0.18	0.15	0.48	0.41	-	-	-	-
	(0.13	(0.14	-	-	-	-	(0.14	(0.15	(0.23	(0.22	-	-	-	-
F-test	-	0.00	-	0.43	-	0.00	-	0.26	-	0.08	-	0.00	-	0.26
U-test	-	0.22	-	-	-	-	-	0.25	-	0.06	-	-	-	0.35
Shape	-	U	-	-	-	-	-	U	-	U	-	-	-	U

† p<0.01, ‡ p<0.05, * p<0.1

Notes: Estimates for year indicator variables are not reported. Clustered standard errors at the country level in parentheses.

- Fixed effects

Table 16. Full estimation results – fixed effects

	GEI		Work		Money		Know		Time		Power		Health	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
IR														
IR	0.06	-0.05	0.02	0.04	0.15†	0.07	-0.02	-0.03	0.01	-0.12	0.18	0.08	0.01	0.00
	(0.04)	(0.07)	(0.01)	(0.03)	(0.04)	(0.08)	(0.06)	(0.14)	(0.07)	(0.13)	(0.11)	(0.23)	(0.02)	(0.03)
IR^2	-	0.00	-	0.00	-	0.00	-	0.00	-	0.00	-	0.00	-	0.00
	-	(0.00)	-	(0.00)	-	(0.00)	-	(0.00)	-	(0.00)	-	(0.00)	-	(0.00)
ΔUD	0.01	0.02	-0.01	-0.01	0.04	0.05	0.05	0.06	-0.02	-0.02	-0.09	-0.09	0.01	0.01
	(0.03)	(0.03)	(0.01)	(0.01)	(0.04)	(0.04)	(0.05)	(0.05)	(0.03)	(0.03)	(0.08)	(0.08)	(0.01)	(0.01)
Economic														
GDP pcap	-0.01	-0.01	0.07	0.07	0.05	0.05	-0.13	-0.13	0.07	0.06	0.02	0.02	0.01	0.01
	(0.12)	(0.12)	(0.04)	(0.04)	(0.07)	(0.07)	(0.12)	(0.12)	(0.09)	(0.09)	(0.3)	(0.3)	(0.04)	(0.04)
Δlfp	-	-	0.44†	0.44†	-	-	-0.09	-0.1	-	-	-	-	-	-
	-	-	(0.07)	(0.07)	-	-	(0.17)	(0.18)	-	-	-	-	-	-
Δu	-	-	-	-	-	-	0.14	0.14	-	-	-	-	-0.06	-0.06
	-	-	-	-	-	-	(0.2)	(0.2)	-	-	-	-	(0.09)	(0.09)
Δtemp	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0.53†	0.55†	-	-	-	-	-	-	-	-	1.83†	1.84†	-	-
	(0.2)	(0.19)	-	-	-	-	-	-	-	-	(0.57)	(0.57)	-	-
Pers. Charac.														
Δeduc 0Y-2Y	0.1	0.1	-	-	-	-	-	-	-	-	-	-	-	-
	(0.16)	(0.16)	-	-	-	-	-	-	-	-	-	-	-	-
Δeduc 5Y-8Y	0.08	0.07	-	-	-	-	0.21	0.21	0.36	0.36	-	-	-0.09	-0.09
	(0.18)	(0.17)	0.19‡	0.19‡	-	-	(0.28)	(0.28)	(0.35)	(0.34)	-	-	(0.11)	(0.11)
			(0.08)	(0.08)										
Δtenure 2Y-5Y	-	-	-	-	0.25*	0.26*	-	-	-	-	-	-	0.13*	0.13*
	-	-	-	-	(0.13)	(0.13)	-	-	-	-	-	-	(0.07)	(0.08)
Δtenure > 5Y	-	-	-	-	-	-	-	-	-0.25	-0.24	-	-	-	-
	-	-	-	-	-	-	-	-	(0.16)	(0.16)	-	-	-	-
Soc. Exp														
CDC - gdp pc.	-	-	-	-	1.24‡	1.38†	-	-	-	-	-	-	-	-
	-	-	-	-	(0.55)	(0.43)	-	-	-	-	-	-	-	-
FCA - gdp pc.	1.78	2.12	1.77†	1.74†	-	-	-	-	-	-	6.33	6.65	0.89	0.9
	(1.67)	(1.77)	(0.62)	(0.61)	-	-	-	-	-	-	(5.35)	(5.53)	(0.78)	(0.77)
Sect. shares														
B-F	-0.19	-0.21	-	-	-	-	-0.17	-0.17	-0.42	-0.44	-0.38	-0.39	-	-
	(0.17)	(0.17)	-	-	-	-	(0.22)	(0.22)	(0.26)	(0.27)	(0.51)	(0.52)	-	-
G-N	-	-	-	-	0.21*	0.22*	-	-	-	-	-	-	0.09	0.09
	-	-	-	-	(0.12)	(0.12)	-	-	-	-	-	-	(0.07)	(0.07)
O	-0.54	-0.57	-	-	-	-	0.3	0.3	-	-	-	-	0.28	0.28
											2.53‡	2.56‡		
	(0.37)	(0.35)	-	-	-	-	(0.33)	(0.34)	-	-	(1.1)	(1.09)	(0.18)	(0.18)
P-U	0.26	0.18	0.03	0.04	-	-	0.49‡	0.48‡	0.53	0.46	0.15	0.08	-	-
	(0.27)	(0.24)	(0.1)	(0.1)	-	-	(0.21)	(0.2)	(0.41)	(0.46)	(0.77)	(0.73)	-	-
Occ.shares														
1	0.28‡	0.29‡	0.14†	0.14†	0.47†	0.49†	0.16	0.16	0.32‡	0.33‡	-	-	0.15†	0.15†
	(0.13)	(0.12)	(0.05)	(0.05)	(0.13)	(0.12)	(0.2)	(0.2)	(0.16)	(0.16)	-	-	(0.06)	(0.06)
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
											0.97*	0.95*		
	-	-	-	-	-	-	-	-	-	-	(0.56)	(0.56)	-	-
3	-	-	-	-	0.1	0.1	-	-	-	-	-0.47	-0.45	-	-
	-	-	-	-	(0.1)	(0.09)	-	-	-	-	(0.46)	(0.47)	-	-
4	-0.15	-0.13	-	-	0.29	0.3*	-0.2	-0.2	-	-	-	-	0.11‡	0.11‡
											1.42*	1.38*		
	(0.16)	(0.17)	-	-	(0.19)	(0.18)	(0.19)	(0.18)	-	-	(0.76)	(0.78)	(0.05)	(0.05)
5	0.15	0.11	-	-	-	-	0.12	0.11	0.47*	0.43*	-	-	-	-
	(0.15)	(0.14)	-	-	-	-	(0.21)	(0.2)	(0.24)	(0.23)	-	-	-	-
F-test	-	0.19	-	0.18	-	0.00	-	0.93	-	0.62	-	0.31	-	0.94
U-test	-	0.3	-	0.43	-	-	-	-	-	0.2	-	-	-	-
Shape	-	U	-	I	-	-	-	-	-	U	-	-	-	-

† p<0.01, ‡ p<0.05, * p<0.1

Notes: Estimates for year indicator variables are not reported. Clustered standard errors at the country level in parentheses.

