

Industrial relations and Gender equality in European Member States

Alexandre Ounnas

Centre for European Policy Studies

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1 Introduction

Introduction

- Industrial relations (IR) systems capture the set of rules/institutions and actors which frame and organise the employment relationship (Kaufman, 2004).
- Actors include Trade Unions (TU), Employers' organisations, ... whereas institutions relate to various councils favouring social dialogue, collective bargaining (CB), ...
- Great variety of IR regimes in Member States (MS) which are important to understand how labour markets function and their outcomes.
- Therefore IR actors and institutions can be key levers to reduce gender gaps in the labour market (Eurofound, 2014) in particular, the Gender Pay Gap (GPG).

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- Great variety of IR regimes in Member States (MS) which are important to understand how labour markets function and their outcomes.
- Therefore IR actors and institutions can be key levers to reduce gender gaps in the labour market (Eurofound, 2014) in particular, the Gender Pay Gap (GPG).
- This work aims to provide additional evidence on the potential association between the GPG and IR in Member States.

Relevant literature

- Substantial literature in comparative IR studies that aims at constructing typologies and indices (Visser, 2009; Meardi, 2018; Metten, 2021).
- Healy et al. (2006) or Williamson and Baird (2014) point that IR studies have long been 'blind' to gender equality issues, in part because of the dominance of the male breadwinner model.
- Literature on determinants of the GPG based on decomposition methods (Blau and Kahn, 2017).
- Analysis of IR and the GPG usually narrow down the IR dimension to TU membership (Card, 1996; Elvira and Saporta, 2001), CB (Blau and Kahn 2003; Simon 2012) or social dialogue at the firm level (Heinze and Wolf, 2010; Oberfichtner et al, 2020).

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IR index: general considerations

- Many attempts at building IR indices but usually only for specific periods and/or countries and/or dimensions (Eurofound, 2018; Metten, 2021; Garnero, 2021).
- Main objective of the exercise is to construct an index:
 - encompassing many IR dimensions (e.g. CB, Social dialogue)
 - available at yearly frequency (from 1995 to 2019)
 - and for wide range of countries (EU27 + U.K.)
- which can then be used to analyse cross-country differences in IR regimes.
- Index is constructed using Multiple Correspondence Analysis (Greenacre, 2006; Le Roux and Rouannet 2010) on 22 variables.

IR index: variable selection

- Variables originates mostly from the OECD/AIAS database.
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- They are selected to cover five dimensions of IR (Visser, 2009):
 1. Trade Union strength \Rightarrow using density, labour market tightness, employment share in gvt sector ...
 2. Bargaining \Rightarrow Adjusted coverage, Level, Coordination, Extension ...
 3. Social Dialogue at firm level \Rightarrow Work Councils, their structure, rights, power ...
 4. Social Dialogue at national level \Rightarrow Bipartite and tripartite councils
 5. Other \Rightarrow Employer density, right to CB in gvt sector.
- Some adjustment for missing values and other issues.
- Index computed as the (rescaled) score obtained from the first extracted component.

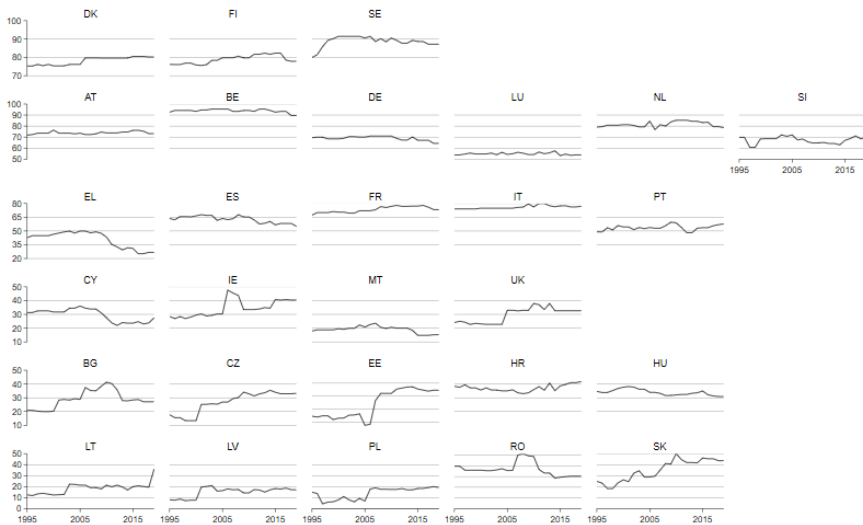
Results (1)

- High values of the index are associated to the following characteristics of IR:
 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. the involvement of workers/unions at the firm level through WC or union workplace representation together with substantial information and consultation rights.

