

# Gender wage differences and GVC involvement based on Structure of Earnings Survey

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# Motivation

- to expand the existing literature on Europe-focused research assessing the association between global production links and the gender inequalities
- to investigate the effect of globalisation on gender wage gap using employee-employer data
- benefits coming from integration into GVCs may be limited due to the gender issues
- to examine the neoclassical theory assuming that international competition pressure rising along with the trade liberalization should lead to the narrowing of gender discrimination (Becker, 1957)

# Previous studies of the possible association between GVC and gender wage gap (1)

- the links between trade integration and the gender wage gap remain ambiguous (Pieters, 2015)
- positive relationship between the GWG and general international trade involvement: Menon Van der Meulen Rodgers (2009) evidence for India's manufacturing sectors for the years 1983-2004; Berik (2000) for Taiwan; Berik et al. (2004) for Taiwan and Korea; Dominguez-Villalobos and Brown-Grossman (2010) for Mexico; Coniglio and Hoxhaj (2018) for Vietnam
- negative relationship between the GWG and general international trade involvement: Black Brainerd (2004) for US; Hazarika and Otero (2012) for Mexico; Juhn et al. (2014) for Mexico; Chen, Ge, Lai Wan (2013) for China; Robertson et al. (2019) for Sri Lanka and Cambodia
- for developed countries the impact of international trade on the GWG differs according to workers' characteristics like the skill level, task composition and occupation type (Ben Yahmed, 2012; Juhn et al., 2014), and also to the industry position in a GVC (Chen, 2017) and the export structure (Busse Spielmann, 2006)

# Previous studies of the possible association between GVC and gender wage gap (2)

- little evidence on European workers:
  - for Norway: Boler, Javorcik Ulltveit-Moe (2018): firms involvement in export activities increases the GWG for college educated workers; Boler et al. (2015): women perceived as less committed workers may be more wage-discriminated against in export-connected companies
  - for Belgium: Gagliardi, Mahy Rycx (2018): inequalities in the social upgrading of workers resulting in unfair remuneration of women in comparison to men at any level of earnings
  - for Germany: Heinze Wolf (2010) increased trade involvement which boosts competition in the labour market reduces the wages of less-skilled workers, who are mainly women, and therefore it does not reduce the GWG
- linkages between sector concentration and the GWG
  - positive impact of increased market competition on narrowing the GWG: Black and Strahan (2001) for evidence from the US and Meng (2004) for Australia
  - opposite results: Heyman, Svaleryd Vlachos (2013) for evidence from Sweden and Li and Dong (2011) for China
- a heterogeneous impact of international trade on GWG depending on the skill level: ILO data for the period 1983-99 covering 80 countries around the world (von Oostendorp, 2009)

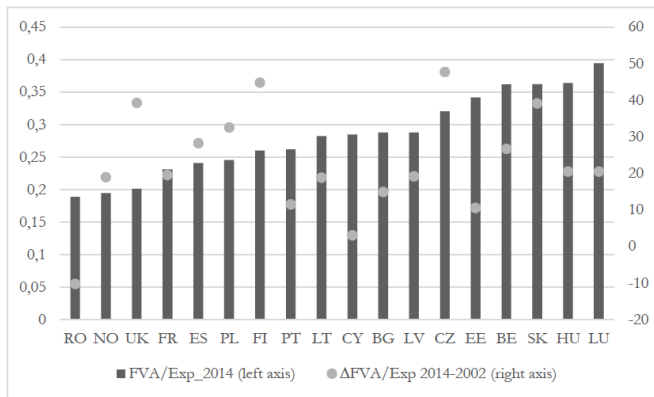
# Data - Structure of Earnings Survey (SES)

- employee data with employer's characteristics
- data for the years 2002, 2006, 2010 and 2014 (only manufacturing sectors)
- given the availability of the data: 6,431,017 observations for 18 European countries (BE, BG, CY, CZ, EE, ES, FI, FR, HU, LT, LU, LV, NO, PL, PT, RO, SK, UK)
- outcome variable: average gross hourly wage in the reference month
- characteristics of worker: sex, length of service, age group, education, type of employment contract, full/part time employment, skill level
- characteristics of enterprise: size; public/private, collective pay agreement scheme
- country level data: wage setting coordination scheme, openness

# Data - World Input-Output Database (WIOD)

- industry level data from WIOD
- latest release from 2016
- 43 countries, 56 sectors
- input-output tables (WIOT) - calculation of measure of foreign value added embodied in exports (FVA/Exp) of a given industry proposed by Feenstra (2017) as a measure of involvement into production fragmentation processes
  - higher the FVA/Exp means that the export of given country is more depended on inputs that were previously imported

# Foreign value added embodied in export (FVA/Exp) in 2014 and the relative change between the years 2002 and 2014 (in percentage) by countries



Notes: weights applied (based on grossing-up factor for employees (from SES)).

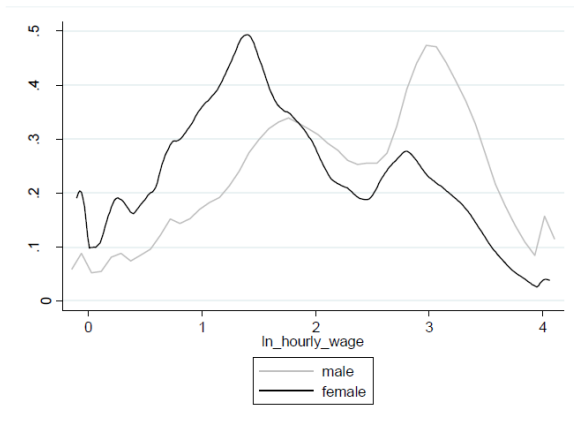
Source: own elaboration based on SES.

