

Working across Time Zones: Exporters and the Gender Wage Gap

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Motivation

- Globalization blamed for increasing inequality
 - What about the gender dimension?
- Women earn less than men - even in Scandinavia
 - holds after controlling for worker characteristics, hours worked full vs. part time and occupation
- Exporters pay higher wages
 - holds after controlling for firm characteristics

Research question

Is the gender wage gap (GWG) higher at exporting firms?

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- Exporters may require a greater commitment from their employees
 - ▶ Late night calls due to **different time zones**
 - ▶ International travel & 24/7 availability
 - ▶ Flexibility: e.g. greater responsiveness to unexpected problems
 - ▶ Survey and empirical evidence on commitment being key to export success

Is the gender wage gap (GWG) higher at exporting firms?

- Exporters may require a greater commitment from their employees
 - ▶ Late night calls due to **different time zones**
 - ▶ International travel & 24/7 availability
 - ▶ Flexibility: e.g. greater responsiveness to unexpected problems
 - ▶ Survey and empirical evidence on commitment being key to export success
- If women are less able to be flexible, or are perceived as such, they may be paid less

Survey evidence on perceived gender differences

- Employer surveys (e.g. from Iceland) reveal that
 - ▶ women are perceived as more family oriented than men
 - ▶ women are perceived as less committed and reliable than men
- A Survey by Slater & Gordon of managers in the UK (2014)
 - ▶ showed that a third of managers claim that women are not as good at their jobs when they come back from maternity leave
- Survey in Harvard Business Review
 - ▶ comparing persons with same qualification: mother deemed less competent than father

Are exporters more commitment intensive?

- Matched employer-employee data from Norway indicate that college educated workers are less likely to take sick leave if employed by an exporter
- True for both men and women

Preview of the results

- The GWG is **lower** at exporting firms, but this result is **reversed** once unobservable worker-firm heterogeneity is controlled for
- In other words, women working for exporters are paid more than other women, but they are underpaid given their unobservable characteristics
- The GWG is systematically related to the **overlap in business hours** with the export markets

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Data 1996-2010

- Firm-level data from Statistics Norway's *Capital database*
 - ▶ unbalanced panel of all joint-stock companies in the Norwegian manufacturing sector
 - ▶ covers around 90% of manufacturing value added and employment
 - ▶ key variables: profits, employment, sector, location
- Employee register
 - ▶ key variables: wages, gender, age, children, education, occupational code (from 2003)
 - ▶ experience calculated from pensions register
 - ▶ full-time workers
- Firm-level customs trade data
- Centrality measure from Norwegian Institute for Urban and Regional Research (size of local labor market, proximity to urban centers)

Baseline model: Controlling for observables

- How large is the gender wage gap when we account for observable worker and firm characteristics?
- Is there a difference in the gender wage gap between exporters and non-exporters?
- A Mincer-type regression:

$$\ln Wage_{ijst} = \beta Fem_i * Exporter_{jt} + X_{it}\lambda + \delta_{st} + \varepsilon_{ijst}$$

where i denotes worker, j firm, s sector, t year

- Worker characteristics: Experience, Experience squared, Education, Children and Centrality

