Bargaining for Trade: When Exporting Becomes Detrimental to Female Wages

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Introduction

- Limited evidence and diverging results on the link between exports and the **gender wage gap**
  - Bøler et al. 2018: Wage penalty for college-educated female workers in Norwegian exporting firms
  - Bonfiglioli and De Pace 2021: Wage premium for white-collar female workers in exporting firms in Germany

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- **Exporters**: more productive, profitable, and can afford more advanced technology (Melitz 2003; Bustos 2011), but also heterogeneous
- Trade differentiated goods $\rightarrow$ more interaction is needed between a buyer and a seller to agree upon a contract $\rightarrow$ **contract-intensive**

Could Firm Contract Intensity Matter?

High

Manufacturing of computers, Graphical services before print, Breweries

Low

Malt production, Meat production, Manufacturing of electrical cables

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- Men and women in a firm may be differently affected:

  Differences in the gender wage gap in exporting firms, depending on the degree of contract intensity

Why would the degree of contract intensity affect men and women differently?

1. Female comparative advantage in interpersonal skills/relations, white collar occupations/tasks (Black and Spitz-Oener 2010; Borghans et al. 2014; Ngai and Petrongolo 2017; Cortes et al. 2018; Bonfiglioli and De Pace 2021)

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2. Male comparative advantage in negotiations (Walters et al. 1998; Stuhlmacher and Walters 1999; Gneezy et al., 2003; Bowles et al., 2005; Niederle and Vesterlund, 2007, 2011; Hederos Eriksson and Sandberg, 2012)

Our Paper

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- **Method**: Tight identification strategy with match and firm–year fixed effects to take care of assortative matching and unobserved firm heterogeneity
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  - Separate the effect of foreign ownership from the effect of exporting

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  - Use the Nunn (2007) contract intensity index to proxy for the need of interaction
  - Separate the effect of foreign ownership from the effect of exporting

- **Results**: Export of goods that are intensive in interpersonal contacts widens the gender wage gap, presumably due to the male comparative advantage in bargaining

Relation to the Literature

- Export and the gender wage gap (Juhn et al. 2014; Saure and Zoabi 2014; Bøler et al. 2018; Bonfiglioli and De Pace 2021)

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- Export wage premium (Bernard et al. 1995; Bernard and Jensen 1999; Schank et al. 2007, Munch and Skaksen 2008, Irarrazabal et al. 2013, Krishna et al. 2014, Macis and Schivardi 2016, Barth et al. 2016, Helpman et al. 2017; Bødker et al. 2018, Frías et al 2022)

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- Effect of FDI on gender-specific labor market outcomes (Kodama et al. 2018; Khoban 2021; Tang and Zang 2021; Halvarsson et al. 2022)

Contribution: Focus on exported goods, isolate the effect of exports in domestically owned firms (avoid FDI effects)

Empirical Strategy

Empirical wage equation

$$\begin{aligned} ln(Wage)_{ijkt} =& \beta_1[Female_i \times (Export/Sales)_{jt} \times CI_k] \\ &+ \beta_2[Female_i \times (Export/Sales)_{jt}] \\ &+ \mathbf{X}_{it}\gamma + \mathbf{F}_{jt}\phi + \mu_{ij} + \eta_{jt} + \varepsilon_{ijkt} \end{aligned}$$

$i = individual; j = firm; k = industry; t = time$

Baseline specification: Match FE's (μ_{ij}) and Firm×Year FE's (η_{jt}) plus individual level control variables Variables

Extended specifications: Firm×Year×Occupation FE's and Match×Occupation FE's

Data

- Matched employer–employee data, 1997–2015 (Statistics Sweden)
- Export data: goods customs data (Statistics Sweden)
- Nunn (2007) industry-level (NACE, 4-digit) contract intensity index:

  The fraction of differentiated goods neither sold on an organized exchange nor reference-priced