# Male/female mean wage differences

	2002	2006	2010	2014
BE	1.19	1.16	1.12	1.08
BG	1.27	1.27	1.33	1.33
CY	1.72	1.59	1.58	1.39
CZ	1.40	1.36	1.36	1.34
EE	1.34	1.45	1.47	1.41
ES	1.32	1.31	1.27	1.23
FI	1.21	1.19	1.17	1.14
FR	1.27	1.21	1.14	1.14
HU	1.26	1.30	1.29	1.23
LT	1.26	1.35	1.45	1.36
LU	1.17	1.21	1.19	1.24
LV	1.13	1.25	1.27	1.26
NO	1.15	1.13	1.13	1.10
PL	1.25	1.29	1.26	1.26
PT	1.50	1.45	1.40	1.38
RO	1.33	1.26	1.21	1.21
SK	1.53	1.51	1.41	1.40
UK	1.30	1.25	1.27	1.21



# Distribution of logarithm of hourly wages by gender



Notes: weights applied, based on grossing-up factor for employees (from SES).

Source: own elaboration based on pooled SES data.

# Model specification

$$\ln w_{ijct} = \alpha + \beta_1 \text{Sex}_i + \beta_2 \text{GVC}_{jct-1} + \beta_3 \text{Sex}_i * \text{GVC}_{jct-1} + \beta_4 \text{Ind}_{it} + \beta_5 \text{Firm}_{it} + \beta_6 \text{Sector}_{jct} + \beta_7 \text{Country}_{ct} + D_t + D_j + D_c + \varepsilon_{ijct} \quad (1)$$

where: i: denotes workers, j: refers to the sector of employment, c: is country, t: time

# Results - selected variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Sex <sub><i>i</i></sub>	0.129***	0.154***	0.138***	0.135***	0.132***	0.139***	0.126***	0.127***
	[0.025]	[0.017]	[0.016]	[0.014]	[0.011]	[0.012]	[0.010]	[0.010]
FVA/Exp <sub><i>i,t</i></sub>	-0.422*	-0.370*	-0.364**	-0.360**	-0.523***	-0.509***	-0.396**	-0.410**
	[0.213]	[0.185]	[0.173]	[0.172]	[0.144]	[0.147]	[0.161]	[0.161]
Sex <sub><i>i</i></sub> ×FVA/Exp <sub><i>i,t</i></sub>	0.252***	0.180***	0.211***	0.156***	0.153**	0.127**	0.183***	0.181***
	[0.081]	[0.057]	[0.052]	[0.046]	[0.053]	[0.054]	[0.051]	[0.051]

- average hourly wages are lower for women than for men
- negative impact of FVA/Exp on wages
- the negative effect of GVCs on wages is lower for men than for women

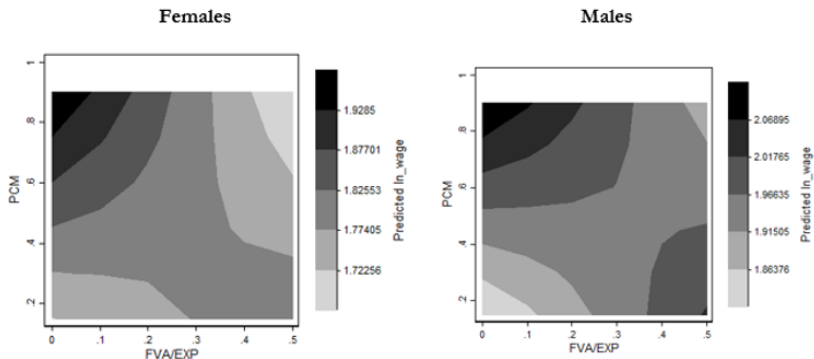
## Results - individuals' and company level determinants

- younger people, with low and medium levels of education, in temporary employment, with a shorter tenure in their jobs and in less skilled occupations predominantly earn less
- those employed in small and medium-sized enterprises and those involved in an industry-level collective pay agreement scheme are also exposed to lower wages
- negative association between GVCs and wages is stronger for workers with medium-level education, especially women; the same pattern for medium skilled workers
- GVCs are associated with lower wages for craft and related traded workers and for plant and machine operators and assemblers, while for the latter the effect is less severe for male workers
- for managers and technicians and associated professionals the production fragmentation measured using FVA embodied in exports is associated with higher wages for male workers

# Extensions

- a need for controlling for concentration of the sector (Berik et al., 2004; Menon Van der Meulen Rodgers, 2009)
- interaction between sex, GVC and sector concentration, the latter measured by price-cost margin (PCM) proposed by Aghion et al. (2008)
- PCM as the proportion of the difference between value added (VA) and labour compensation (LAB COMP) to the gross output (GO) of a given sector
- the values of PCM ranges from (0,1), where the higher the score, the lower the competitiveness and greater the sectors concentration

# Contour plots with log hourly wage



- in concentrated sectors involvement in global value chains is associated with lower female wages
- this negative effect is not seen in competitive sectors

# Conclusions

- we report a gender wage discrimination among European employees regardless the model specification
- lower wages are typical for younger people, those with low and medium level of education, having temporary type of employment, with shorter tenure in enterprise and performing lower skilled occupation
- employees from small and medium size enterprises as well as in those with industry level collective pay agreement scheme are exposed to pay lower wages
- **the impact of FVA/Exp on wages is negative and statistically significant for our baseline estimations; this negative effect of GVCs on wages is lower for male workers**
- **greater involvement in GVCs only results in higher GWG in less competitive sectors**

Thank you for your attention.

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