- Pooled OLS

Table 17. Full estimation results – pooled OLS

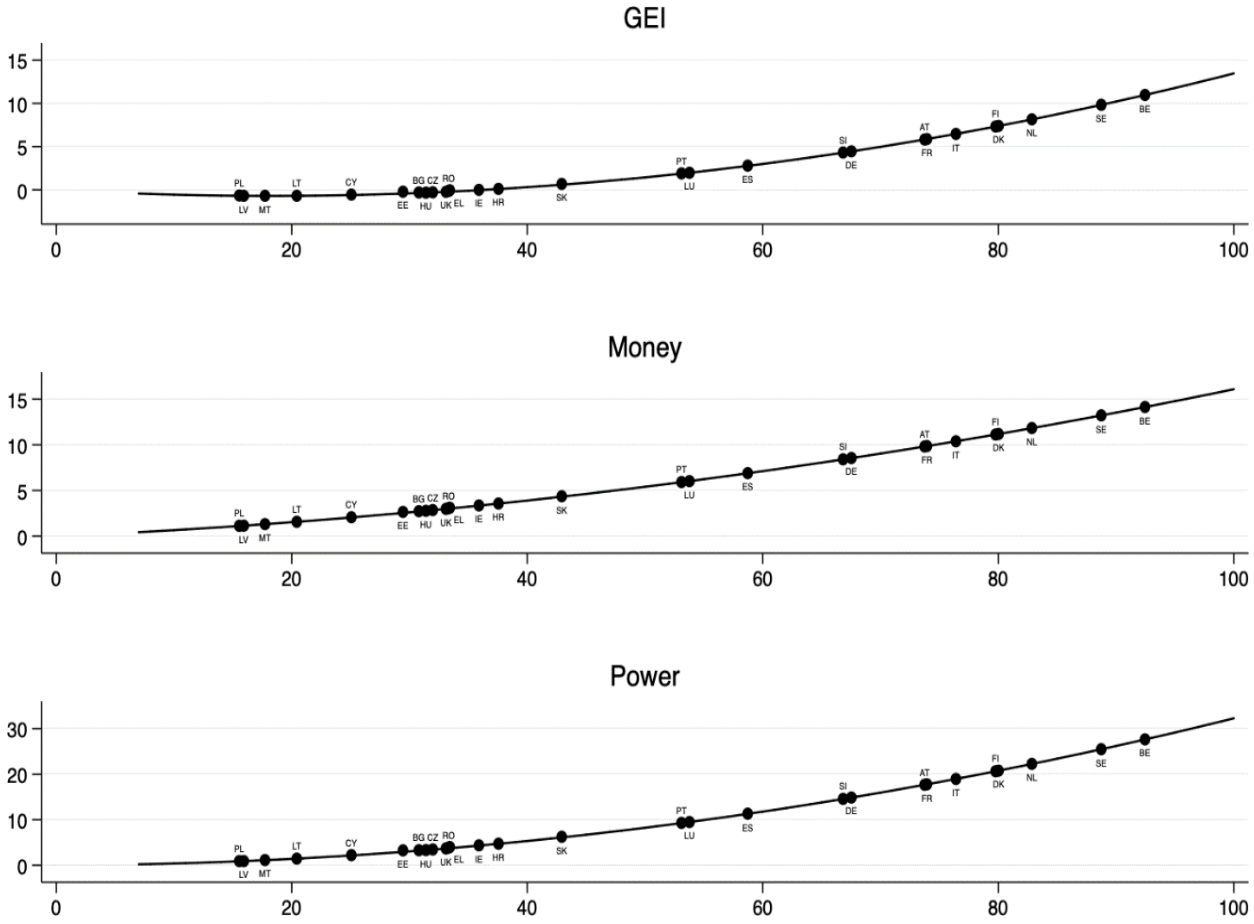
	GEI		Work		Money		Know		Time		Power		Health	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
IR														
IR	0.13†	-0.05	-0.02	-0.13	0.12†	-0.02	0.06	-0.24	0.14*	-0.35	0.35†	0.04	0.05*	0.04
	(0.03)	(0.13)	(0.02)	(0.1)	(0.03)	(0.15)	(0.04)	(0.17)	(0.07)	(0.37)	(0.07)	(0.27)	(0.03)	(0.12)
IR^2	-	0	-	0	-	0	-	0*	-	0	-	0	-	0
	-	(0.00)	-	(0.00)	-	(0.00)	-	(0.00)	-	(0.00)	-	(0.00)	-	(0.00)
ΔUD	-0.01	-0.01	0.06*	0.06*	-0.01	-0.02	-0.02	-0.02	0.14	0.15	0.01	0.02	0.04	0.04
	(0.05)	(0.05)	(0.03)	(0.04)	(0.07)	(0.07)	(0.04)	(0.04)	(0.09)	(0.09)	(0.13)	(0.13)	(0.06)	(0.06)
Economic														
GDP pcap	0.1‡	0.14‡	0.01	0.03	0.24†	0.24†	0.09‡	0.16†	0.21*	0.32†	0.03	0.12	0.07*	0.07*
	(0.05)	(0.06)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.11)	(0.12)	(0.14)	(0.17)	(0.04)	(0.04)
Δlfp	-	-	0.34†	0.35†	-	-	0.44†	0.37†	-	-	-	-	-	-
	-	-	(0.1)	(0.1)	-	-	(0.12)	(0.1)	-	-	-	-	-	-
Δu	-	-	-	-	-	-	-0.24	-0.15	-	-	-	-	0.2	0.21
	-	-	-	-	-	-	(0.28)	(0.26)	-	-	-	-	(0.32)	(0.32)
Δtemp	-0.11	-0.09	-	-	-	-	-	-	-	-	-0.2	-0.17	-	-
	(0.23)	(0.22)	-	-	-	-	-	-	-	-	(0.45)	(0.46)	-	-
Pers. Charac.														
Δeduc 0Y-2Y	0.32	0.24	-	-	-	-	-	-	-	-	-	-	-	-
	(0.32)	(0.29)	-	-	-	-	-	-	-	-	-	-	-	-
Δeduc 5Y-8Y	0.11	0.07	-0.04	-0.06	-	-	0.02	-0.01	0.5	0.46	-	-	-0.04	-0.04
	(0.2)	(0.19)	(0.13)	(0.12)	-	-	(0.16)	(0.15)	(0.34)	(0.36)	-	-	(0.12)	(0.12)
Δtenure 2Y-5Y	-	-	-	-	0.4	0.38	-	-	-	-	-	-	0.62‡	0.62‡
	-	-	-	-	(0.4)	(0.39)	-	-	-	-	-	-	(0.27)	(0.26)
