

# The Gender Wage Gap in the Bangladeshi Garment Sector: Evidence from Administrative Data

Andreas Menzel\*, Chris Woodruff †

\* CERGE-EI, Prague

†University of Oxford

December 15, 2017

# Introduction

Persistent Wage Gap in US, recent progress slowed (Blau and Khan 2016)

Some recent work focuses on narrow occupations

- ▶ Noonan et al (2005), Bertrand et al (2010): Law School/MBA graduates
- ▶ Azmat and Ferrer (2016): Young Lawyers in US

We follow 70.000 workers at 44 Banglad'i Garment Factories over one year

- ▶ Narrow set of standardized occupations
- ▶ Not a traditionally male dominated sector (at least in jobs studied here)
- ▶ One of first studies from Developing country using Administrative Data

# Introduction

Persistent Wage Gap in US, recent progress slowed (Blau and Khan 2016)

Some recent work focuses on narrow occupations

- ▶ Noonan et al (2005), Bertrand et al (2010): Law School/MBA graduates
- ▶ Azmat and Ferrer (2016): Young Lawyers in US

We follow 70.000 workers at 44 Banglad'i Garment Factories over one year

- ▶ Narrow set of standardized occupations
- ▶ Not a traditionally male dominated sector (at least in jobs studied here)
- ▶ One of first studies from Developing country using Administrative Data

We show...

- ▶ a significant wage gap unconditional on position, not explained by observables.
- ▶ male workers reach better paid positions through quicker promotions.
- ▶ quicker promotions largely through more external promotions.

# Data

## Monthly Wage Records from 44 Factories (median 12 months per factory)

- ▶ Monthly base and paid-out salary
- ▶ Worker Position & “Grade”
- ▶ Gender, coded from names  $\Rightarrow$  80% female

## Skills assessments of workers at 15 Factories:

- ▶ number of processes, efficiency for each process, most difficult process,...

## Survey data ( $\sim$ 1,300 worker)

- ▶ Sector tenure, age, education, marital status, children...

# The “Grades”

All factories sort sewing workers in following 7 “Grades”

- ▶ Each grade with own legal minimum wage, increasing in grade

Grade 1: Higher Supervisors

Grade 2: Line (section) supervisors

---

Grade 3: Senior/Multi-skill Machine Operators

Grade 4: General Machine Operators

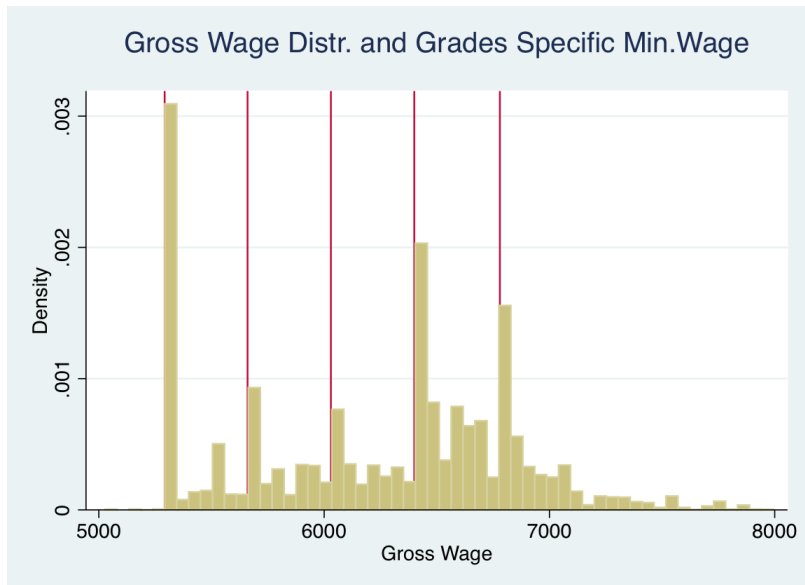
Grade 5: Junior Machine Operators

Grade 6: Ordinary Machine Operator

---

Grade 7: Helper & other entry level positions

# Wage Distribution



# Gender Wage Gap

	(1)	(2)	(3)
VARIABLES	- - - Log Gross Wage - - -		Grade
Female	-0.088*** (0.008)	-0.017** (0.007)	-0.880*** (0.076)
Tenure	0.026*** (0.003)	0.008*** (0.002)	0.214*** (0.036)
Tenure2	-0.001*** (0.000)	-0.000*** (0.000)	-0.006** (0.002)
Constant	8.292*** (0.012)	8.414*** (0.012)	3.182*** (0.073)
Observations	401,401	401,447	401,919
R-squared	0.716	0.909	0.226
Factory-FE	YES	YES	YES
Month FE	YES	YES	YES
Grade FE	NO	YES	-

