

# Why Do Employers Hire Using Referrals? Evidence from Bangladeshi Garment Factories

Rachel Heath

University of Washington and the World Bank

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# Referral hiring

Firms frequently hire using referrals from current workers

- Not much empirical evidence why this is profitable for them
- Knowing why important for policy-makers who want to “undo” network efforts to promote fair job access

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Proposed reason why firms use referrals

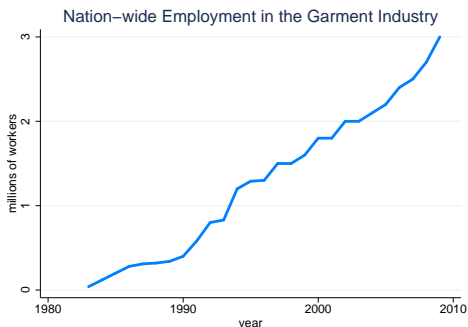
- Nepotism (Goldberg, 1982)
- Reduce search costs (Calvo-Armengol and Jackson, 2004)
- Or minimize an information problem after hiring
  - ▶ Provide information on recipient's unobserved ability (Montgomery, 1991)
  - ▶ **Mitigate a moral hazard problem**

# Referrals and moral hazard

- A limited liability constraint limits the firm's ability to punish the recipient
  - ▶ But recipient works hard if firm can punish provider instead
- Analogous to group liability in microfinance
  - ▶ A formal institution uses social ties between network members to gain leverage over the group
  - ▶ In a microfinance context, Bryan et al (2010) show that social pressure can increase repayment
- Informal institution helps address a market failure due to imperfect information

# Labor in garment factors

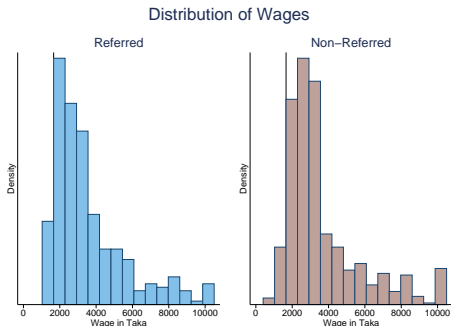
- Average yearly labor force growth of 17.34 percent, 1983 to 2010:



- Effort (which is costly to observe) is important for employers concerned about quality

# Incentives for effort

- Quality checkers learn signals of workers' effort, firms update wages according, but...
- Limited liability (binding minimum wage)



- Short careers, tendency of workers to drop in and out of labor force, and demand shocks decrease the effectiveness of backloaded compensation and efficiency wage

# Referrals

- Referrals are common
  - ▶ 31.9 percent of my sample received a referral in their current job
- Referrals are between close ties

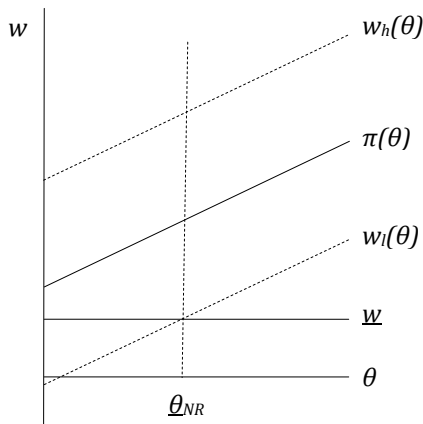
	Number	Percent
Relative, same bari	140	45.2
Relative, different bari	62	20.0
Non relative	108	35.0
Total	310	100

# Model Overview

- Unobserved effort + limited liability (minimum wage/can't charge workers to work)
- Together increase cost of providing incentives for effort, particularly for low-skilled workers
- Referral pairs an observably high-skilled provider whom the firm has more scope to punish with an observably low-skilled recipient
- Dock provider's wages in order to punish recipient without violating the limited liability constraint

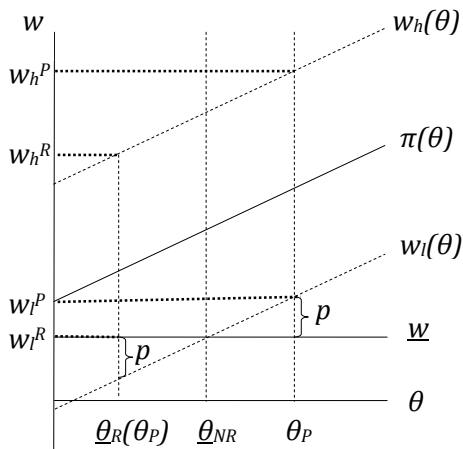


## Baseline case



- $\theta$  is a worker's observable skill
- $\pi(\theta)$  is output from a worker of a given  $\theta$
- $(w_h - w_l)$  must be large enough to make high effort incentive compatible