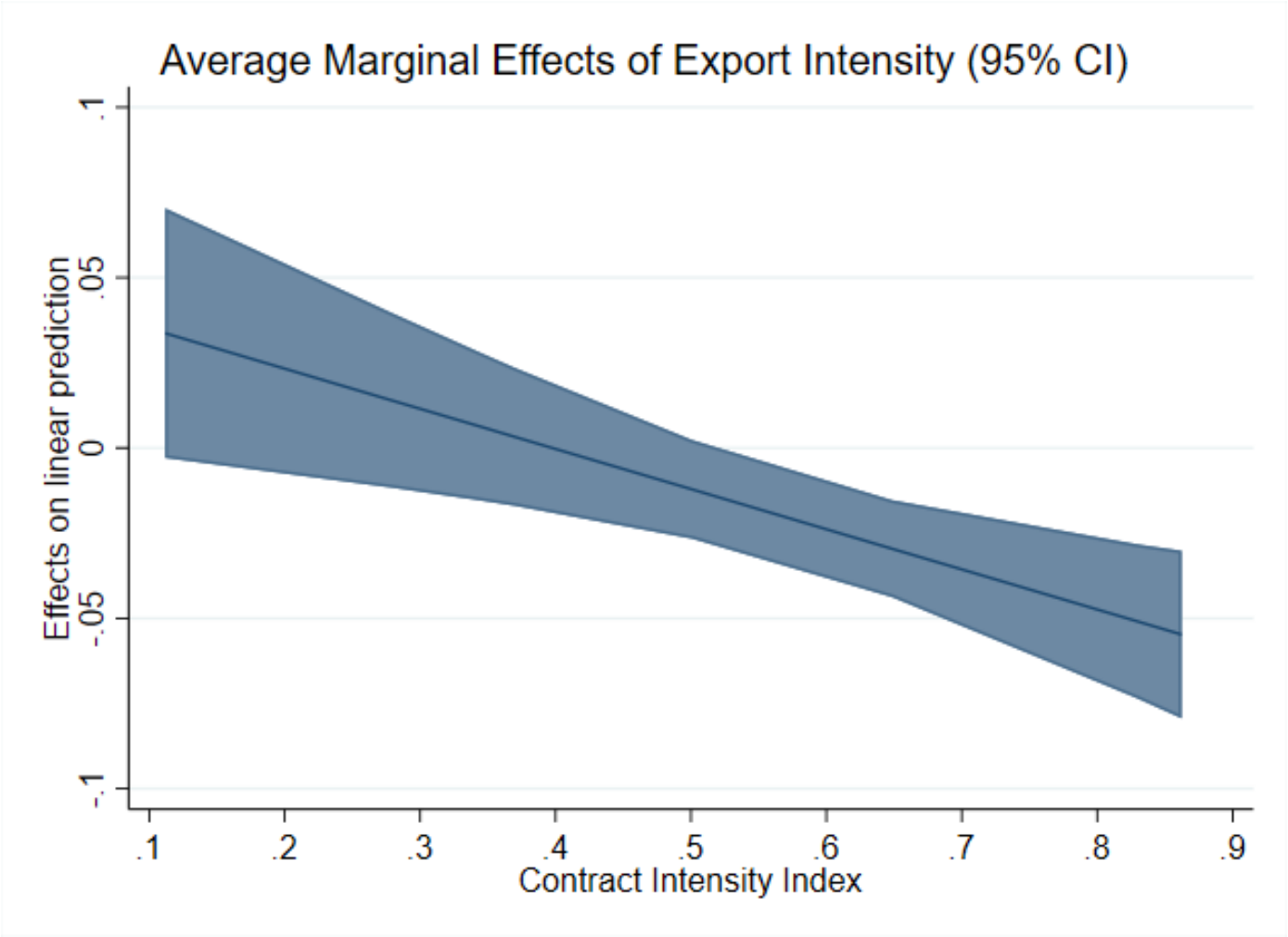
Descriptive table: Firm level | Descriptive table: Individual level

Results: Contract Intensity and the Gender Wage Gap

Table: Contract Intensity, Export, and the Gender Wage Gap

Dep. var: ln(Wage)	(1)	(2)	(3)	(4)
Female×(Export/Sales)×CI		-0.118***	-0.109***	-0.093***
		(0.037)	(0.026)	(0.019)
Female×(Export/Sales)	-0.029**	-0.016**	-0.011***	-0.009**
	(0.014)	(0.007)	(0.004)	(0.004)
Match FE	yes	yes	yes	no
Firm×Year FE	yes	yes	no	no
Firm×Year×Occup. FE	no	no	yes	yes
Match×Occup. FE	no	no	no	yes
Observations	4,886,752	4,886,752	4,306,607	4,048,976
Adj R2	0.930	0.930	0.937	0.943

Marginal Effects Plot: Goods Export Intensity



Density plot

Heterogeneity Analysis

- Are some groups of workers affected more than others?