# Gender Wage Gap, with Absenteeism & Overtime

VARIABLES	Ln Wage	Grade	Ln Wage	Grade
Female	-0.064*** (0.007)	-0.746*** (0.124)	-0.063*** (0.007)	-0.739*** (0.121)
Absent Days/1000			3.235*** (0.880)	30.09*** (8.587)
Att. Bonus/1000			0.156*** (0.023)	1.703*** (0.265)
Overt.Hours/1000			-0.426*** (0.134)	-4.691*** (1.365)
Observations	104,529	104,865	104,529	104,865
R-squared	0.729	0.229	0.739	0.257
Tenure & Tenure <sup>2</sup>	YES	YES	YES	YES
Factory & Month FE	YES	YES	YES	YES



# Gender Wage Gap, with Worker Skills

VARIABLES	Ln Wage	Grade	Ln Wage	Grade
Female	-0.038*** (0.009)	-0.356*** (0.094)	-0.026*** (0.009)	-0.198 ** (0.083)
Average efficiency, tested processes			0.061*** (0.013)	0.820*** (0.157)
# Processes tested			0.003*** (0.000)	0.043*** (0.002)
Most complex process tested			0.006*** (0.001)	0.079*** (0.016)
Tested on process involving physical strength			0.011** (0.003)	0.134** (0.063)
Observations	10,895	10,901	10,895	10,901
R-squared	0.202	0.129	0.276	0.217
Tenure & Tenure <sup>2</sup>	YES	YES	YES	YES
Factory & Month FE	YES	YES	YES	YES

# Gender Wage Gap, with Survey Observables

VARIABLES	Ln Wage	Grade	Ln Wage	Grade
Female	-0.038*** (0.007)	-0.423*** (0.077)	-0.028*** (0.007)	-0.280*** (0.052)
Tenure, RMG sector			0.015*** (0.001)	0.212*** (0.025)
Tenure, RMG Sector <sup>2</sup>			-0.000*** (0.000)	-0.007*** (0.001)
Years schooling			0 (0.001)	0.007 (0.008)
Age			-0.001 (0.001)	0.001 (0.005)
Married			-0.003 (0.004)	0.027 (0.058)
Months per factory, career			-0.005*** (0.002)	-0.071*** (0.022)
Observations	14,352	12,837	14,317	12,806
R-squared	0.675	0.356	0.698	0.450
Tenure & Tenure <sup>2</sup>	YES	YES	YES	YES
Factory & Month FE	YES	YES	YES	YES

# Gender Wage Gap - Children?

We have information on Children only in survey data from 25 factories.

45% of male and 61% of female workers report having children.

8% of males and 4% of female workers report having children younger than 2 y.o.

31% of both male and female workers report having children younger than 5 y.o.

# Gender Wage Gap - Children?

VARIABLES	Ln Wage	Grade	Ln Wage	Grade
Female	-0.029*** (0.008)	-0.386*** (0.104)	-0.021*** (0.007)	-0.251*** (0.090)
Age			-0.001** (0.001)	0.007 (0.013)
Married			-.0013* (0.006)	-0.104 (0.110)
Children			-0.003 (0.016)	-0.406 (0.308)
Children x Female			0.004 (0.017)	0.290 (0.361)
Children < 5yo			0.000 (0.016)	0.445 (0.358)
Children < 5yo x Fem.			0.004 (0.018)	-0.322 (0.414)
Observations	7,484	4,893	7,456	4,878
R-squared	0.313	0.301	0.427	0.416
Tenure & Tenure <sup>2</sup>	YES	YES	YES	YES
Factory & Month FE	YES	YES	YES	YES
Other Observables	NO	NO	YES	YES

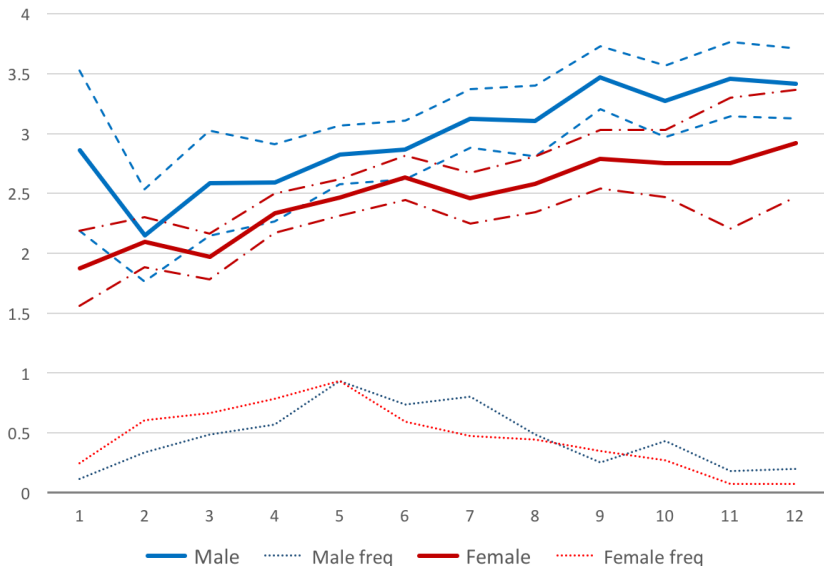
# Decomposing Gender “Grade Gap”

All workers in sample - more or less - start career at Grade 7

What share of grade gap is due to faster promotions vs. longer tenure?