Δtenure > 5Y	-	-	-	-	-	-	-	-	-0.32	-0.31	-	-	-	-
	-	-	-	-	-	-	-	-	(0.35)	(0.31)	-	-	-	-
Soc. Exp														
CDC - gdp pc.	-	-	-	-	1.07	1.1	-	-	-	-	-	-	-	-
	-	-	-	-	(1.67)	(1.68)	-	-	-	-	-	-	-	-
FCA - gdp pc.	3.56*	3.98‡	3.93†	3.94†	-	-	-	-	-	-	10.99*	12‡	3.48*	3.45*
	(2.03)	(1.9)	(1.42)	(1.5)	-	-	-	-	-	-	(6.01)	(5.99)	(1.86)	(1.84)
Sect. shares														
B-F	0.02	0.08	-	-	-	-	0.24*	0.32‡	0.23	0.33	-0.29	-0.23	-	-
	(0.14)	(0.13)	-	-	-	-	(0.13)	(0.13)	(0.36)	(0.31)	(0.38)	(0.36)	-	-
G-N	-	-	-	-	0.2	0.17	-	-	-	-	-	-	0.32	0.32
	-	-	-	-	(0.21)	(0.2)	-	-	-	-	-	-	(0.2)	(0.2)
O	-0.42	-0.3	-	-	-	-	0.74*	0.84‡	-	-	-0.55	-0.41	-0.06	-0.07
	(0.4)	(0.4)	-	-	-	-	(0.39)	(0.35)	-	-	(1.15)	(1.17)	(0.48)	(0.48)
P-U	0.74†	0.59‡	0.38‡	0.28	-	-	1.01†	0.8†	0.97*	0.62	0.8	0.56	-	-
	(0.26)	(0.26)	(0.16)	(0.18)	-	-	(0.18)	(0.2)	(0.56)	(0.65)	(0.56)	(0.68)	-	-
Occ.shares														
1	0.59†	0.58†	0.34†	0.32†	0.32	0.26	0.18	0.18	0.83‡	0.8‡	-	-	0.34	0.33
	(0.18)	(0.18)	(0.13)	(0.12)	(0.21)	(0.21)	(0.16)	(0.15)	(0.42)	(0.4)	-	-	(0.22)	(0.21)
2	-	-	-	-	-	-	-	-	-	-	-0.77	-0.92	-	-
	-	-	-	-	-	-	-	-	-	-	(0.54)	(0.56)	-	-
3	-	-	-	-	0.33‡	0.32‡	-	-	-	-	-0.71	-0.82	-	-
	-	-	-	-	(0.13)	(0.14)	-	-	-	-	(0.57)	(0.56)	-	-
4	0.42‡	0.42‡	-	-	0.56‡	0.61‡	0.48‡	0.43†	-	-	-1.98‡	-2‡	0.32	0.33
	(0.18)	(0.17)	-	-	(0.28)	(0.29)	(0.19)	(0.16)	-	-	(0.82)	(0.83)	(0.21)	(0.22)
5	0.39‡	0.45‡	-	-	-	-	0.44‡	0.56†	-0.09	0.07	-	-	-	-
	(0.19)	(0.18)	-	-	-	-	(0.21)	(0.15)	(0.41)	(0.37)	-	-	-	-
F-test	-	0.00	-	.42	-	0.00	-	.02	-	.2	-	0.00	-	.19
U-test	-	.41	-	.19	-	.5	-	.1	-	.19	-	-	-	-
Shape	-	U	-	U	-	U	-	U	-	U	-	-	-	-