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- **Occupation**: White-collar workers vs. blue-collar workers

Heterogeneity: Education and Occupations

Table: Heterogeneity: Education and Occupation

	Education		Occupation	
Dep. var: ln(Wage)	College	No college	White-collar	Blue-collar
	(1)	(2)	(3)	(4)
Female×(Export/Sales)×CI	-0.102***	-0.100***	-0.146***	0.006
	(0.030)	(0.028)	(0.035)	(0.025)
Female×(Export/Sales)	-0.020***	-0.012**	-0.016**	-0.002
	(0.007)	(0.006)	(0.007)	(0.006)
Match FE	yes	yes	yes	yes
Firm×Year FE	yes	yes	yes	yes
Observations	805,962	4,060,382	2,446,447	2,401,198
Adj R^2	0.949	0.904	0.946	0.807

Heterogeneity Occupations

Robustness

- Main findings robust to exclusion of small firms, workers with short tenure, non-manufacturing firms, and **inclusion of foreign-owned firms** Robustness

! The effects are most pronounced for domestic exporting firms (outside of MNEs) that trade with **external foreign partners**

- Robust to the alternative measures of contract intensity (Variable export / Fixed export / SPIN) CI measures

- The results do not appear to be driven by women lacking temporal flexibility (Bøler et al. 2018; Goldin 2014) Flexibility

Rent Sharing and Bargaining Ratios

	Basic model			Extended model		
	Rent-sharing coefs			Rent-sharing coefs		
	Male	Female	Ratio M/F	Male	Female	Ratio M/F
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. High CI firms, excess log value added per worker, 1997–2015, three-year stayers						
Three-year change, winsorized at +/ − 0.75	0.033	0.029**	0.895**	0.033*	0.028***	0.863***
	(0.022)	(0.012)	(0.367)	(0.017)	(0.010)	(0.199)
Three-year change, trimmed at +/ − 0.75	0.034	0.030**	0.897**	0.033*	0.029**	0.867***
	(0.025)	(0.013)	(0.396)	(0.019)	(0.011)	(0.224)
To restrictions	0.030	0.027**	0.896**	0.031**	0.027***	0.864***
	(0.020)	(0.011)	(0.351)	(0.016)	(0.009)	(0.188)
Panel B. Low CI firms, excess log value added per worker, 1997–2015, three-year stayers						
Three-year change, winsorized at +/ − 0.75	-0.004	0.010	-1.171	-0.007	0.000	-0.006
	(0.010)	(0.004)	(5.643)	(0.009)	(0.010)	(1.464)
Three-year change, trimmed at +/ − 0.75	0.004	0.009	2.231	0.002	0.007	4.257
	(0.010)	(0.010)	(3.877)	(0.009)	(0.010)	(17.005)
To restrictions	-0.003	0.003	-0.989	-0.006	-0.002	0.339
	(0.010)	(0.010)	(6.205)	(0.007)	(0.009)	(1.267)

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Conclusions

- Export of goods that are intensive in interpersonal contacts widens the gender wage gap
- The result appears to be driven by white-collar workers
- The result is most pronounced for domestic exporting firms, trading with external foreign partners
- Robust result across various specifications
- The male comparative advantage in bargaining is a plausible explanation for a larger gender wage gap in contract-intensive firms, which require more buyer–seller interaction

Thank you

Curious to hear your thoughts

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Descriptive table: Firm level

Table: Firm Descriptive Statistics: High VS Low CI Index Firms

	Mean	Median	SD	Min	Max
Panel A. High CI Index Firms					
Firm size (number of employees)	230	45	921	2	17,340
Sales (mln €)	8,453.29	979.12	43,841.79	0.53	986,640.50
Export/Sales	0.23	0.07	0.29	0.00	1.00
CI Index	0.64	0.64	0.13	0.46	0.93
Female share of labor force	0.26	0.21	0.19	0.00	1.00
Panel B. Low CI Index Firms					
Firm size (number of employees)	160	41	468	2	7,217
Sales (mln €)	6,809.29	959.48	25,520.13	0.44	603,443.25
Export/Sales	0.18	0.06	0.25	0.00	1.00
CI Index	0.37	0.40	0.08	0.02	0.46
Female share of labor force	0.26	0.20	0.19	0.01	1.00

Notes: All numbers are based on the panel of firm-level data of domestic exporting firms for 1997–2015. Firms are classified as high (low) contract-intensive if their CI index is above (below) the median CI index in the sample.