Controlling for observable worker characteristics

	All (1)	All (2)	All (3)	All (4)	College (5)	College (6)	No College (7)	No College (8)
Female*Exporter	.058*** (.007)	.054*** (.006)	-.01** (.005)	-.008# (.005)	-.032*** (.010)	-.030** (.014)	-.008 (.005)	-.004 (.005)
Female	-.269*** (.005)	-.264*** (.004)						
Exporter	.082*** (.006)	-.007*** (.003)	.006* (.004)		.011* (.006)		.006* (.004)	
Education	.059*** (.002)	.051*** (.001)	.063*** (.002)	.063*** (.002)	.063*** (.008)	.061*** (.008)	.075*** (.003)	.075*** (.003)
Experience	.034*** (.000)	.032*** (.000)	.02*** (.008)	.023*** (.007)	.014 (.011)	.021* (.012)	.041*** (.010)	.037*** (.010)
Experience squared	-.058*** (.001)	-.054*** (.001)	-.055*** (.001)	-.054*** (.001)	-.066*** (.002)	-.067*** (.002)	-.051*** (.001)	-.051*** (.001)
Children	-.026*** (.003)	-.019*** (.002)	-.066*** (.006)	-.068*** (.006)	-.035*** (.009)	-.033*** (.010)	-.083*** (.006)	-.084*** (.006)
Centrality	.062*** (.007)	.07*** (.012)	.001 (.007)	.01 (.006)	.010 (.007)	.011 (.010)	-.003 (.008)	-.006 (.005)
Industry-Year FE	Yes	Yes	Yes	No	Yes	No	Yes	No
Firm FE	No	Yes	No	No	No	No	No	No
Spell FE	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Year FE	No	No	No	Yes	No	Yes	No	Yes
Obs	2,713,623	2,713,623	2,713,623	2,713,623	553,611	553,611	2,160,012	2,160,012
R-squared	.40	.47	.75	.83	.81	.89	.70	.80

Notes: Dependent variable is log wage. Estimates are based on the panel of worker-level data for 1996-2010. Standard errors in parentheses clustered on firm. *** = p-val<.01, ** = p-val<.05, * = p-val<.1, # = p-val<.11

Magnitude

- Working for an exporting firm seems to close the gender wage gap by about 6% points (or a fifth)
- Holds even when we allow all the coefficients to vary by export status and gender

But what about differences across firms?

- Control for firm fixed effects
- Identification comes from firms changing their export status
- A Mincer-type regression:

$$\ln Wage_{ijst} = \beta Fem_i * Exporter_{jt} + X_{it}\lambda + \delta_{st} + \delta_j + \varepsilon_{ijst}$$

where i denotes worker, j firm, s sector, t year

- Worker characteristics: Experience, Experience squared, Education, Children and Centrality

... and unobservable firm heterogeneity

	All (1)	All (2)	All (3)	All (4)	College (5)	College (6)	No College (7)	No College (8)
Female*Exporter	.058*** (.007)	.054*** (.006)	-.01** (.005)	-.008# (.005)	-.032*** (.010)	-.030** (.014)	-.008 (.005)	-.004 (.005)
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Firm FE	No	Yes	No	No	No	No	No	No
Spell FE	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Year FE	No	No	No	Yes	No	Yes	No	Yes
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But what about differences in worker ability, etc.?

- Control for **worker-firm (spell) fixed effects**
- Identification comes from workers employed in the firm as the firm changes its export status
- A Mincer-type regression:

$$\ln Wage_{ijst} = \beta Fem_i * Exporter_{jt} + X_{it}\lambda + \delta_{st} + \delta_{ij} + \varepsilon_{ijst}$$

where i denotes worker, j firm, s sector, t year

- Worker characteristics: Experience, Experience squared, Education, Children and Centrality

... and unobservable worker-firm heterogeneity

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Firm FE	No	Yes	No	No	No	No	No	No
Spell FE	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Year FE	No	No	No	Yes	No	Yes	No	Yes
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But what if entry into exporting is not exogenous?

- Control for worker-firm (spell) as well as **firm-year** fixed effects
- Identification comes from workers employed in the firm as the firm changes its export status
- A Mincer-type regression:

$$\ln Wage_{ijst} = \beta Fem_i * Exporter_{jt} + X_{it}\lambda + \delta_{ij} + \delta_{jt} + \varepsilon_{ijst}$$

where i denotes worker, j firm, s sector, t year

- Worker characteristics: Experience, Experience squared, Education, Children and Centrality

... and firm-year unobservables

	All (1)	All (2)	All (3)	All (4)	College (5)	College (6)	No College (7)	No College (8)
Female*Exporter	.058*** (.007)	.054*** (.006)	-.01** (.005)	-.008# (.005)	-.032*** (.010)	-.030** (.014)	-.008 (.005)	-.004 (.005)
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College educated vs. other workers

- Exporters may require a greater commitment from their employees
 - ▶ Late night calls due to **different time zones**
 - ▶ International travel & 24/7 availability .
 - ▶ Flexibility: e.g. greater responsiveness to unexpected problems
- This is more likely to apply to **skilled workers** who negotiate deals with clients, provide technical advice and support, take care of logistics such as transport and customs clearance, etc.