† p<0.01, ‡ p<0.05, * p<0.1

Notes: Estimates for year indicator variables are not reported. Clustered standard errors at the country level in parentheses.

- Non-linear effects of Industrial Relation – illustration

Figure 6. Non-linear effects from random effects estimation - EIGE indices



Source: Author own computations.

Note: Non-linear effects, $\gamma_2 IR_i + \gamma_3 IR_i^2$ from RE estimation. The figure displays EU countries based on their average IR index in the sample and displayed in Table 4.

A.5. Descriptive statistics – Structure of Earnings Survey

Table 18. Structure of Earnings Survey descriptive statistics – full sample

	Age				Tenure			EDUC		Size	
	20-29	30-39	40-49	50-59	1Y-5Y	6Y-14Y	GT-15Y	1	3	LT50	GT50
BE	18.1	27.5	28.6	23.0	33.5	28.3	26.9	21.4	37.8	20.9	78.8
BG	16.2	25.0	26.1	24.2	44.1	22.3	11.0	7.5	32.1	42.9	56.4
CZ	19.2	26.3	26.2	22.3	39.3	29.1	16.1	9.0	17.7	34.5	65.5
DE	15.8	22.2	27.4	25.6	37.1	27.4	26.9	11.9	18.6	32.4	67.6
DK	18.3	22.6	24.8	23.8	33.4	26.0	15.6	11.5	45.6	21.7	78.3
EE	16.5	22.6	24.1	23.6	40.1	28.9	14.9	8.9	39.8	41.0	59.0
EL	14.5	32.2	31.6	19.2	29.5	29.4	22.3	16.0	38.7	30.9	69.1
ES	17.2	31.7	28.1	18.3	33.8	27.6	19.1	46.7	32.7	41.7	48.3
FI	15.8	24.3	26.5	26.3	32.2	28.1	26.0	10.9	44.7	19.2	80.8
FR	15.2	27.3	29.0	23.9	31.0	30.7	31.1	19.1	39.2	22.0	78.0
HR	13.8	28.9	27.0	24.7	32.8	28.4	25.0	10.7	33.3	30.0	70.0
HU	16.0	27.1	27.6	23.9	39.4	26.2	16.0	12.9	25.3	39.4	60.6
IT	10.2	26.8	32.9	25.3	30.3	31.8	28.1	34.6	21.1	26.6	73.3
LT	18.1	23.3	27.8	23.0	38.4	25.6	14.9	4.4	46.6	39.3	60.7
LV	17.2	22.9	25.3	23.5	43.7	25.8	11.1	7.8	38.5	41.2	50.3
NL	22.8	23.8	25.1	21.6	34.3	36.9	20.5	20.8	34.3	30.9	69.1
PL	18.5	28.9	27.3	21.9	36.5	29.6	24.1	12.8	35.1	28.5	71.5
PT	19.1	31.8	27.5	17.9	34.1	31.2	23.4	53.6	24.7	30.3	69.7
RO	15.6	28.6	30.8	21.8	43.1	28.1	17.6	8.1	29.9	18.6	81.4
SE	17.4	23.4	26.1	23.6	39.8	30.2	22.1	9.6	40.6	18.9	81.1
SI	13.5	29.3	29.9	24.8	33.1	28.1	23.2	9.9	32.2	37.8	62.2
SK	16.2	25.4	27.3	25.6	37.9	30.9	17.8	8.1	25.4	30.2	69.8
	Industry				Occupation			Own		Contract	
	B-F	G-J	K-N	Q	1-3	5-9	4-7-8	Pub	Priv	PT	temp
BE	25.8	27.0	19.1	17.8	38.4	27.4	34.1	10.4	77.5	24.3	6.5
BG	37.0	32.7	11.7	6.6	30.3	33.0	36.7	20.5	69.3	9.1	9.1
CZ	41.5	27.4	13.2	7.5	38.1	19.7	42.1	19.6	80.4	5.3	19.6
DE	29.9	26.6	18.1	14.1	35.9	25.4	37.6	10.7	69.0	37.6	11.5
DK	17.3	23.4	19.4	26.1	48.6	30.1	21.3	37.6	62.4	26.4	4.1
EE	31.6	29.3	13.4	8.5	43.2	24.5	32.3	25.5	73.3	15.8	5.3
EL	22.3	39.9	12.2	8.5	33.7	29.4	31.3	24.3	75.7	10.8	16.4
ES	26.4	35.6	17.8	10.0	31.0	33.4	35.6	10.0	90.0	21.5	23.3
FI	26.4	25.0	14.3	21.4	45.8	27.6	26.7	35.3	64.7	12.5	12.3
FR	24.0	28.3	19.1	17.0	46.2	22.3	31.5	21.2	78.8	18.6	7.9
HR	32.6	29.2	10.7	9.0	38.1	28.4	33.5	38.6	61.4	4.1	15.5
HU	32.2	30.6	12.8	8.9	39.9	22.1	38.0	28.2	71.8	12.1	5.3
IT	33.6	26.0	15.4	11.0	33.5	21.3	45.2	26.1	73.9	14.6	9.2
LT	30.3	31.9	10.6	9.4	47.8	21.0	31.2	30.1	69.9	18.0	5.2
LV	25.3	35.0	14.0	7.3	45.4	26.2	28.4	30.3	69.7	28.2	5.3
NL	17.1	28.1	24.2	19.0	45.3	26.1	26.7	27.8	72.2	51.2	21.7
PL	38.0	25.3	11.5	8.4	43.8	19.0	37.2	33.1	66.9	8.3	27.7
PT	31.9	26.3	15.6	11.7	31.7	30.1	38.2	18.8	81.2	5.3	24.0
RO	43.9	25.7	11.2	7.5	34.4	26.1	39.5	26.3	73.7	2.9	2.4
SE	22.6	22.1	13.4	28.0	45.8	28.5	25.7	39.3	60.7	25.3	4.1
SI	36.4	28.7	14.0	8.4	41.4	24.3	34.3	28.0	72.0	3.7	22.5
SK	37.2	27.5	12.7	8.3	40.6	19.8	39.6	23.5	76.5	7.3	15.4

Source: SES based on author's own computations.

Notes: See notes at the bottom of Table 8 for information on each column. One category is left out for each variable except for occupations. Blue (red) cells inform on high (low) percentages across countries (per column).