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Descriptive table: Individual level

Table: Individual Descriptive Statistics: High VS Low CI Index Firms

	High CI			Low CI		
	All	Female	Male	All	Female	Male
Monthly Wage (€)	3,476.29	3,237.51	3,541.95	3,041.08	2,837.12	3,112.33
Monthly Wage (log)	8.09	8.02	8.11	7.97	7.91	7.99
Experience	20.49	19.09	20.87	21.79	20.53	22.22
Age	42.11	41.42	42.30	42.10	41.71	42.23
Share with children	0.44	0.43	0.44	0.41	0.41	0.41
Education						
Share with college education	0.22	0.26	0.20	0.10	0.15	0.08
Occupation						
Share of white-collar workers	0.59	0.74	0.55	0.39	0.53	0.34
Share of blue-collar workers	0.41	0.26	0.45	0.61	0.47	0.66
Number of individuals	490,255	119,406	370,849	365,413	105,604	259,809
Number of individual–year obs	2,886,829	622,617	2,264,212	1,999,923	517,799	1,482,124

Notes: All numbers refer to average values of the indicated variables for the panel of worker-level data for 1997–2015. Workers belong to high (low) contract-intensive industry if the CI index of their employer is above (below) the median CI index in the sample.

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Variables

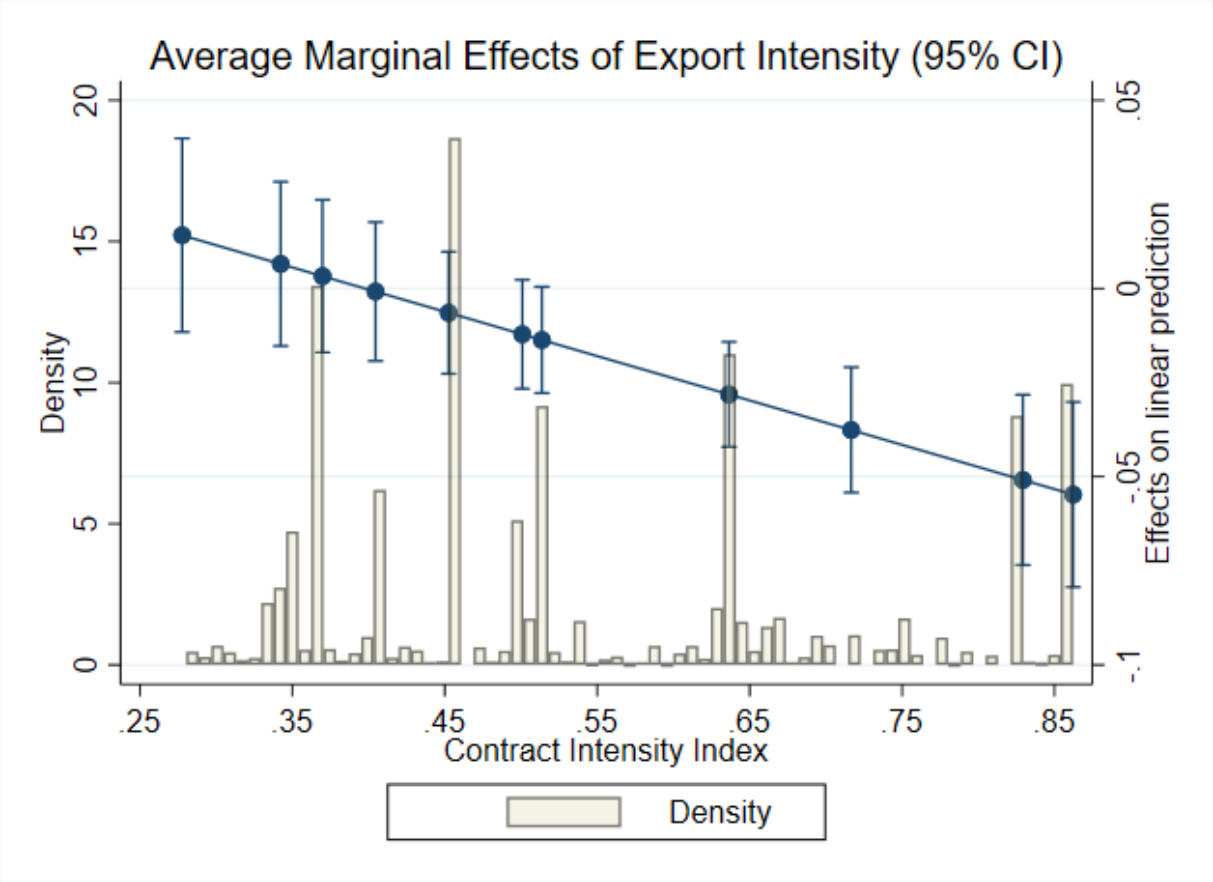
Main variables:

