Bargaining for trade: When exporting becomes detrimental for female wages

Daniel Halvarsson, Olga Lark, Patrik Tingvall & Josefin Videnord

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Email: josefin.videnord@nek.uu.se

Introduction I

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- **Exporters**: more productive, profitable, and can afford more advanced technology (Melitz 2003; Bustos 2011)

- Trade differentiated goods $\rightarrow$ more interaction is needed between a buyer and a seller to agree upon a contract $\rightarrow$ **contract-intensive**

Introduction II

High contract intensity
Manufacturing of computers, Graphical services before print, Breweries

Low contract intensity
Malt production, Meat production, Manufacturing of electrical cables

- Higher CI $\rightarrow$ more interaction with buyers abroad
  - Number of tasks associated with exporting $\uparrow$
  - Share of people involved in trade activities $\uparrow$

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- Higher CI $\rightarrow$ more interaction with buyers abroad
  - Number of tasks associated with exporting $\uparrow$
  - Share of people involved in trade activities $\uparrow$
- 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

Introduction III

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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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)

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)

- **How does the degree of contract intensity of exporting firms relate to the gender wage gap?**

Our paper

- We investigate how contract intensity of exporting firms is related to the gender wage gap

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- High-quality, detailed Swedish employer–employee data, 1997–2015

Data

- Matched Swedish employer–employee data, 1997–2015 (Statistics Sweden)

- Export data: goods customs data (Statistics Sweden)

- Nunn (2007) industry-level (NACE, 4digit) contract intensity index: index of the fraction of differentiated goods sold neither on an organized exchange nor reference-priced

Descriptive table: Firm level Descriptive table: Individual level

Empirical strategy

Empirical wage equation

$$ln(Wage)_{ijkt} = \beta_1[Female_i \times (Export/Sales)_{jt} \times CI_k]$$
$$+ \beta_2[Female_i \times (Export/Sales)_{jt}] \qquad (1)$$
$$+ \mathbf{X}_{it}\gamma + \mathbf{F}_{jt}\phi + \eta_{ij} + \eta_{jt} + \varepsilon_{ijkt}$$

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

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

- **Extended fixed effects specifications**: Firm×Year×Occupation FE's and Match×Occupation FE's

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

Notes: The dependent variable is deflated log monthly wage. Additional control variables included in all specifications are: Female×ln(Sales), Experience, Experience^2/100, Children, College, White Collar, and Region. Robust standard errors clustered at firm-level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

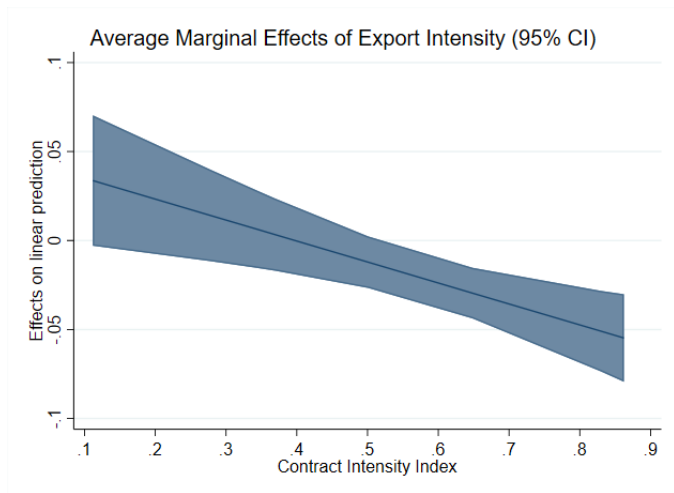# Marginal effects plot: Goods export intensity

Figure: Marginal effects of export intensity

Density plot

Robustness

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

Notes: Estimates are based on the worker-level panel data over 1997–2015. Workers of the following exporting firms are considered: (i) domestic in columns (1)–(3), (ii) all in column (4), (iii) only foreign-owned in column (5). Additional control variables included in all specifications are: Experience, Experience^2/100, Children, College, White collar, and Female×ln(Sales). Standard errors clustered at the firm level are in parentheses. Significance levels: *** ($p < 0.01$), ** ($p < 0.05$), and * ($p < 0.1$).

Further robustness

- Robust to the alternative measures of contract intensity (Export, fixed, SPIN) Robustness II

- The results do not appear to be driven by the female lack of temporal flexibility (Bøler et al. 2018; Goldin 2014) Robustness III

Heterogeneity analysis

- Are some groups of workers affected more than others?

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- **Education**: College-educated workers vs. not college-educated workers

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

Heterogeneity: Education and occupations

Table: Heterogeneity: Education and Occupation

Dep. var: ln(Wage)	Education		Occupation	
	College (1)	No college (2)	White-collar (3)	Blue-collar (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

Notes: Estimates are based on the worker-level panel data over 1997–2015, whereas workers employed in domestic exporting firms are considered. Additional control variables included in all specifications are: Experience, Experience^2/100, Children, College (columns (3) and (4)), White collar (columns (1) and (2)), and Female×ln(Sales). Standard errors clustered at the firm level are in parentheses. Significance levels: *** ($p < 0.01$), ** ($p < 0.05$), and * ($p < 0.1$).