A.6. Decomposition results

- Detailed decomposition - Oaxaca-Blinder

Table 19. Detailed results – Oaxaca-Blinder decomposition – 2006-2010

	2006																			
		Size		Ownership		age		educ		tenure		PT		contract		occupation		industry		cons.
	GPG	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(2)
BE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BG	6.9	0.2	1.2	-1.1	-2.7	0.0	-2.8	-2.4	-1.5	-1.7	3.9	0.1	-0.2	0.0	0.2	-1.9	-1.2	4.3	-6.5	19.3
CZ	19.1	-0.2	6.4	-0.1	1.0	-0.2	3.5	0.3	0.7	0.0	3.5	0.4	0.1	0.3	-0.2	-2.1	-0.2	2.6	-1.3	4.6
DE	19.9	-0.1	1.6	0.0	0.6	0.1	1.5	0.9	1.2	0.3	2.7	2.0	-0.9	0.1	-0.4	-3.8	-3.2	5.9	-7.2	18.8
DK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EE	29.0	-1.6	1.1	1.3	-4.5	0.2	-3.1	-1.1	0.1	-0.1	4.0	1.6	-2.3	-0.1	0.3	2.0	-1.3	3.3	-8.8	37.9
EL	18.0	-0.4	1.8	0.1	1.9	2.7	5.8	0.1	-1.6	1.5	0.4	-0.6	0.8	-0.1	0.5	2.4	-7.6	1.1	-3.1	12.2
ES	15.1	-1.5	2.4	-0.6	10.4	0.7	1.1	-2.3	0.9	0.7	1.7	0.8	-0.9	-0.2	-0.3	-0.2	0.8	1.9	-2.3	1.9
FI	19.8	-0.4	1.2	2.0	1.1	-0.5	5.3	-1.4	0.0	0.1	0.5	0.1	-0.3	0.4	-0.4	2.8	-4.4	2.1	0.5	11.2
FR	10.8	-0.2	1.1	-0.2	-4.7	0.1	3.6	-1.5	0.3	0.2	2.0	0.3	0.1	0.2	-0.1	-0.6	-2.4	2.1	-0.8	11.3
HR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HU	4.1	-0.7	11.5	-1.3	-1.1	-0.1	-1.3	-2.8	0.5	-1.3	6.5	-0.8	-0.8	0.0	0.1	-2.4	-1.5	4.3	-4.1	-0.6
IT	3.5	-0.9	-0.4	-2.0	-1.9	0.3	4.5	-4.4	1.2	-0.2	-0.9	2.1	-1.3	0.2	-0.3	-3.8	-0.7	0.3	-2.1	13.7
LT	9.8	-2.2	6.0	-1.1	-0.7	0.1	-3.2	-2.9	0.4	-2.7	5.8	1.5	-3.1	0.0	0.4	-3.1	2.1	5.1	-14.5	22.1
LV	7.0	-3.9	5.4	-1.3	-3.3	0.5	-0.6	-2.9	-5.3	-2.0	3.3	0.4	-0.9	0.0	-0.2	-1.2	4.3	4.8	-7.8	17.6
NL	15.9	-0.2	1.2	2.7	4.3	1.0	8.5	-0.6	0.1	0.3	-0.7	4.2	-3.0	0.1	-0.7	-0.2	-3.1	0.3	-1.3	3.1
PL	4.1	1.9	7.9	-2.0	-0.6	-0.5	-3.9	-6.1	-4.8	-1.1	1.2	0.3	-1.0	-0.3	-1.1	-3.9	-0.5	3.4	-8.1	23.1
PT	7.0	-1.6	4.1	-2.6	3.6	0.3	2.3	-6.1	-1.1	-0.7	-0.3	-0.1	-0.6	-0.1	-0.8	-0.9	-1.4	1.8	-3.5	14.6
RO	5.5	-0.6	1.0	-2.7	-6.1	0.1	-3.0	-2.3	0.0	-1.1	3.8	0.1	-0.2	0.0	0.2	-3.2	0.5	4.6	-8.5	23.0
SE	13.1	-0.5	0.4	2.6	0.6	-0.5	1.4	-1.1	-1.2	-0.4	0.9	1.1	-0.6	0.0	0.0	0.8	-6.3	4.8	-2.6	13.8
SI	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SK	21.3	-0.8	7.3	-0.5	-0.2	-0.4	-0.2	0.4	3.3	-0.3	4.6	0.6	-0.4	-0.1	-0.3	-2.0	-0.4	6.0	-4.1	8.8
	2010																			
		size		ownership		age		educ		tenure		PT		contract		occupation		industry		cons
	GPG	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(2)
BE	8.0	-0.3	1.5	-0.5	-1.0	0.3	2.0	-3.6	0.4	0.2	-1.5	2.9	-0.2	0.1	-0.3	-1.2	-0.7	3.6	-5.3	11.6
BG	7.8	1.3	0.4	-0.5	-4.7	-0.1	-1.0	-2.5	-3.8	-1.3	2.5	0.1	-0.3	0.0	0.2	-0.8	-4.9	3.9	-8.8	28.3
CZ	14.8	-0.1	4.5	-0.8	-0.2	0.0	2.6	0.0	2.8	0.1	2.9	0.4	-0.1	0.3	0.0	-0.7	-0.7	2.5	-5.5	6.8
DE	20.3	-0.1	1.0	-0.2	1.7	0.0	0.5	1.3	-2.7	0.3	1.2	5.0	-2.3	0.1	-0.3	-1.0	-7.5	6.9	-8.1	24.5
DK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EE	22.2	-1.9	3.3	-0.1	-6.9	1.2	-0.6	-1.9	-0.3	-0.9	4.3	1.8	-1.7	0.1	0.5	2.2	0.1	3.9	-10.4	29.5
EL	11.3	0.5	6.6	-1.2	-4.9	1.4	4.4	-1.5	-0.8	0.7	-1.0	0.4	-0.4	0.1	-0.7	0.7	-1.9	2.1	-4.9	11.9
ES	14.8	-0.8	2.9	-0.7	5.6	0.6	2.6	-1.9	1.7	1.2	1.3	0.6	-0.3	0.0	-0.6	1.6	1.3	1.6	-3.7	1.9
FI	18.7	-0.6	0.6	2.2	0.8	-0.6	5.1	-1.6	-0.4	0.3	-0.3	-0.1	0.2	0.4	-0.5	3.6	-3.6	1.9	0.1	11.2
FR	11.5	-0.1	-0.3	-0.9	-4.2	0.1	2.4	-1.6	1.0	0.0	1.7	-0.3	1.0	0.1	-0.1	0.9	-2.8	3.7	-1.2	12.1
HR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HU	6.7	-2.0	9.9	-0.2	0.3	0.0	1.6	-2.6	0.7	-0.7	5.3	-1.2	-1.0	0.0	0.0	-1.4	-1.0	5.6	-6.7	0.0
IT	3.1	-0.8	1.5	-1.4	6.6	-0.1	3.4	-3.9	1.2	-0.2	3.1	2.3	-0.4	0.1	-0.3	-2.8	3.3	1.2	2.6	-12.2
LT	6.6	-1.1	5.7	-1.6	-4.8	0.1	-1.2	-2.6	1.2	-3.1	8.6	1.1	-2.6	0.0	0.0	-3.9	-0.1	3.3	-10.9	18.4
LV	5.7	-4.2	7.1	-1.7	-6.9	0.6	-0.9	-2.7	-1.4	-1.6	3.3	0.5	-1.9	0.1	-0.4	-0.2	2.5	5.6	-7.7	15.7
NL	14.2	-0.3	-0.9	1.4	4.3	0.5	4.6	-0.7	-1.2	0.3	2.4	4.3	-3.3	-0.1	-0.6	1.9	-3.3	0.0	-2.8	7.4
PL	1.7	1.4	7.7	-2.3	-0.4	-0.5	-3.7	-5.1	-3.4	-0.8	0.3	0.0	-0.6	-0.3	-1.8	-4.3	1.3	4.0	-9.3	19.4
PT	9.6	-0.9	3.4	-2.2	-1.3	-0.1	2.6	-6.5	0.2	0.0	4.6	-0.1	-0.2	-0.3	-0.7	0.7	3.4	3.8	-8.1	11.4
RO	6.3	-0.7	0.6	-2.7	-12.6	0.1	-3.2	-4.1	2.0	-0.9	4.4	0.1	-0.1	0.0	0.2	-2.6	1.8	10.4	-12.9	26.6
SE	12.4	-0.4	-0.3	2.3	0.2	-0.4	1.4	-1.8	-0.2	-0.3	-0.5	0.9	-0.4	0.0	0.0	0.7	-5.2	5.2	-1.6	12.7
SI	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SK	14.9	-0.2	3.4	0.2	0.0	-0.3	1.7	-1.1	8.4	-0.4	5.1	0.5	-0.3	0.0	0.7	-3.2	0.5	4.9	-6.3	1.4

Source: SES based on author's own computations.

Notes: Detailed decomposition results from OB method. The table displays the explained (1) and unexplained (2) contributions for all the variable used in the analysis. Contributions are expressed in (percentage) points. The column GPG should be equal to the sum of all the other columns.