# Referrals



- $\theta_P$  is the observable skill of the referral provider
- $\theta_R$  is the observable skill of the referral recipient

# Implications

- 1 P on average have higher  $\theta$  than other hired workers
- 2 R on average have lower  $\theta$  than other hired workers
- 3 R and P wages positively correlated in a given time period
- 4 P's wages have larger variance than non-providers of the same  $\theta$

# The survey

- Garment worker supplement as part of a household survey (972 garment workers) [▶ Summary Statistics](#)
- Savar and Dhamrai subdistricts (Dhaka District); Gazipur Sadar and Kaliakur subdistricts (Gazipur District)
- Retrospective information on monthly wage of each worker since she began working
- Sampling unit was the bari, and provider-recipient pairs within bari can be matched

# Implications 1 and 2: Providers observably high skilled, recipients observably low skilled

Use education and experience (at beginning of a working spell) as observable measures of skill:

Dependent Variable	(1) Education	(2) Education	(3) Experience	(4) Experience
referred	-0.670*** [0.253]	-0.611** [0.240]	-0.590*** [0.152]	-0.570*** [0.167]
made referral	0.302 [0.287]	0.256 [0.287]	0.509*** [0.178]	0.485** [0.189]
Mean Dep. Var.	5.909	5.909	4.059	4.059
Factory FE	Y	Y	Y	Y
Bari FE	N	Y	N	Y
Observations	2112	2112	2030	2030
R-squared	0.531	0.629	0.540	0.573

*Education and experience measured in years, defined at the beginning of a worker spell; Regression includes control for male; standard errors in brackets and clustered at the person level; stars indicate significance: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$*

# Testing positive correlation in wages between R and P

- Compare wages  $\tilde{w}_t$  (conditional on observables) between pairs of bari members working in the same factory during the same month
  - ▶ Is there stronger correlation in a pair's wages if there was a referral between the two?

# Testing positive correlation in wages between R and P

- Compare wages  $\tilde{w}_t$  (conditional on observables) between pairs of bari members working in the same factory during the same month
  - ▶ Is there stronger correlation in a pair's wages if there was a referral between the two?
- Difference-in-difference test allows for correlated unobservables
  - ▶ Take two bari members  $i$  and  $j$  between whom there has ever been a referral
  - ▶ Are their wages more strongly correlated (relative to the wages of other bari members) when they're in the factory where the referral has taken place?

$$\begin{aligned}\tilde{w}_{it} &= \gamma_1 \tilde{w}_{jt} \times \text{same factory}_{ijt} \\ &+ \gamma_2 \tilde{w}_{jt} \times \text{referral}_{ijt} \times \text{same factory}_{ijt} \\ &+ \gamma_3 \tilde{w}_{jt} \\ &+ \gamma_4 \tilde{w}_{jt} \times \text{ever referral}_{ij} + u_{it}\end{aligned}$$

## Allowing for within-factory heterogeneity

- Could the  $\tilde{w}_{jt} \times referral_{ijt} \times same\ factory_{ijt}$  effect be driven by within-factory heterogeneity?
  - ▶ e. g., R and P using same machine type, and the factory gets a large order involving heavy use of that machine
- But I include interactions of  $\tilde{w}_{jt}$  and  $\tilde{w}_{jt} \times same\ factory_{ijt}$  with
  - ▶ *same machine<sub>ijt</sub>*
  - ▶ *same position<sub>ijt</sub>*and show that  $\tilde{w}_{jt} \times referral_{ijt} \times same\ factory_{ijt}$  remains positive after allowing for these effects
- Only know whether referral pairs are on same production team (not other pairs), but can include  $\tilde{w}_{jt} \times referral_{ijt} \times same\ factory_{ijt} \times same\ team_{ijt}$  and confirm that referral effect  $\tilde{w}_{jt} \times referral_{ijt} \times same\ factory_{ijt}$  persists when looking at referral pairs on different teams



# Positive correlation in R and P's wages

Dep. Var is wage residual  $\tilde{w}_{it}$ ; sample includes bari members in same and different factories  
(1)