Heterogeneity Occupations

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- Most pronounced for domestic exporting firms who trade with external foreign partners

- The male comparative advantage in bargaining may explain the increasing gender wage gap in contract-intensive exporting firms, which require more buyer–seller interactions

Thank you!

josefin.videnord@nek.uu.se

Relation to the literature I

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

Back

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- Firm-, industry- and occupational-level characteristics behind the differences in pay between men and women (Goldin 2014; Card et al. 2016; Blau and Kahn 2017; Masso et al. 2021).

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- The contract-intensity index (Rauch 1999; Nunn 2007; ...)

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- The contract-intensity index (Rauch 1999; Nunn 2007; ...)

- Foreign-ownership and gender related labor-market outcomes (Kodama et al. 2018; Tang and Zhang 2021; Halvarsson et al. 2022)

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Relation to the literature II

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- Risk-preferences and competitiveness (Croson and Gneezy 2009; Bertrand 2011; Niederle and Vesterlund 2007)

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Descriptive table: Firm level

Table: Firm descriptive statistics: High versus low CI index firms

	Means			Medians		
	High CI	Low CI	*p*	High CI	Low CI	*p*
Firm size (number of employees)	294	237	0.00	64	59	0.00
Sales (mln €)	8,498	6,809	0.00	975	959	0.02
Export/Sales	0.23	0.18	0.00	0.06	0.06	0.00
CI index	0.64	0.37	0.00	0.64	0.40	0.00
Female share of labor force	0.28	0.28	0.01	0.23	0.24	0.00
Number of firms	2,619	2,547		2,619	2,547	

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. The p-value corresponds to a t-test of the null that the means/medians of the two groups are equal against the alternative that the means/medians are significantly different.

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Table: Individual descriptive statistics: High versus low CI index firms

	High CI			Low CI		
	All	Female	Male	All	Female	Male
Monthly Wage (€)	3,476	3,238	3,542	3,041	2,837	3,112
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	0.44	0.43	0.41	0.42	0.41
Education						
Share with college education	0.24	0.29	0.22	0.13	0.15	0.12
Occupation						
Share of white-collar workers	0.52	0.60	0.50	0.33	0.35	0.33
Share of blue-collar workers	0.36	0.27	0.38	0.53	0.50	0.54
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), Export CI`)

Worker-level controls:

- Potential labor marker experience

- Experience^2/100

- University education (`Dummy`)

- Children (`Dummy`)

- White collar (`Dummy`)

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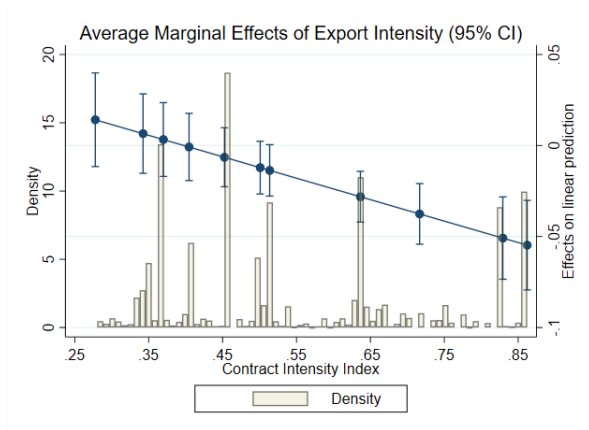# Marginal effects plot: Goods export intensity with firm density

Figure: Goods export intensity

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** (0.035)	-0.045*** (0.017)	-0.061*** (0.022)	-0.139*** (0.043)	-0.125*** (0.043)
Female×Export/Sales	-0.019** (0.008)	-0.026** (0.012)	-0.028** (0.012)	-0.019** (0.008)	-0.017** (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

Notes: Estimates are based on the worker-level panel data over 1997–2015, whereas workers employed in domestic exporting firms are considered. The dependent variable is deflated and annualized wage in log form in columns (1),(2),(4), and (5) and in levels in column (4). Additional control variables included in all specifications are: Experience, Experience^2/100, Children, College, White collar, and Female×ln(Sales). Standard errors clustered at the firm level are in parentheses. Significance levels: *** ($p < 0.01$), ** ($p < 0.05$), and * ($p < 0.1$).

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

Notes: Estimates are based on the worker-level panel data over 1997–2015, whereas workers employed in domestic exporting firms are considered. Additional control variables included in all specifications are: Experience, Experience^2/100, Children, College, White collar, and Female×ln(Sales). Standard errors clustered at the firm level are in parentheses. Significance levels: *** ($p < 0.01$), ** ($p < 0.05$), and * ($p < 0.1$).

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Heterogeneity: White-collar occupations

Table: Occupations

Dep. var: ln(Wage)	White-collar occupations			
	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

Notes: Estimates are based on the worker-level panel data over 1997–2015, whereas workers employed in domestic exporting firms are considered. Additional control variables included in all specifications are: Experience, Experience^2/100, Children, College, and Female×ln(Sales). Standard errors clustered at the firm level are in parentheses. Significance levels: *** ($p < 0.01$), ** ($p < 0.05$), and * ($p < 0.1$).

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