Table 20. Detailed results – Oaxaca-Blinder decomposition – 2014-2018

	2014																			
		size		ownership		age		educ		tenure		PT		contract		occupation		industry		cons
	GPG	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(2)
BE	4.6	-0.1	-1.2	-0.4	0.0	0.0	3.7	-0.9	2.9	0.1	-0.8	1.2	0.0	0.0	-0.1	1.0	1.8	1.4	-0.1	-4.0
BG	5.8	1.0	1.9	-1.1	-7.7	0.0	-1.9	-2.6	0.4	-1.2	2.3	0.1	-0.2	0.0	0.2	-2.4	-3.4	4.1	-10.7	27.0
CZ	16.3	0.5	5.8	-0.9	-1.5	-0.1	0.4	-0.4	2.6	0.1	3.0	0.3	-0.3	0.2	-0.1	-0.5	-1.7	3.8	-6.4	11.3
DE	20.4	0.9	0.1	0.0	2.4	-0.1	-0.7	1.5	4.1	0.4	2.6	8.5	-7.1	0.2	-0.4	-0.4	-4.0	4.2	-7.6	15.8
DK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EE	21.5	-2.5	4.7	0.0	-7.5	1.3	1.2	-2.3	1.2	-0.7	3.5	0.9	-1.9	0.0	0.2	2.2	2.9	5.6	-9.9	22.8
EL	8.7	0.2	5.3	-1.1	-2.8	1.0	5.4	-2.1	-1.8	-0.3	-4.2	1.0	-0.4	0.0	-0.5	0.7	0.1	2.6	-6.5	11.9
ES	12.8	-0.6	3.2	-0.7	3.1	0.4	2.9	-1.7	2.2	0.7	1.1	0.7	0.0	0.1	-0.9	1.1	2.1	2.4	-6.1	3.1
FI	16.2	-0.6	1.4	0.8	-0.3	-0.6	6.1	-1.6	-0.5	0.1	-0.1	-0.1	0.1	0.1	-0.5	3.2	-3.7	3.4	1.1	7.9
FR	12.0	-0.1	0.4	-0.8	-2.7	0.2	4.5	-1.8	0.4	0.2	1.7	0.2	0.5	0.4	0.0	0.3	-2.0	4.4	-1.6	7.6
HR	4.5	-0.1	3.3	-1.2	-0.3	-0.4	2.4	-6.0	3.1	-0.6	2.6	0.1	-0.3	-0.1	-0.5	-3.9	2.2	2.6	-0.9	2.5
HU	3.3	-2.1	8.7	0.6	-2.5	-0.1	1.0	-2.8	1.6	-0.5	0.9	-2.8	-0.5	0.1	0.0	-4.4	0.3	5.7	-5.6	5.8
IT	2.9	-0.7	-0.2	-1.5	4.0	-0.6	2.9	-4.0	1.3	0.3	-1.5	3.4	-2.3	0.1	-0.5	-2.6	2.5	1.3	-0.3	1.3
LT	4.6	-2.6	2.8	-1.4	-6.7	0.1	0.6	-2.3	-2.0	-2.2	5.3	0.7	-3.5	0.0	0.4	-1.9	-0.3	3.0	-10.5	25.3
LV	10.7	-5.3	9.9	0.3	-3.8	1.1	-1.4	-3.1	-4.0	-1.5	2.1	0.0	-1.6	0.2	0.0	-0.7	0.4	7.6	-11.3	22.0
NL	13.2	-0.4	-1.0	2.2	6.0	0.9	7.1	-0.5	-1.1	0.3	-1.7	4.8	-1.9	0.1	-1.1	1.6	-4.0	-1.7	-0.9	4.5
PL	5.8	1.1	6.4	-2.1	-1.1	-0.5	-4.4	-5.3	1.4	-0.7	-0.4	0.0	-0.6	-0.2	-1.4	-3.7	0.1	5.1	-8.7	20.8
PT	10.9	-1.0	2.6	-1.0	-0.3	0.0	2.3	-5.3	0.3	0.2	3.9	-0.2	0.4	-0.2	-0.6	1.3	4.5	3.6	-7.1	7.5
RO	0.0	-1.7	2.2	-1.8	-7.6	0.1	-2.2	-5.3	1.6	-1.3	0.9	0.2	-0.4	0.0	0.2	-2.8	1.2	6.9	-8.5	18.4
SE	11.2	-0.5	0.0	1.8	-0.4	-0.4	1.0	-1.5	-2.3	-0.2	0.7	0.6	0.0	0.0	0.0	0.8	-5.2	5.2	-1.1	12.4
SI	0.9	-1.4	3.2	-2.1	-2.8	-0.2	-2.5	-4.6	-1.8	-1.7	1.4	0.4	-0.4	-0.4	-0.1	-3.0	1.2	3.4	-1.0	13.3
SK	14.9	0.1	5.6	0.5	0.6	-0.1	-1.2	-1.6	8.5	-0.4	5.8	0.7	-0.6	0.0	0.3	-1.8	1.1	5.1	-6.8	-0.9
	2018																			
		size		ownership		age		educ		tenure		PT		contract		occupation		industry		cons
	GPG	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(2)
BE	6.6	-0.1	0.4	-0.9	-2.2	0.7	0.8	0.7	2.7	0.0	-0.3	3.4	0.6	0.0	0.0	1.8	2.5	0.7	-4.7	0.5
BG	6.8	1.2	1.8	0.3	-3.1	0.1	-2.9	-3.2	0.3	-0.7	0.2	0.4	-0.7	0.0	0.1	-2.3	-3.7	3.2	-8.7	24.5
CZ	14.5	0.4	6.6	-0.5	0.2	-0.1	0.8	-0.8	2.7	0.3	3.3	0.5	-0.6	0.3	-0.1	0.6	-1.9	3.0	-4.7	4.5
DE	17.8	0.7	0.3	0.1	1.5	0.0	-1.5	1.4	2.9	0.2	3.2	7.3	-5.5	0.3	-0.5	-0.5	-4.0	3.9	-6.1	14.3
DK	12.2	-0.5	-0.6	2.2	-0.6	-0.2	0.8	-1.1	-1.7	-0.5	1.3	0.0	-0.6	0.0	-0.6	-0.5	-4.1	4.6	-4.2	18.6
EE	16.9	-2.1	4.2	-0.4	-4.9	2.0	0.3	-2.5	2.2	-0.5	1.6	1.2	-2.2	0.0	0.0	1.0	1.3	3.8	-7.3	19.3
EL	4.9	0.2	1.3	-0.5	7.4	0.4	3.8	-2.1	0.2	-1.4	2.9	0.8	-1.2	-0.1	0.2	-1.7	-5.9	1.9	-5.3	4.0
ES	11.4	-0.4	1.5	-1.0	5.4	0.1	2.7	-2.1	1.9	-0.4	2.9	0.0	0.5	0.0	-0.6	0.7	2.0	2.8	-3.4	-1.5
FI	15.2	-0.3	1.2	0.9	-0.1	-0.5	5.6	-1.9	-0.5	0.0	0.5	0.2	0.0	0.2	-0.4	1.2	-4.0	4.9	1.8	6.6
FR	12.7	0.0	-1.1	-0.3	0.8	0.1	2.3	-1.9	-0.6	0.0	3.6	0.4	0.3	0.2	0.3	0.4	-3.4	4.2	-0.9	8.3
HR	9.4	-0.6	2.7	-0.5	1.3	-0.3	1.4	-4.4	1.1	-0.8	3.8	0.1	-0.2	0.1	-0.1	-1.2	3.6	2.3	-2.7	3.8
HU	5.7	-1.8	6.2	0.2	-2.9	0.0	-1.0	-4.8	1.0	-0.4	2.4	0.6	-0.8	0.1	0.1	-5.1	-4.0	5.9	-8.6	18.6
IT	1.4	-0.8	0.7	-1.3	5.8	-0.7	3.7	-3.8	0.6	-0.2	0.4	2.5	-1.2	0.0	-0.2	-2.9	0.6	1.1	1.3	-4.2
LT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LV	14.3	-2.9	8.1	2.1	-2.4	1.3	-0.4	-3.2	-1.8	-0.8	1.8	0.0	-0.4	0.0	0.0	-1.2	-0.6	4.2	-5.3	15.9
NL	12.4	-0.2	-0.6	2.5	7.4	0.4	4.8	-1.1	-1.8	0.1	1.9	4.9	-1.2	0.0	-0.6	1.1	-3.2	-1.8	0.4	-0.6
PL	6.2	0.9	4.6	-1.4	-0.2	-0.4	-4.2	-5.3	1.0	-0.4	-1.6	0.0	-0.5	0.3	-1.0	-3.2	-0.4	5.2	-9.1	21.7
PT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RO	0.3	-1.6	3.0	-1.3	-1.2	-0.1	-5.2	-4.4	2.2	-0.9	2.2	0.1	-0.1	0.0	0.3	-2.9	0.1	1.5	-6.3	14.9
SE	9.6	-0.4	-1.1	1.7	0.1	-0.5	1.0	-1.6	-1.7	-0.3	2.2	0.5	-0.4	0.1	0.5	-0.2	-4.0	4.9	-0.3	9.2
SI	4.3	-1.5	2.5	-1.6	-3.1	-0.1	-4.4	-5.4	-0.8	-1.5	1.4	0.6	-0.7	-0.1	-0.7	-2.2	1.5	3.8	-2.4	19.1
SK	15.5	-0.3	6.5	0.9	1.3	0.1	-1.4	-1.6	10.9	-0.1	1.4	0.5	-0.6	0.1	0.3	-0.2	-0.3	4.9	-6.7	0.0