$\tilde{w}_{jt}$	0.2026*** [0.008]
------------------	----------------------

Observations	126744
R-squared	0.055

*The unit of observation is a pair of the wage residual  $\tilde{w}_{it}$  of a bari member and the wage residual  $\tilde{w}_{jt}$  of another bari member working in the garment industry in that month; Columns (2) and (3) include interactions of  $\tilde{w}_{jt}$  with same machine/position that are not shown; Block bootstrap standard errors in brackets; stars indicate significance: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$*

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$\tilde{w}_{jt} \times referral_{ij} \times same\ factory_{ij}$	0.1679* [0.102]

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Dep. Var is wage residual  $\tilde{w}_{it}$ ; sample includes bari members in same and different factories

	(1)	(2)
$\tilde{w}_{jt}$	0.2026*** [0.008]	0.1613*** [0.010]
$\tilde{w}_{jt} \times \text{ever referral}_{ij}$	0.1507* [0.079]	0.1170 [0.088]
$\tilde{w}_{jt} \times \text{same factory}_{ij}$	0.1581*** [0.020]	0.0778*** [0.027]
$\tilde{w}_{jt} \times \text{referral}_{ij} \times \text{same factory}_{ij}$	0.1679* [0.102]	0.1618 [0.110]
$\tilde{w}_{jt} \times \text{same factory}_{ij} \times \text{same machine}_{ij}$		0.1384*** [0.038]

Observations	126744	126744
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# Positive correlation in R and P's wages

Dep. Var is wage residual  $\tilde{w}_{it}$ ; sample includes bari members in same and different factories

	(1)	(2)	(3)
$\tilde{w}_{jt}$	0.2026*** [0.008]	0.1613*** [0.010]	0.1352*** [0.010]
$\tilde{w}_{jt} \times \text{ever referral}_{ij}$	0.1507* [0.079]	0.1170 [0.088]	0.1297 [0.074]
$\tilde{w}_{jt} \times \text{same factory}_{ij}$	0.1581*** [0.020]	0.0778*** [0.027]	0.1405*** [0.024]
$\tilde{w}_{jt} \times \text{referral}_{ij} \times \text{same factory}_{ij}$	0.1679* [0.102]	0.1618 [0.110]	0.1623 [0.109]
$\tilde{w}_{jt} \times \text{same factory}_{ij} \times \text{same machine}_{ij}$		0.1384*** [0.038]	
$\tilde{w}_{jt} \times \text{same factory}_{ij} \times \text{same position}_{ij}$			0.0098 [0.039]
Observations	126744	126744	126744
R-squared	0.055	0.055	0.057

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	(1)	(2)	(3)	(4)
$\tilde{w}_{jt}$	0.2026*** [0.008]	0.1613*** [0.010]	0.1352*** [0.010]	0.2027*** [0.008]
$\tilde{w}_{jt} \times ever\ referral_{ij}$	0.1507* [0.079]	0.1170 [0.088]	0.1297 [0.074]	0.2078*** [0.088]
$\tilde{w}_{jt} \times same\ factory_{ij}$	0.1581*** [0.020]	0.0778*** [0.027]	0.1405*** [0.024]	0.1574*** [0.020]
$\tilde{w}_{jt} \times referral_{ijt} \times same\ factory_{ij}$	0.1679* [0.102]	0.1618 [0.110]	0.1623 [0.109]	0.2232* [0.127]
$\tilde{w}_{jt} \times same\ factory_{ijt} \times same\ machine_{ijt}$		0.1384*** [0.038]		
$\tilde{w}_{jt} \times same\ factory_{ijt} \times same\ position_{ij}$			0.0098 [0.039]	
$\tilde{w}_{jt} \times same\ factory_{ijt} \times same\ team_{ijt} \times referral_{ijt}$				-0.1602 [0.139]
Observations	126744	126744	126744	126744
R-squared	0.055	0.055	0.057	0.058

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## Implication 4: Providers have higher wage variance than non-providers

- 1 Using just current wages, first estimate:

$$\log w_{if} = \beta_0 + \delta_f + x'_{if}\beta + \varepsilon_{if}$$

- 2 Then regress squared residuals on fitted wage and whether they made a referral

	Dep. Var. is $\varepsilon_{if}^2$	
$x'_{if}\hat{\beta}$	0.0566*** [0.0155]	0.0490*** [0.0162]
made referral		0.0220* [0.0114]
Observations	939	939
R-squared	0.015	0.025

*Controls include factory FE, education, experience, experience squared, male; Standard errors in brackets, stars indicate significance: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$*