College educated vs. other workers

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Heterogeneity among exporters

- Customs data give us information on the firm's exports by 8-digit HS product and destination country
- We proxy for heterogeneity among exporters using
 - ▶ **Export share**: ratio of exports to total production
 - ▶ **Number of destinations** to which a firm exports in a given year
 - ▶ **Number of exported varieties**: the number of 8-digit HS product-destination country combinations

Heterogeneity among exporters

Table: Exporter descriptives

	Mean	Median	Min	Max
Export share	0.18	0.04	<0.01	1
No of destinations	7.31	3	1	146
No of varieties	24.88	6	1	4,126

Notes: All numbers are based on the panel of firm-level data for 1996-2010. An exporter has by definition exports above NOK 10,000 (USD 1,100). A variety is defined as product-destination combination. <0.01 denotes export share below percent.

Heterogeneity among exporters

	College (1)	College (2)	College (3)	No College (4)	No College (5)	No College (6)
Female*Export share	-.014** (.007)			-.011 (.011)		
Female*Destinations		-.013** (.006)			-.007* (.003)	
Female*No of varieties			-.009** (.004)			-.006** (.002)
Worker Controls	Yes	Yes	Yes	Yes	Yes	Yes
Spell FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Obs	454,063	494,601	494,601	1,620,597	1,712,387	1,712,387
R-squared	.88	.88	.88	.79	.80	.80

Notes: Dependent variable is log wage. Estimates are based on the panel of worker-level data for 1996-2010. Only workers employed by exporting firms are included. Standard errors in parentheses clustered on firm. Worker controls include education, experience, experience squared, children and centrality. *** = p-val < .01, ** = p-val < .05, * = p-val < .1

Magnitudes

- An 10% point increase in the export share is associated with the GWG going up by 13% points for college educated workers
- Adding 4 additional export markets leads to the GWG going up by 5% points
- Adding 10 additional export varieties implies an 8% point increase in the GWG

Business hours overlap

- Compile data on time zone(s) for each export destination country
- For countries spanning multiple time zones, consider only mainland and use the average value
- Calculate the the overlap in business hours between each destination country and Norway assuming the standard 9am to 5pm office hours
- Assume that the need for communications with a particular country increases in the number of traded products, take the average business hour overlap for each firm across country-product combinations in each year

Business hours overlap

Table: Exporter descriptives

	Mean	Median	Min	Max
Export share	0.18	0.04	<0.01	1
Business hour overlap	7.01	7.67	0	8
No of destinations	7.31	3	1	146
No of varieties	24.88	6	1	4,126

Notes: All numbers are based on the panel of firm-level data for 1996-2010. An exporter has by definition exports above NOK 10,000 (USD 1,100). A variety is defined as product-destination combination. <0.01 denotes export share below percent.

Business hours overlap

	All Workers					
	College (1)	College (2)	College (2)	No College (3)	No College (4)	No College (4)
Female*ln Business hours	.028* (.015)		.033** (.015)	.001 (.009)		.001 (.009)
Female*ln Gender index		-.014 (.099)	-.082 (.102)		.006 (.048)	.012 (.052)
Worker Controls	Yes	Yes	Yes	Yes	Yes	Yes
Spell FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Obs	493,736	494,601	493,177	1,708,945	1,709,121	1,705,848
R-squared	.88	.88	.88	.80	.80	.80

Notes: Dependent variable is log wage. Estimates are based on the panel of worker-level data for 1996-2010. O workers employed by exporting firms are included. Standard errors in parentheses clustered on firm. Worker controls include education, experience, experience squared, children and centrality. *** = p-val<.01, ** = p-val<.05, * = p-val<.1

- A 4 hour decrease in the business hour overlap is associated with the GWG increasing by 11% points for college educated women.