Source: SES based on author's own computations.

Notes: Detailed decomposition results from OB method. The table displays the explained (1) and unexplained (2) contributions for all the variable used in the analysis. Contributions are expressed in (percentage) points. The column GPG should be equal to the sum of all the other columns.

- Ñopo-matching

Table 21. Detailed results – Ñopo matching

	2006							2010						
	GPG	Matched %		Delta				GPG	Matched %		Delta			
		M	F	M	X	O	F		M	F	M	X	O	F
BE	-	-	-	-	-	-	-	7.6	94.6	92.8	-0.4	1.7	5.7	0.6
BG	10.0	95.5	96.8	-0.4	-3.5	13.8	0.2	10.4	94.9	95.8	-0.7	-1.4	11.9	0.5
CZ	18.4	96.9	96.3	-0.5	2.3	16.4	0.1	15.0	96.4	95.7	-0.8	0.7	14.6	0.5
DE	19.3	98.9	98.6	-0.2	8.1	11.3	0.1	19.9	99.1	99.0	-0.2	11.9	8.2	0.1
DK	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EE	26.2	93.5	90.9	-1.5	4.2	22.1	1.3	21.1	92.4	90.8	-1.3	2.5	18.5	1.4
EL	18.3	80.6	89.4	1.7	8.3	7.9	0.5	12.1	88.6	92.0	-0.8	5.0	6.6	1.2
ES	13.8	95.2	93.7	0.0	-0.5	13.5	0.7	13.5	93.4	93.3	-0.6	1.9	11.4	0.8
FI	18.9	96.5	94.5	-0.6	3.5	15.6	0.4	17.7	96.6	94.8	-0.6	3.2	14.6	0.5
FR	11.9	93.9	89.2	-1.2	-0.3	11.6	1.8	12.4	95.0	91.8	-1.0	2.1	10.1	1.1
HR	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HU	8.3	96.8	97.0	-0.4	-2.2	10.8	0.1	9.5	96.8	97.2	-0.6	-0.8	10.8	0.1
IT	2.2	95.1	94.2	-0.3	-11.5	12.8	1.2	1.9	96.9	96.7	-0.4	-8.4	10.0	0.7
LT	11.9	94.2	93.1	-1.6	-5.8	18.1	1.3	7.5	83.1	86.1	-5.2	-10.0	19.4	3.3
LV	9.6	96.2	95.8	-0.7	-5.5	15.4	0.5	8.3	94.1	94.8	-1.3	-6.4	15.2	0.8
NL	16.9	86.1	88.4	-1.3	8.8	8.9	0.6	15.3	94.8	96.2	-0.7	7.3	8.3	0.3
PL	2.1	97.5	98.0	-0.6	-9.7	11.9	0.5	-0.3	97.8	98.3	-0.5	-11.2	10.9	0.5
PT	4.0	93.9	94.8	0.0	-13.0	16.1	0.9	7.5	95.3	95.2	-0.2	-6.1	12.9	0.9
RO	6.2	98.1	98.5	-0.3	-5.4	11.7	0.2	7.5	98.5	98.7	-0.2	-0.6	8.2	0.2
SE	13.7	97.0	96.5	-0.4	5.4	8.5	0.2	12.8	97.1	97.4	-0.4	5.1	7.8	0.2
SI	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SK	20.9	95.5	96.0	-1.0	4.3	17.2	0.5	15.4	95.4	96.0	-1.1	0.5	15.5	0.5