# Alternative explanations?

- Unobserved type? But we don't see evidence of firms learning more about non-referred workers after hiring
  - ▶ Either via dismissals (no higher turnover among NR workers)
  - ▶ Or via wage updating (the wage variance of NR workers does not increase with tenure relative to that of R workers)

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  - ▶ Either via dismissals (no higher turnover among NR workers)
  - ▶ Or via wage updating (the wage variance of NR workers does not increase with tenure relative to that of R workers)
- Non-wage benefit? But wages of R workers actually increase with tenure relative to NR workers

# Conclusion

- Referrals mitigate a moral hazard problem in garment factories in Bangladesh
- Empirical evidence that provider's wages reflect recipient's output
- Referrals allow firms to hire workers it could not otherwise  $\Rightarrow$  both firms and referral pair benefit
- Cannot undo network effects by providing information about job openings
- An example of how an informal institution can help a market with asymmetric information to function

# Worker Characteristics

	referred	made ref	neither	overall
male	0.436	0.609	0.373	0.433
exper. at start of employment (months)	14.017	26.285	20.376	19.931
education (years)	5.354	6.617	5.799	5.870
all correct on arithmetic test	0.425	0.554	0.528	0.507
age	26.017	28.448	25.369	26.029
has child	0.356	0.474	0.415	0.407
married	0.736	0.865	0.769	0.776
originally from village	0.112	0.100	0.059	0.078
either parent any schooling	0.124	0.100	0.107	0.110
N	306	231	485	972

← Return

# First Stage results

	Dep. Var. is log(wage)	
priorexper	0.0115*** [0.0007]	0.0118*** [0.0008]
priorexper2	-3.93e-05*** [0.0000]	-3.80e-05*** [0.0000]
educ	0.0290*** [0.0052]	0.0300*** [0.0052]
1 correct answers	0.0406 [0.0492]	0.00618 [0.0513]
2 correct answers	0.0679 [0.0545]	0.0217 [0.0499]
3 correct answers	0.100** [0.0452]	0.0931** [0.0436]
Factory FE	N	Y
Observations	4337	4337
R-squared	0.329	0.651

*Experience is in months and education in years; Omitted category is no correct answers; Standard errors in brackets, clustered at person level; stars indicate significance: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$*

# Interactions of referral with position/machine/team

	Dep. Var is wage residual $\tilde{w}_{it}$ (1)
$\tilde{w}_{jt}$	0.2026*** [0.008]
$\tilde{w}_{jt} \times \text{ever referral}_{ijt}$	0.1507* [0.079]
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$\tilde{w}_{jt} \times \text{same factory}_{ijt} \times \text{same machine}_{ijt}$	
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Observations	126744
R-squared	0.055

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$\tilde{w}_{jt} \times \text{ever referral}_{ijt}$	0.1507* [0.079]	0.2078** [0.088]	-0.0806 [0.079]
$\tilde{w}_{jt} \times \text{same factory}_{ijt}$	0.1581*** [0.020]	0.1574*** [0.020]	0.1390*** [0.024]
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$\tilde{w}_{jt} \times \text{same factory}_{ijt} \times \text{same team}_{ijt}$ $\times \text{referral}_{ijt}$		-0.1602 [0.139]	
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$\tilde{w}_{jt} \times ever\ referral_{ijt}$	0.1507* [0.079]	0.2078** [0.088]	-0.0806 [0.079]	-0.0041 [0.079]
$\tilde{w}_{jt} \times same\ factory_{ijt}$	0.1581*** [0.020]	0.1574*** [0.020]	0.1390*** [0.024]	0.0760* [0.027]
$\tilde{w}_{jt} \times referral_{ijt} \times same\ factory_{ijt}$	0.1679* [0.102]	0.2232* [0.128]	0.4563*** [0.173]	0.4040** [0.173]
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$\tilde{w}_{jt} \times same\ factory_{ijt} \times same\ machine_{ijt}$				0.1427*** [0.035]
$\tilde{w}_{jt} \times same\ factory_{ijt} \times same\ machine_{ijt}$ $\times referral_{ijt}$				-0.3762** [0.171]
Observations	126744	126744	126744	126744
R-squared	0.055	0.055	0.057	0.058

# Wage observations

	(ever) referred = 0	(ever) referred = 1	Total
same factory = 0	108,536	652	109,188
same factory = 1	16,946	610	17,556
Total	125,482	1,262	126,744

◀ Return

# Turnover