Business hours overlap

- But could our result be driven by discrimination against women in the Middle East and Asia?
- Perhaps women are less effective at doing business there and this explains the larger GWG in firms exporting to far away countries?
- To address this issue we control for the **Gender Gap Index** from the World Economic Forum
 - ▶ The index pertains to 2006 and covers 115 countries
 - ▶ The index measures gaps between men and women, rather than absolute levels of female outcomes
 - ▶ It focuses on outcomes rather than input measures.
 - ▶ It rewards countries for closing the gender gap, but neither rewards nor penalizes countries where women have an advantage over men in certain outcomes
 - ▶ As with the Business hour overlap, we take the average of the index over all product-destination country combinations observed in a particular year

Business hours overlap

	All Workers					
	College (1)	College (2)	College (2)	No College (3)	No College (4)	No College (4)
Female* <i>ln</i> Business hours	.028* (.015)		.033** (.015)	.001 (.009)		.001 (.009)
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Spell FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
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Workers under 45 years of age

- Women with young children are likely to be less flexible
- The decision to have children and its timing may be endogenous, so we focus on workers in their reproductive years
- We expect exporting to matter more for the GWG among the group of younger workers

Workers under 45 years of age

	Workers under 45 years of age					
	College (1)	College (2)	College (3)	No College (4)	No College (5)	No College (6)
Female*ln Business hours overlap	.042** (.020)		.049** (.021)	.005 (.012)		-.036 (.080)
Female*ln Gender index		-.027 (.124)	-.129 (.133)		-.030 (.074)	-.036 (.013)
Worker Controls	Yes	Yes	Yes	Yes	Yes	Yes
Spell FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Obs	327,973	328,142	327,559	1,028,554	1,028,674	1,026,584
R-squared	.88	.88	.88	.81	.81	.81

Notes: Dependent variable is log wage. Estimates are based on the panel of worker-level data for 1996-2010. O workers employed by exporting firms are included. Standard errors in parentheses clustered by firm. Worker controls include education, experience, experience squared, children and centrality. *** = p-val < .01, ** = p-val < .05, * = p-val < .1

Robustness checks

- Dummy for one child versus more children
- Controlling for occupational fixed effects
- Allowing the GWG to differ by occupation

Robustness checks

	All Workers					
	College (1)	College (2)	College (2)	No College (3)	No College (4)	No College (4)
Female* <i>ln</i> Business hours overlap	.033** (.015)	.039** (.015)	.039** (.015)	.001 (.009)	-.001 (.017)	-.002 (.017)
Female* <i>ln</i> Gender index	-.082 (.101)	-.128 (.134)	-.128 (.134)	.014 (.053)	.027 (.070)	.028 (.070)
Worker Controls	Yes	Yes	Yes	Yes	Yes	Yes
Controlling for 1 versus 2 children	Yes	No	No	Yes	No	No
Occupation FE	No	Yes	Yes	No	Yes	Yes
Occupation*Female FE	No	No	Yes	No	No	Yes
Spell FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Obs	493,177	288,444	288,444	1,705,848	888,713	888,713
R-squared	.88	.89	.89	.80	.82	.82

Notes: Dependent variable is log wage. Estimates are based on the panel of worker-level data for 1996-2010. O workers employed by exporting firms are included. Standard errors in parentheses clustered on firm. Worker controls include education, experience, experience squared, children and centrality. *** = p-val < .01, ** = p-val < .05, * = p-val < .1

