

# What drives the wage gap of vulnerable workers? Pay incentives, intangibles and gender wage inequality

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Expert workshop #1

Global trends and variations: technological transformations, globalisation, demographics – varieties by regime, region, sector: disruption or reiteration?

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Aims:

Investigating the drivers of gender wage inequality within firms in European countries in different technological contexts, by focusing on:

(a) The effects of incentive pay policies on the adjusted gender gap

(b) How intangible capital affects the direction and magnitude of such effects

Establishment level gender wage gap/workforce composition in six EU countries 2006-2018

### Outline:

- (i) Introduction
- (ii) Background and Research Questions
- (iii) Data and Methods
- (iv) Descriptive Evidence
- (v) Results
- (vi) Summary and Final Remarks

(ii) Background and Research Questions

### (ii) Background and Research Questions

- growing attention in recent years on the firm-level drivers of wage inequality
- In imperfect competition models, firms can adopt a variety of wage-setting practices shaping a firm-level wage premium that could reflect differences in productivity, rent-sharing, an efficiency wage premium, or strategic wage posting behavior
- when wage premia are asymmetric between groups of workers, they generate heterogeneity of wage gaps between firms (Aghion et al. 2018; Cirillo et al., 2017)
- both sorting and bargaining effects contribute significantly to shape firm-level heterogeneity in gender wage gaps (see Card et al, 2016; Blau and Kahn, 2000, 2017)
- intangibles tend to increase gender inequalities, by increasing returns in job positions where men tend to be over represented (e.g. Meyersson Milgrom et al., 2001; Korkeamäki and Kyyrä, 2006)
- labour market segregation is also the main explanation of the positive link between Incentive pay schemes (IPS) and gender inequality (e.g., Arabadjieva & Zwysen, 2022)
- However, the effects on gender pay gaps for work of equal value is left largely unexplored (see Manning and Saidi, 2010)

### (ii) Background and Research Questions

- OECD (2021) suggests that about one quarter of the gender wage gap reflects the concentration of women in low wage firms and the remaining part is due to differences in pay within firms
- Within-firm gender wage differences might be due either to:
  - differences in tasks and responsibilities
  - differences in pay for work of equal value (bargaining discrimination)

 Is such dimension of gender inequality affected by the adoption/strength of incentive pay schemes?

Impact on statistical discrimination/attraction of workers

 Is the presence of intangible capital affecting these impacts Impact on work organisation/models/flexibility

- Data Source: Structure of Earning Surveys (SES) business units with more than 10 employees
- Time coverage: 2006 2010 2014 2018
- Country Coverage: Germany, France, Italy, Poland, Spain, UK
- EU-KLEMS data for intangible capital stocks (25 industries)
- Samples: 8,872,144 employees; 184,652 establishments

Key variables:

- Hourly wage: Average gross hourly earnings in the reference month (B43)
- Individual variables: gender, age, education, tenure, professional occupation, type of contract
- Establishment level variables:
  - adjusted gender pay gap
  - propensity to pay high wages

- strength of Incentive Pay Schemes (IPS): firm-level average of the % of bonuses/allowances not paid in every period (B411) on gross annual earnings (B41)

- control variables: size, public/private ownership, collective bargaining, industry + variables based on the workforce composition (by education, tenure, occupation, type of contract)

- Intangibles (25 KLEMS industries, real net capital stock per worker, ppp 2018) Overall intangible capital stock and its components (Corrado et al., 2006):
  - Database and Software
  - Innovative Property (non-scientific and scientific R&D)
  - Economic Competencies (brand names, firm-specific human capital, and organizational structure)

Estimation of the adjusted gender wage gap within firms:

### (a) First step

Wage equation augmented with establishment level fixed effects (estimated separately for each year and country):

$$ln(w)_{ij} = \alpha + \beta Z_{ij} + \theta X_{ij} + \gamma_j + \widehat{w}_{ij}$$

Where:

- $(w)_{ij}$  is hourly wage of individual *i* employed in establishment *j*
- $Z_{ii}$  is a set of worker's personal characteristics (gender, age, education)
- X<sub>ij</sub> is a set of variables describing the worker's job position in establishment j (tenure, occupation, type of contract, part/full-time)
- $\gamma_i$  are establishment dummies that provides a measure of the tendency of each establishment to pay high/low wages

### (b) second-step

The residual w<sub>ij</sub>, is the 'adjusted individual wage', i.e., component of individual wages that differs between observationally identical individuals, with the same job, in the same firm; it can be used to create a measure of firm-specific adjusted wage inequality between workers' groups (Winter-Ebmer and Zweimuller, 1999; Cirillo et al., 2017):

$$\Delta w_j^G = E_j(\widehat{w}_{ij}^{male}) - E_j(\widehat{w}_{ij}^{female})$$

This is the metric used as the dependent variable in the estimation of the drivers of the within-firm (adjusted) gender pay gap

