The invisibility hypothesis and firm-specific human capital: Evidence from the Finnish finance sector

Bergamo

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Research questions

- What factors affect the probability of promotion?
  - Finnish finance sector
  - Gender differences
  - Education signaling
- Within firm promotions
  - Firm-specific human capital
  - Does job rotation within the firm act as a more important signaling channel for women to increase their promotion probability?

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Motivation

- Gender differences in career outcomes and wages
  - Remains an important area of research in labor economics and public discussion
- Finnish finance sector
  - Particularly interesting setting for research addressing career outcomes
  - Finland is a Nordic country with a fairly high level of gender equality
  - Wage structure is compressed, minimum wage increases set through collective bargaining
  - Unlike prior research on career outcomes in the Finnish private sector, this paper focuses on a sector where the majority of workers are women

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Introduction I

- Invisibility hypothesis (Milgrom and Oster, 1987)
  - Explains why some workers remain "invisible" to future employers
- Promoting a worker sends a positive signal of the worker's ability to other employers
  - Can motivate other employers to try to hire this worker
  - Current employer must increase pay enough to keep the worker
- To avoid paying this premium, the current firm may decide not to promote the worker
  - Leaves this worker "invisible" to outside firms
  - Asymmetric infromation, outside firms infer ability from job assignment (eg. Boganno and Melero, 2015)
  - Ability not visible to outside employers → Do not get promoted

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Introduction II

- Literature: Women more often "invisibles" than men
  - Eg. Milgrom and Oster (1987), Blau and DeVaro (2007)
  - Cassidy, DeVaro and Kauhanen (2016):
    - Emprical results from the Finnish private sector
    - Sample consists of mostly engineers
    - Majority of workers in the sample are men
- Internal labor markets
  - Promotions within firms more frequent than external hires
  - Frederiksen and Kato (2017): Roles experienced within the firm increases the probability of getting a top management job
- Firm-spesific human capital
  - Built through job rotation in the firm

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- Confederation of Finnish Industries (EK)
  - Worker-employer linked wage data
  - 1990-2014
  - Full-time finance sector workers aged 18-65
- Includes information on the hierarchy of jobs
  - Clerical workers, experts and professionals, and managerial workers
  - Promotion defined as a move up from one hierarchy level to another
  - Data set excludes CEO and very top positions
  - Panel data allows to follow individuals over time
- Focus on the finance sector
  - Workers in different hierarchy levels comparable
  - Job titles have similar tasks across firms
  - 75 % of workers in the finance sector are women
  - Much more women in the clerical level jobs than men

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Summary statistics

	Men		Women	
	Mean	SD	Mean	SD
Total monthly wage, Euros	4399.7	2627.41	2657.9	1069.42
No. of job titles	2.5	1.55	2.6	1.52
Promotion, %	3.6		1.8	
Demographics				
Age, years	41.7	9.80	43.3	9.60
Seniority, years	11.7	9.59	15.9	11.09
Education level categories, %				
Secondary level education	44		66	
BA	32		28	
GRAD	24		6	
Job hierarchy levels, %				
Managers	17		2	
Experts and professionals	42		15	
Clerical	41		83	
Observations	229 821		666 762	

Empirical approach I

- Gender differences in the factors affecting the probability of promotion
  - Sample split by gender
- Logit model

$$(Promotion_{it} = 1|\mathbf{X}) = \Lambda(\alpha + \mathbf{X}'_{it}\beta) \quad (1)$$

- Dependent variable promotion: binary variable taking the value 1 if the worker is promoted, 0 otherwise
  - $\Lambda(\cdot)$ is the logistic distributed cumulative distribution function of the probability of promotion of worker i at year t
  - Controls include age and its square, seniority at the firm and its square, education level categories
- Main interest lies in the marginal effects of education controls

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  - $\Lambda(.)$ is the logistic distributed cumulative distribution function of the probability of promotion of worker i at year t
  - Controls include age and its square, seniority at the firm and its square, education level categories
- Main interest lies in the marginal effects of education controls

Empirical approach I

- Gender differences in the factors affecting the probability of promotion
  - Sample split by gender
- Logit model

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Empirical approach II

- Signaling role of firm-specific human capital (following Frederiksen and Kato (2017))

$$(Promotion_{it} = 1|\mathbf{X}) = \Lambda(\alpha + \mathbf{Roles}_{it}^{'}\gamma + \mathbf{X}_{it}^{'}\beta) \tag{2}$$

- Number of job titles held within the firm added to the model
  - The probability of promotion is expected to increase in the number of roles experienced in the firm
  - Comparing the magnitude of the marginal effects from the number of job title dummies between men and women
  - Sample split by the education level

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Results I

	General promotion		Manager promotion	
	Men (1)	Women (2)	Men (3)	Women (4)
BA	0.012***	0.012***	0.010***	0.005***
	(0.001)	(0.001)	(0.001)	(0.000)
GRAD	0.011***	0.019***	0.018***	0.010***
	(0.001)	(0.001)	(0.001)	(0.000)
Observations	193 701	568 623	193 701	568 623

Cluster robust standard errors in parentheses, clustered at individual level. All regressions include controls for age and its square, seniority at the firm and its square, capital area dummy, and year controls.

Results II

	GRAD		BA		Secondary	
	Men (1)	Women (2)	Men (3)	Women (4)	Men (5)	Women (6)
3 Roles	0.083***	0.095***	0.078***	0.063***	0.074***	0.033***
	(0.004)	(0.005)	(0.003)	(0.002)	(0.003)	(0.001)
5 Roles	0.098***	0.114***	0.094***	0.078***	0.087***	0.042***
	(0.004)	(0.005)	(0.004)	(0.002)	(0.004)	(0.002)
7 Roles	0.109***	0.122***	0.102***	0.090***	0.094***	0.050***
	(0.006)	(0.007)	(0.005)	(0.003)	(0.005)	(0.002)
9 or more roles	0.120***	0.133***	0.121***	0.102***	0.100***	0.056***
	(0.007)	(0.008)	(0.007)	(0.004)	(0.007)	(0.002)
Observations	47544	33214	66439	166848	79718	368561

Cluster robust standard errors in parentheses, clustered at individual level. All regressions include controls for age and its square, seniority at the firm and its square, capital area dummy, and year controls.

Conclusions

- This paper investigates the gender differences in promotion probabilities in the Finnish finance sector
  - Graduate level education increases the probability of promotion for both women and men
  - However, the effect is much smaller than in prior research, especially for women (Cassidy et al.(2016))
  - Graduate level education can alleviate the invisibility of women, but in a sector where the majority of workers are women, the effect is small
- The probability of promotion increases with the number of job titles experienced within the firm
  - Firm-specific human capital increases the probability of promotion more for men than for women
  - Only for workers with a graduate degree, the promotion probability increases more for women than for men, however, the differences are quite small

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