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Worker Controls	Yes	Yes	Yes	Yes	Yes	Yes
Controlling for 1 versus 2 children	Yes	No	No	Yes	No	No
Occupation FE	No	Yes	Yes	No	Yes	Yes
Occupation*Female FE	No	No	Yes	No	No	Yes
Spell FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Obs	493,177	288,444	288,444	1,705,848	888,713	888,713
R-squared	.88	.89	.89	.80	.82	.82

Notes: Dependent variable is log wage. Estimates are based on the panel of worker-level data for 1996-2010. O workers employed by exporting firms are included. Standard errors in parentheses clustered on firm. Worker controls include education, experience, experience squared, children and centrality. *** = p-val < .01, ** = p-val < .05, * = p-val < .1

Alternative explanation: Taste-based discrimination

- All firms would like to engage in taste-based discrimination, but only exporters are profitable enough to do so
- Only most productive exporters sell to far away destinations
- Allow the GWG to differ with profitability, firm size and multinational status

Alternative explanation: Taste-based discrimination

	All workers					
	College (1)	College (2)	College (2)	No College (3)	No College (4)	No College (4)
Female* <i>In Business hours overlap</i>	.028* (.015)		.034** (.015)	.001 (.009)		.001 (.009)
Female* <i>In Gender index</i>		-.014 (.099)	-.082 (.102)		.006 (.048)	.012 (.053)
Female* <i>Profitability</i>	-.000 (.001)	-.000 (.001)	-.000 (.001)	-.002** (.005)	-.002** (.001)	-.002** (.001)
Female* <i>MNC</i>	-.002 (.008)	-.002 (.008)	-.002 (.008)	.002 (.006)	.002 (.006)	.001 (.006)
Female* <i>In Size</i>	-.004 (.008)	-.003 (.008)	-.004 (.008)	-.008 (.005)	-.008 (.005)	-.008 (.005)
Worker Controls	Yes	Yes	Yes	Yes	Yes	Yes
Spell FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Obs	493,736	494,016	493,177	1,708,945	1,709,121	1,705,848
R-squared	.88	.88	.88	.80	.80	.80

Notes: Dependent variable is log wage. *MNC* is a dummy that equals one if the firm is registered as having a positive ownership share in a firm located in a foreign country in the year of observation, and zero otherwise. Estimates are based on the panel of worker-level data for 1996-2010. Standard errors in parentheses clustered on firm. Worker controls include education, experience, experience squared, children and centrality. *** = p-val < .01, ** = p-val < .05, * = p-val < .1

Alternative sample split

- Is there something special about college workers?
- Not really, splitting the sample into **Managers & Professionals & Technicians** vs. **Other Occupations** leads to the same conclusions
- Splitting occupations into those focused on **Cognitive task** vs **Routine tasks** does not
- Supports the flexibility story

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Alternative sample split

	All Workers	
	Managers & Professionals & Technicians	Other Occupations
	(1)	(2)
Female*<i>ln</i> Business hours overlap	.032*	.002
	(.018)	(.016)
Female* <i>ln</i> Gender index	-.011	-.025
	(.096)	(.079)
Worker Controls	Yes	Yes
Spell FE	Yes	Yes
Firm-Year FE	Yes	Yes
Obs	353,725	791,022
R-squared	.89	.80

Notes: Dependent variable is log wage. Estimates are based on the panel of worker-level data for 1996-2010. Only workers employed by exporting firms are included. Standard errors in parentheses clustered on firm. Worker controls include education, experience, experience squared, children and centrality. *** = p-val < .01, ** = p-val < .05, * = p-val < .1

Conclusions

- Globalization matters for gender outcomes
- The GWG is **lower** at exporting firms, but this result is **reversed** once unobservable worker-firm heterogeneity is controlled for
- Put differently, women working for exporters are paid more than other women, but they are underpaid given their unobservable characteristics
- There is heterogeneity within the group of exporters: GWG is systematically related to the **overlap in business hours** with the export markets

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