- Male workers in survey report on average one year longer work in sector (6.8 vs 5.8 years).
- Simple decomposition exercise: Predict grade for female and male worker based on years spent in sector in survey
  - ▶ Parametrically: Quadratic (in sectoral tenure) predictor for grade
  - ▶ Non-Parametrically: Expected grade for men and women for 1-year tenure bins
- Combine empirical male tenure distribution with predicted grades for women

# Average Grade and Years in Sector w/ 95% Confidence Intervals & Freq. Distributions



# Decomposing Gender “Grade Gap”

- Different methods indicate up to 20% of grade gap due to different tenure
- Method sensitive to noise in sectoral tenure measure.
  - ▶ But true tenure-grade gradient must be 5 x estimated one to explain grade gap.
  - ▶ True variance of sectoral tenure should be sizeable.
  - ▶ For tenure in factory, we can compare variance from surveys and admin. data:  
Survey data variance only 14% larger  
(Variance of deviation 30% of admin tenure variance).

# Decomposing Gender “Grade Gap”

- Different methods indicate up to 20% of grade gap due to different tenure
- Method sensitive to noise in sectoral tenure measure.
  - ▶ But true tenure-grade gradient must be 5 x estimated one to explain grade gap.
  - ▶ True variance of sectoral tenure should be sizeable.
  - ▶ For tenure in factory, we can compare variance from surveys and admin. data:  
Survey data variance only 14% larger  
(Variance of deviation 30% of admin tenure variance).
- Rest of Grade Gap must be explained by a Gender “Promotion” Gap  
WHY?  $\Rightarrow$  Observables explain at most half of grade gap.  
Discrimination?  
  
Flexibility?



# Decomposing Gender “Grade Gap”

- Different methods indicate up to 20% of grade gap due to different tenure
- Method sensitive to noise in sectoral tenure measure.
  - ▶ But true tenure-grade gradient must be 5 x estimated one to explain grade gap.
  - ▶ True variance of sectoral tenure should be sizeable.
  - ▶ For tenure in factory, we can compare variance from surveys and admin. data:  
Survey data variance only 14% larger  
(Variance of deviation 30% of admin tenure variance).
- Rest of Grade Gap must be explained by a Gender “Promotion” Gap  
WHY?  $\Rightarrow$  Observables explain at most half of grade gap.  
Discrimination?  
 $\rightarrow$  Different Rates of *Internal* Promotions (within factories)?  
Flexibility?  
 $\rightarrow$  Different Rates of *External* Promotions (when changing factories)?

# Internal Promotions, Wage Data

## Annual Int. Promotion Prob. (%)

Grade:	Male	Female Diff.
3	0.29	-0.23
4	5.40	-2.00
5	9.45	1.10
6	5.79	2.37
7	13.25	-1.24

= Monthly probability \* 12

Overall, differential internal promotions do not seem to contribute to "Promotion Gap".

# Annual Promotion Probability, Survey Data

Survey: Nbr. of Promotions / Years

- ▶ Men: 0.363
- ▶ Women: 0.296 (Diff: \*)

How to reconcile with much lower promotions rate in wage data (0.05-0.15 pA)?

- ▶ Most promotions external (when switching factory)?
- ▶ Fits with high factory exit rates: Monthly 6.9% (grade 7) - 3.9% (grade 3)
  - ★ In line with other Asian export manufacturing sectors
- ▶ Males signif. more likely to exit

# Frictions to Switching across factories

VARIABLES	Tenure @ fact	Years/factory
Tenure, RMG sector	0.10 (0.10)	0.46*** (0.09)
Tenure, RMG Sector <sup>2</sup>	0.01 (0.01)	-0.01 (0.01)
Married, no children	0.06 (0.24)	0.32* (0.18)
Married, has child age 5 or younger	-0.22 (0.27)	0.18 (0.18)
Married, all children age 6 or older	0.57* (0.30)	0.55*** (0.17)
Observations	666	666
R-squared	0.387	0.452
Factory-FE	YES	YES
Month FE	YES	YES