-	2014							2018						
	GPG	Matched %		Delta				GPG	Matched %		Delta			
		M	F	M	X	O	F		M	F	M	X	O	F
BE	4.9	95.7	93.9	-0.5	3.2	1.7	0.5	5.6	98.0	95.8	-0.3	4.6	0.7	0.6
BG	9.6	93.3	95.6	-1.1	-3.0	13.1	0.6	10.9	94.4	95.3	-1.5	-1.3	13.0	0.7
CZ	16.9	97.6	97.1	-0.6	1.7	15.6	0.3	15.2	98.3	97.6	-0.4	2.0	13.3	0.3
DE	20.5	97.8	97.9	-0.5	14.6	6.3	0.1	18.5	97.2	97.7	-0.6	13.7	5.2	0.1
DK	-	-	-	-	-	-	-	12.6	99.3	99.7	-0.1	4.0	8.7	0.0
EE	21.1	93.2	90.3	-1.0	0.9	19.7	1.5	16.8	93.6	91.3	-1.3	-0.6	17.6	1.2
EL	9.8	87.7	93.2	-1.6	4.2	5.8	1.4	6.2	85.1	91.6	-2.1	-2.5	9.0	1.8
ES	12.1	91.8	92.7	-1.3	3.0	9.3	1.0	10.6	93.0	93.4	-1.1	0.1	10.5	1.0
FI	15.7	95.2	95.2	-0.9	3.0	13.1	0.4	15.0	95.9	95.7	-0.7	2.9	12.3	0.5
FR	12.4	95.2	92.4	-0.9	1.9	10.2	1.3	13.0	94.4	91.2	-1.3	1.5	11.1	1.6
HR	5.8	88.6	92.0	-1.5	-7.7	13.8	1.2	9.0	91.6	93.8	-1.3	-5.3	14.7	1.0
HU	6.2	97.8	97.0	-0.2	-3.6	10.2	-	8.8	96.4	97.2	-0.7	-4.1	13.2	0.5
IT	2.0	94.9	95.3	-0.9	-8.8	10.6	1.0	1.3	93.9	97.0	-1.0	-8.4	10.0	0.7
LT	6.8	87.5	89.0	-2.9	-5.1	13.4	1.3	-	-	-	-	-	-	-
LV	12.7	88.9	91.8	-1.4	-1.8	15.3	0.7	14.9	92.3	94.2	-1.5	-1.2	16.8	0.7
NL	15.0	88.0	92.4	-2.1	8.6	7.7	0.7	13.6	88.4	91.7	-1.9	7.0	7.7	0.9
PL	4.4	97.3	98.4	-0.8	-8.3	13.0	0.5	5.9	97.4	98.7	-0.6	-6.5	12.7	0.4
PT	9.6	92.4	94.9	-0.9	-1.6	11.2	0.9	-	-	-	-	-	-	-
RO	2.4	98.1	98.8	-0.4	-6.4	9.0	0.2	1.2	98.6	98.9	-0.3	-13.3	14.5	0.2
SE	11.6	96.9	97.6	-0.4	5.0	6.8	0.1	9.9	95.4	96.2	-0.6	3.4	6.7	0.5
SI	1.4	90.3	92.0	-1.9	-10.7	12.5	1.4	4.9	89.9	92.6	-2.4	-9.0	15.3	1.1
SK	15.4	96.5	96.1	-0.9	1.7	14.0	0.6	15.9	97.0	96.8	-0.8	2.5	13.7	0.5

Source: SES based on author's own computations.

Notes: Detailed decomposition results from exact matching (Ñopo, 2008). The table displays the unadjusted GPG, the percentages of male and female matched, and the four components from the decomposition, where M and F captures the component from observations out of the support for Male and Female. X is the explained part and O the unexplained one. Contributions are expressed in (percentage) points.

A.7. Gender pay gap and IR – random effects

Table 22. Estimation results - gender pay gap - random effects

	Unadj. Δln(w)		Unadj. Δw		Adj. OB		Adj. Ñopo	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
IR	-0.06	0.07	-0.04	0.07	-0.1†	-0.01	-0.09†	-0.15‡
	(0.09)	(0.17)	(0.08)	(0.16)	(0.03)	(0.07)	(0.03)	(0.07)
IR^2	-	0	-	0	-	0	-	0
	-	(0.00)	-	(0.00)	-	(0.00)	-	(0.00)
ΔUD	-0.01	0	-0.01	0	-0.04	-0.03	-0.05	-0.06*
	(0.06)	(0.06)	(0.06)	(0.06)	(0.03)	(0.03)	(0.03)	(0.03)
Δlfp	0.16	0.23	0.11	0.18	-0.01	0.08	-0.03	-0.08
	(0.18)	(0.17)	(0.16)	(0.16)	(0.1)	(0.1)	(0.1)	(0.09)
GDP pcap	6.48‡	8.61†	4.85*	6.69‡	1.95	3.28*	-0.03	-1.04
	(3.08)	(3.06)	(2.56)	(2.95)	(1.52)	(1.93)	(1.54)	(2.24)
SPB – GDP pc.	0.15	-0.25	0.28	-0.08	0.61	0.42	1.5	1.7*
	(0.99)	(0.93)	(0.98)	(0.95)	(0.93)	(0.89)	(1.02)	(1)
FCA – GDP pc.	-0.32	0.37	0.41	0.95	-2.32*	-2.36*	-2.74*	-2.9‡
	(2.41)	(2.31)	(2.44)	(2.3)	(1.34)	(1.21)	(1.42)	(1.46)
2010	-1.58‡	-1.5‡	-1.51‡	-1.44‡	-2.31†	-2.34†	-1.47†	-1.49†
	(0.74)	(0.74)	(0.67)	(0.67)	(0.53)	(0.56)	(0.42)	(0.41)
2014	-3.24†	-3.43†	-2.43†	-2.6†	-3.78†	-4†	-2.44†	-2.32†
	(0.97)	(1.03)	(0.88)	(0.95)	(0.62)	(0.63)	(0.52)	(0.52)
2018	-4.21†	-4.79†	-3.38†	-3.88†	-3.98†	-4.45†	-2.04†	-1.73‡
	(1.35)	(1.49)	(1.16)	(1.39)	(0.81)	(0.83)	(0.56)	(0.69)
F-test	-	0.1	-	0.28	-	0.01	-	0.00
U-test	-	0.4	-	0.37	-	-	-	0.47
Shape	-	I	-	I	-	I	-	U
Int.	-	[8;93]	-	[8;93]	-	[8;93]	-	[8;93]
<0	-	[37;93]	-	[47;93]	-	[8;93]	-	[8;93]
TP	-	18	-	23	-	-	-	88
R_w^2	0.22	0.19	0.18	0.15	0.54	0.49	0.37	0.42
R_b^2	0.29	0.43	0.22	0.34	0.41	0.56	0.51	0.41
BP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hausman	.51	.05	.42	.09	.66	0.00	.16	0.00

† p<0.01, ‡ p<0.05, * p<0.1

Notes: Estimation results for the RE model. For the (adjusted) GPG, the table displays estimated coefficients assuming linear (1) and non-linear (2) effects of IR on the GPG. For the non-linear estimation, the table further shows the p-value from a joint F-test of significativity on the IR index and IR index^2 coefficients, the shape of the relationship tested and the p-value from the U-test (Lind and Mehlum, 2010), the interval of IR index values (Int.), the interval over which the estimated effect is negative (≤ 0) and the turning point (TP). No p-value from the U-test is reported when the extremum lies outside the range of IR values (the relation is monotonic over the range of observed IR index values). The p-values from the Breusch-Pagan LM test (BP) and the cluster robust Hausman test (Hausman) are displayed as well. Clustered standard errors at the country level in parentheses.