Results (2): Average IR index

	Index	TU str.	Barg.	Involv.	Part.	Other
BE	93.3	18.5	30.9	27.1	5.8	11.1
SE	89.1	18.0	24.2	29.8	5.5	11.7
NL	81.5	13.3	28.9	24.0	4.2	11.0
DK	79.1	16.1	24.5	27.3	3.9	7.3
FI	78.9	16.3	29.3	24.7	0.0	8.6
IT	75.1	11.0	27.6	25.5	0.4	10.6
AT	73.5	7.4	29.2	25.0	4.2	7.7
FR	73.3	13.5	23.7	28.2	0.4	7.5
DE	67.9	10.7	25.4	25.1	1.3	5.5
SI	64.3	8.8	24.6	19.9	0.1	10.9
ES	62.6	8.8	26.8	20.0	0.0	6.9
LU	55.0	9.1	13.7	25.7	0.0	6.4
PT	53.3	7.3	23.2	16.5	0.4	5.9
EL	41.8	7.3	17.9	12.7	0.4	3.6
IE	36.8	6.4	13.3	8.8	0.3	8.0
HR	35.9	6.9	7.0	16.0	0.4	5.6
RO	35.5	5.9	19.0	7.2	0.2	3.3
SK	33.6	4.1	12.1	11.9	1.4	4.2
UK	32.6	7.9	11.7	5.8	1.6	5.7
HU	32.4	5.2	4.8	19.9	0.4	2.1
CY	32.1	10.2	14.0	0.0	0.0	7.9
BG	28.2	5.0	12.0	6.5	0.0	4.6
CZ	24.8	6.1	5.7	12.2	0.2	0.7
EE	23.6	3.9	7.3	8.6	1.2	2.6
MT	20.9	10.1	3.2	0.1	0.3	7.1
LT	19.9	8.2	3.4	6.4	0.5	1.4
LV	17.3	5.8	3.1	6.6	0.3	1.5
PL	13.7	4.8	2.2	4.9	0.3	1.6

Results(3)



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Data: The Structure of Earning Survey

- GPGs computed using the Structure of Earning Survey (SES) for the years 2006, 2010, 2014 and 2018.
- Sample of employees with information on gross hourly earnings including overtime, bonuses, ... (nominal and national terms).
- Advantages of using the SES:
 - harmonised framework for collection of detailed information on earnings and source for official EU statistics on GPGs,
 - possibility to work with hourly wages,
 - administrative data with large and representative sample size
- and limitations:
 - anonymisation procedure
 - small firms and/or operating in NACE O sector not always included.
 - no data for Austria and Ireland

Data: Sample restrictions

- Sample is restricted to individual aged 20 and over.
- Observation for apprentices, armed forces, skilled agricultural major occupation and public administration sector are dropped from the sample.
- Some countries (i.e., CY, LU, MT) have missing observations for key variables. Country/year issues as well in some cases (e.g. BE in 2006, DK in 2014, HR in 2010, LT and PT in 2018).

The GPG is defined as:

$$\Delta \bar{w}_{i,t} = \frac{\bar{w}_{i,t}^{men} - \bar{w}_{i,t}^{women}}{\bar{w}_{i,t}^{men}}$$

- where $\bar{w}_{i,t}$ is the average hourly wage for country i and year t .
- Following Ciminelli et al. (2021) \Rightarrow remove negative values (very marginal number), drop 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

Empirical strategy

- No information on TU membership. CB variable in the SES is not really useful.
- Use the IR index but only available at national level.
- As a results, we follow Blau and Kahn (2003) and Christofides et al. (2013):
 - Compute adjusted GPG using matching à la Nopo (2008) and OB decomposition for each country and year.
 - Regress Adjusted GPG on IR index and a set of control variables.
 - Adjusted GPG corresponds to the 'wage structure' effect \Rightarrow component capturing the effects of IR (Blau and Kahn, 2003).
- Preferred results from Nopo (2008) given that:
 - allow for the decomposition of arithmetic means (Kaiser, 2016)
 - Adjusted comp. can be interpreted as the treatment effect on the treated (Fortin et al., 2011)
 - No interest in the detailed decomposition
- OB used primarily for robustness purposes

Results: GPG decomposition

(1) = GPG; (2) = Adj. GPG

	OB Decomposition								Nopo 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

Adjusted GPG and Country level regressions

- Estimate pooled OLS, static RE and FE on adjusted GPG, controlling for GDP per capita, LFPR, social expenditure (ESPROSS) and yearly indicator variables.

$$\Delta \bar{w}_{i,t} = \mu + \gamma IR_{i,t} + \beta X_{i,t} + \eta_t + \alpha_i + \varepsilon_{i,t}$$

- check for non-linear effects (U-test of Lind and Mehlum, 2010)
- Perform some specification tests \Rightarrow FE is preferred.
- Apply the same steps but replacing the overall IR index by each IR dimensions.