- Female (Dummy)
- Export intensity (Export/Sales)
- Contract Intensity (Nunn (2007) or Export CI)

Worker-level controls:

- Potential labor marker experience
- Experience^2/100
- University education (Dummy)
- Children (Dummy)

Marginal Effects Plot: Goods Export Intensity with Firm Density



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Heterogeneity: White-collar occupations

Table: Heterogeneity by White-Collar Occupations

	White-collar occupations			
Dep. var: ln(Wage)	Managers (1)	Sales (2)	Tech (3)	Support (4)
Female×(Export/Sales)×CI	-0.144**	-0.131	-0.092***	-0.010
	(0.071)	(0.084)	(0.017)	(0.028)
Female×(Export/Sales)	-0.028	-0.024	-0.012***	-0.025***
	(0.017)	(0.018)	(0.004)	(0.008)
Match FE	yes	yes	yes	yes
Firm×Year FE	yes	yes	yes	yes
Observations	280,367	320,259	800,611	661,043
Adj. R^2	0.959	0.901	0.946	0.955

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Robustness I

Table: Robustness I

Dep. var: ln(Wage)	$>$ 50 employees (1)	3+ yrs tenure (2)	Manufacturing (3)	Incl. fgn-owned (4)	Only fgn-owned (5)
Female×Export/Sales×CI	-0.119***	-0.123***	-0.110***	-0.082**	-0.001
	(0.039)	(0.040)	(0.042)	(0.036)	(0.025)
Female×Export/Sales	-0.016**	-0.015*	-0.021**	-0.013**	-0.002
	(0.008)	(0.008)	(0.008)	(0.005)	(0.005)
Match FE	yes	yes	yes	yes	yes
Firm×Year FE	yes	yes	yes	yes	yes
Observations	4,627,318	2,968,108	2,575,261	9,094,119	4,055,687
Adj R^2	0.929	0.939	0.939	0.932	0.938

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Robustness II

Table: Robustness II

	(1) CI SPIN	(2) Export CI Time-varying	(3) Export CI Fixed	(4) PPML	(5) Dom. sales
Female×(Export/Sales)×CI	-0.086**	-0.045***	-0.061***	-0.139***	-0.125***
	(0.035)	(0.017)	(0.022)	(0.043)	(0.043)
Female×(Export/Sales)	-0.019**	-0.026**	-0.028**	-0.019**	-0.017**
	(0.008)	(0.012)	(0.012)	(0.008)	(0.008)
Female×Dom.Sales×CI					-0.007
					(0.012)
Female×Dom.Sales					-0.001
					(0.002)
Match FE	yes	yes	yes	yes	yes
Firm×Year FE	yes	yes	yes	yes	yes
Observations	4,065,202	4,814,550	3,608,677	4,886,752	4,886,752
Adj. R^2 / Psuedo R^2	0.936	0.930	0.937	0.934	0.930

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Robustness III

Table: Robustness: Temporal flexibility

Dep. var: ln(Wage)	Baseline (1)	No child 0-6 (2)	Age>44 (3)	High CI (4)	Low CI (5)
Female×(Export/Sales)×CI	-0.118***	-0.126***	-0.132***		
	(0.037)	(0.038)	(0.045)		
Female×(Export/Sales)	-0.016**	-0.014**	-0.015**		
	(0.007)	(0.007)	(0.007)		
Female×ln(BusHours)				-0.005	-0.002
				(0.003)	(0.004)
Match FE	yes	yes	yes	yes	yes
Firm×Year	yes	yes	yes	yes	yes
Observations	4,886,752	3,877,889	2,058,797	2,096,393	2,719,692
Adj. R^2	0.930	0.936	0.960	0.946	0.911

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