The investigation of the effects of incentive pay schemes (IPS) on the gender gap poses several identification challenges, due to endogeneity/reverse causality issues

To deal with the complexity of such interactions we rely of a (Maximum Likelihood) estimation of a trivariate recursive system of simultaneous equations:

$$\Delta w_{jrsct}^{G} = \beta_1 B S_{jrsct} + \beta_2 \hat{\gamma}_{jrsct} + \beta_3 Fem_S h_{jrsct} + \mathbf{V}'_{jrsct} \, \mathbf{\beta}_4 + \rho_r + \mu_s + \eta_c + \nu_t + I_{ct} + \varepsilon_{jrsct}^1$$

 $Fem_Sh_{jrsct} = \zeta_1 BS_{jrsct} + \zeta_2 \hat{\gamma}_{jrsct} + \zeta_3 Tert_Sh_{jrsct} + \zeta_4 Part_Sh_{jrsct} + \zeta_5 Temp_Sh_{jrsct} + V'_{jrsct} \zeta_6 + \rho_r + \mu_s + \eta_c + \nu_t + I_{ct} + \varepsilon_{jsct}^2 + \zeta_5 Temp_Sh_{jrsct} + V'_{jrsct} \zeta_6 + \rho_r + \mu_s + \eta_c + \nu_t + I_{ct} + \varepsilon_{jsct}^2 + \zeta_5 Temp_Sh_{jrsct} + \zeta_5 Temp_Sh_{jrsc$ 

 $BS_{jrsct} = \gamma_1 Inn_{jrsct} + \gamma_2 No\_coll\_barg_{jrsct} + \gamma_3 Manag\_Sh_{jrsct} + V'_{jrsct} \gamma_4 + \rho_r + \mu_s + \eta_c + \nu_t + I_{ct} + \varepsilon_{jsct}^3$ 

Where:

- $\Delta w_{jrsct}^{G}$  is the adjusted gender wage gap in firm *j*, region *r*, sector *s*, country c and year *t*;
- *Fem\_Sh<sub>jrsct</sub>* is the share of women in the (observed) workforce of the firm
- *BS<sub>jrsct</sub>* is the average bonus share in the firm (proxy of IPS)
- $\hat{\gamma}_{irsct}$  is the propensity to pay high/low wages
- *V* is a vector of control variables common to all equation
- $\rho_r$ ,  $\mu_s$ ,  $\eta_c$ ,  $\nu_t$ , are region, industry, country, year FE;  $I_{ct}$  is an interaction between country and year FE

The analysis of the effects of the intensity of intangible capital at industry level is based on a split sample analysis for subsamples of firms belonging to industries with capital intensity above/below the median and in the bottom/top quartile

(iv) Descriptive Evidence

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#### Raw gender pay gap by country

#### Raw gender pay gap by year



Share of female workers by country



#### Share of female workers by year



### (iv) Data and Descriptive Evidence





Share of female workers by industry





Correlation between raw/adjusted gender wage gap: 0.739\*\*\*

### (iv) Data and Descriptive Evidence

Gender wage gap and propensity to pay higher wages



Gender wage gap and average bonus share

Female share and propensity to pay higher wages

Gender wage gap and female share

### (iv) Data and Descriptive Evidence

Adjusted gender wage gap and Real net capital stock of intangibles per worker (ppp2018)



Adjusted gender wage gap and Real net capital stock in innovative property per worker (ppp2018) Adjusted gender wage gap and Real net capital stock in economic competencies per worker (ppp2018)

Adjusted gender wage gap and Real net capital stock

of database & software per worker (ppp2018)

al Stock)

(v) Results

### (v) Results: baseline model

A higher intensity of IP schemes:					
gap					
Possible interpretations:					
Incentive Pay (IP) schemes					
<ul> <li>Reduce the tendency of firms to resort to statistical discrimination, due to better screening and monitoring (of all workers)</li> </ul>					
• Attract those 'high potential' female workers who are less constrained by household workloads, who can reach the objectives/bonuses and gain a higher pay					
<ul> <li>Encourage female workers to impose a more gender balanced work/family conciliation model at home, to appropriate the bonus</li> </ul>					