Results: Fixed Effects and IR index/dimensions

	Unadj. - $\Delta \ln(w)$		Unadj. - Δw		Adj. OB		Adj. Ľopo	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
IR	0.02 (0.12)	-0.21 (0.17)	0.04 (0.1)	-0.15 (0.15)	-0.08* (0.04)	-0.37† (0.07)	-0.07† (0.03)	-0.35† (0.07)
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)
Δ UD	0.02 (0.08)	0.01 (0.07)	0.04 (0.07)	0.03 (0.07)	-0.05 (0.03)	-0.07† (0.03)	-0.06 (0.05)	-0.08† (0.04)
Δ lfp	0.41 (0.3)	0.32 (0.27)	0.33 (0.26)	0.26 (0.25)	-0.21 (0.2)	-0.32 (0.2)	-0.32† (0.14)	-0.42† (0.15)
$\ln(\text{gdp pcap})$	13.21 (9.91)	9.84 (9.56)	12.61 (8.82)	9.83 (8.67)	0.14 (5.05)	-4.09 (5.09)	-2.64 (4.16)	-6.7* (3.91)
SPB - gdp pc.	-0.01 (1.16)	0.96 (1.05)	-0.05 (1.06)	0.75 (1.07)	0.03 (1.4)	1.24 (1.12)	0.97 (1.47)	2.13* (1.25)
FCA - gdp pc.	-1.08 (1.95)	-2.27 (2.06)	0.07 (2.07)	-0.91 (2.22)	-0.46 (2.06)	-1.95 (1.63)	-0.39 (2.01)	-1.82 (1.62)
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^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

	Unadj. - $\Delta \ln(w)$		Unadj.- Δw		Adj. OB		Adj. Nopo	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
TU strength	0.21 (0.21)	0.62* (0.37)	0.22 (0.18)	0.56 (0.37)	0.11 (0.12)	-0.28 (0.18)	0.22 (0.14)	-0.4* (0.21)
TU strength ²	-	-0.03 (0.02)	-	-0.02 (0.02)	-	0.03* (0.01)	-	0.04† (0.01)
F-test	-	0.26	-	0.34	-	0.18	-	0.01
U-test	-	0.16	-	0.23	-	0.08	-	0.04
Shape	-	U	-	U	-	U	-	U
≤ 0	-	>17	-	>17	-	[0;10]	-	[0;9]
TP	-	11	-	12	-	5	-	5
Bargaining	0.15 (0.14)	-0.8† (0.31)	0.15 (0.13)	-0.7† (0.26)	-0.07 (0.07)	-0.52† (0.16)	-0.13† (0.03)	-0.32† (0.13)
Bargaining ²	-	0.03† (0.01)	-	0.03† (0.01)	-	0.01† (0.00)	-	0.01 (0.00)
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
≤ 0	-	[1;27]	-	[1;26]	-	[1;33]	-	[1;33]
TP	-	13	-	13	-	18	-	26
Involvement	-0.34† (0.07)	-0.39† (0.18)	-0.23† (0.05)	-0.27* (0.15)	-0.3† (0.1)	-0.58† (0.15)	-0.16† (0.08)	-0.4† (0.12)
Involvement ²	-	0.00 (0.01)	-	0.00 (0.00)	-	0.01 (0.01)	-	0.01† (0.00)
F-test	-	0.00	-	0.00	-	0.00	-	0.01
U-test	-	-	-	-	-	0.31	-	0.07
Shape	-	U	-	U	-	U	-	U
≤ 0	-	[0;31]	-	[0;31]	-	[0;31]	-	[0;31]
TP	-	100	-	82	-	24	-	20

† p<0.01, ‡ p<0.05, * p<0.1

4 Conclusion

Summary and main takeaways

- Using individual-level data from the SES, we propose an analysis of GPGs in hourly earnings and IR.
- An index of IR is constructed from the OECD/AIAS database and the GPG is decomposed using the OB and Nopo (2008) methodologies.
- The estimation of a simple static FE specification shows that higher values of the IR index are associated with lower adjusted GPG but:
 - the relationship could be non-linear
 - the effect could become positive for large values of the IR index.
- Estimation results by IR dimensions help shed some light on the U-shaped effect:
 - IR dimensions on bargaining and involvement have significant and negative effects on the GPG
 - TU strength is estimated to have a U-shaped or strictly increasing effect,
 - this could help understand the U-shaped effect reported for the overall IR index.