	(1)	(3)	(3)
	Adjusted gender wage	Share of female	Average
_	gap	workers	bonus share
av_bonus_share	-0.564***	-1.136***	
	(0.148)	(0.203)	
firm_fe	0.061***	-0.035***	
	(0.005)	(0.006)	
s_female	-0.159***		
	(0.018)		
s_tert		0.007	
		(0.005)	
s_part		0.229***	
		(0.009)	
s_temp		0.014***	
		(0.005)	
inn_firm			0.009***
			(0.001)
nocollbarg			-0.012***
			(0.001)
s manager			0.035***
			(0.004)
d_fem_manager	0.007***	0.056***	0.004***
	(0.002)	(0.002)	(0.001)
av_tenure	0.001***	0.003***	0.002***
	(0.000)	(0.001)	(0.000)
public	-0.011***	0.020***	-0.007***
	(0.003)	(0.004)	(0.001)
2.fsize	0.004	0.010***	0.011***
	(0.002)	(0.003)	(0.001)
3.fsize	-0.001	0.015***	0.020***
	(0.004)	(0.005)	(0.001)
s_high_occup	0.023***	0.034***	0.025***
-	(0.006)	(0.008)	(0.001)
Constant	0.109***	0.344***	0.065***
	(0.022)	(0.019)	(0.005)
Observations	142,251	142,251	142,251
	•		

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

### (v) Results: Incentive Pay Schemes, gender inequality and intangibles

(Summary)

INTANG	Below p50 Over p	o50		IP schemes attenuate the gender gap only in contexts
av_bonus_share	-0.804*** -0.3 (0.169) (0.2	349 42)		less intangible capital intensive
	SOFT_DB av_bonus_share	, Below p50 -1.159*** (0.120)	Over p50 0.473 (0.429)	Specific components of intangible capital: IP schemes do not play a role in contexts of high endowment of:
	INNOVPROP			(a) Software and Databases
	av_bonus_share	-0.644*** (0.183)	-0.108 (0.173)	(c) Economic Competencies
	ECONCOMP			However:
	av_bonus_share	-1.021*** (0.140)	0.199 (0.406)	
	Ļ			Specific components of Feenomic Competencies:
	BRAND	Below p50	Over p50	specific components of Economic Competencies:
	av_bonus_share	-0.935**** (0.154)	-0.010 (0.324)	<ul> <li>IP schemes do not play where a role in contexts of high brand/advertisement expenditures</li> </ul>
	ORGAN. CAPITAL			
	av_bonus_share	-1.043*** (0.112)	-0.122*** (0.047)	<ul> <li>IP schemes reduce the adjusted wage gap even in context of high expenditures in knowledge embedded in firm-specific human and structural</li> </ul>
	TRAINING			resources;
	av_bonus_share	-0.680*** (0.159)	-0.644** (0.286)	(a) Organizational capital (b) Training

(Summary)

*Possible interpretations:* 

*(i) In contexts of high intensity of software & databases, innovative property and brands the <u>IP schemes do</u> <u>not attenuate</u> the gender gap:* 

In contexts (high SOFT\_DB, INNOVPROP, BRANDS) where intangible capital pushes towards a flexibilization of work models (longer and more unpredictable working hours/work schedules) IP schemes do not attenuate the gender gap as, in the presence of unequal sharing of household responsibilities as:

(a) female workers are less likely to reach the targets and get the bonus

(b) female workers tend to lose strength during wage bargaining (on the variable component of pay, based on performance)

(c) firms are more likely to go back to statistical discrimination assuming that their performance will be lower

(ii) In contexts of high endowment of organizational capital and training <u>IP schemes attenuate</u> the gender gap:

- (a) In contexts with more developed organizational/business models (high ORGCAP) the more advanced monitoring systems and incentive schemes enable a more effective implementation of IP schemes, reducing the needs for statistical discrimination
- (b) In contexts where the development of workforce skills plays a crucial role (high TRAIN), the recruitment of human resources is more effective (screening, probation mechanisms, etc.) in order to maximize the returns to investments in training, and this increases the probability that female workers have a working potential as high as the male counterparts and can reach the incentives

(v) Summary and Final Remarks

# (vi) Summary and Final Remarks

- Major limitations of our analysis:
  - (a) no longitudinal data on workers/firms
  - (b) limited information on firms' characteristics
- Firm-level characteristics play a relevant role in shaping the gender composition of the workforce and the differences in pay for work of equal value within the firm
- We focus on the role of one HR management dimension that we can observe and proxy with SES data: the intensity of Incentive Pay Schemes (IPS), measured as the average share of bonuses on total earnings for the firm's employees
- Consistent with Manning and Saidi (2010), we find that firms implementing more intensive IPS exhibit a lower adjusted gender pay gap and this might be explained in terms of:
  - (a) lower statistical discrimination
  - (b) stronger effort to reconcile work/family loads
  - (c) attraction of those 'high potential' female workers who are less constrained by household workloads
- However, the presence of intangibles implying more flexible work arrangements prevents IP schemes to play this role, as if in such contexts reconciling work and family becomes more challenging and the factors shaping the gender pay gap (for work of equal value) regain strength
  - ICT/digitalisation-driven work flexibility is really helping to address labour market gender asymmetries?