Labor Market Signaling and Self-Confidence: Wage Compression and the Gender Wage Gap

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May 3, 2012

Outline

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  - Men are more overconfident than women.
- Do these biases in beliefs affect economic outcomes?

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  - Santos-Pinto (2008): Shows how firms can write optimal contracts to take advantage of overconfidence.

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  - Kaniel & Massey (2010): Find that optimistic MBA students spend less effort searching and are offered jobs more quickly than pessimists with similar skills.

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- Worker's utility: $u(w, e, \theta) = w - c(e, \theta)$
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  - $\nu \in [0, \lambda]$ be the fraction of underconfident workers.
  - $\kappa \in [0, 1 - \lambda]$ be the fraction of overconfident workers.
- Firms cannot observe a worker's productive ability and beliefs, but know λ, ν and κ.

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  - Among all workers who choose e^{HO} firms know that fraction $\beta = \frac{\kappa}{\lambda+\kappa-\nu}$ has low ability and $1-\beta$ has high ability.

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- A firm's strategy is:

$$w(e) = \begin{cases} (1-\alpha)y(e,\theta_L) + \alpha y(e,\theta_H) & \text{if } e < e^{HO} \\ \beta y(e,\theta_L) + (1-\beta)y(e,\theta_H) & \text{if } e \geq e^{HO} \end{cases}$$

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- If workers are sufficiently similar in terms of productivity and cost of education, then:
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Outline

Introduction

The Model

Wage Compression

The Gender Pay Gap

Welfare Analysis

Conclusion

Wage Compression

- Wage compression is a key feature of imperfect labor markets and has important consequences for market efficiency.
- Acemoglu & Pischke (1999) demonstrate that it may encourage employers to offer and pay for general training.
- Lindquist (2005) shows that even low degrees of wage compression lead to large welfare losses from costly unemployment among low-skilled workers.

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  - Lazear (1989), Milgrom & Roberts (1990): Wage inequalities may give rise to destructive rent-seeking behavior within firms.
  - Akerlof & Yellen (1990): Large wage differentials may be perceived as unfair and lead to reduced effort.

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From the FOC, the SOC, and $y_{e\theta}\geq 0$ we have:

$$\frac{\partial e^{LU}}{\partial \alpha}=-\frac{y_e(e,\theta_H)-y_e(e,\theta_L)}{(1-\alpha)y_{ee}(e,\theta_L)+\alpha y_{ee}(e,\theta_L)-c_{ee}(e,\theta_L)}\geq 0$$

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$\hat{e}^{HO}$ is such that the icc of LU workers binds:

$$u^*(\sigma, \alpha) = \beta y(\hat{e}^{HO}, \theta_L) + (1 - \beta) y(\hat{e}^{HO}, \theta_H) - c(\hat{e}^{HO}, \theta_L)$$

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A contradiction to $u^*(\sigma,\alpha) > u^*(\theta_L)$. Hence, $\hat{e}^{HO} < \hat{e}^{H}$.

Corollary 1

(ii) If workers are sufficiently similar in terms of productivity and cost of acquiring education and the fraction of biased workers is sufficiently small, then

$$\triangle \hat{w}^B < \triangle \hat{w}^R$$
$$(\triangle \bar{w}^B < \triangle \bar{w}^R)$$

that is, the wage spread in the least (most) cost separating equilibrium with biased workers is smaller than the wage spread in the least (most) cost separating equilibrium with rational workers.

Outline

The Gender Pay Gap

- Empirical evidence shows that, on average, women are paid less than men.
- This is known as the gender pay gap. Blau & Kahn (2000) and Borjas (2008).
- The gender pay gap may be statistically decomposed into two components:
  - one due to gender differences in measured characteristics,
  - the other due potentially to discrimination.

The Gender Pay Gap

- Various explanations have been offered to justify the existence of a gender pay gap:
  - Differences in human capital (Mincer & Polachek, 1974).
  - Differences in risk aversion (Eckel & Grossman, 2003).
  - Discrimination due to preferences of employers (Becker, 1971).
  - Statistical discrimination (Rothschild & Stiglitz, 1982).

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  - Paglin & Rufolo (1990) report that the propensity of women to choose less mathematical college majors can account for the entire gender wage gap among college graduates.
  - Koellinger et al. (2007) find that women's lower propensity to start businesses than men, is highly correlated with women's lower levels of optimism and self-confidence.

The Gender Pay Gap

- Let labor supply be composed of males and females
- Assume that, before investment in education, males and females are equally productive.
- The mean wage paid to males is equal to:

$$w_m = (1 - \lambda - \kappa_m + \nu_m) w_m^{LU} + (\lambda + \kappa_m - \nu_m) w_m^{HO}$$

- The mean wage paid to females is equal to:

$$w_f = (1 - \lambda - \kappa_f + \nu_f) w_f^{LU} + (\lambda + \kappa_f - \nu_f) w_f^{HO}$$

- The gender pay gap is given by $w_g = w_m - w_f$

Proposition 4

Let $y(e,\theta) = e + \theta$, $c(e,\theta) = e^2/2\theta$, $\kappa_m \in (0, 1-\lambda]$, $\nu_f \in (0, \lambda]$, *and* $\kappa_f = \nu_m = 0$.

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(i) If workers are sufficiently different in terms of productivity and cost of acquiring education, i.e., $\frac{\theta_H}{\theta_L} > 3 - 2\min\left[\alpha_f, \beta_m\right]$, *then* $w_f^* < w^* < w_m^*$.
(ii) If workers are sufficiently similar in terms of productivity and cost of acquiring education, i.e., $\frac{\theta_H}{\theta_L} < 3 - 2\max\left[\alpha_f, \beta_m\right]$ *and*
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(b) $\lambda > \frac{2}{3}$, *and* $\frac{\kappa_m}{\nu_f} > \frac{3\lambda - 2}{1 - \lambda}$, *then* $\hat{w} < \hat{w}_f < \hat{w}_m$.

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The Gender Pay Gap

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- The gender wage gap is due to differences in measured characteristics: differences in educational investments of males and females.
- If men are overconfident and women underconfident, then men will, on average, acquire a higher education level than women.
- If education raises productivity, i.e., $y_e > 0$, then men will, on average, earn more than women.

Outline

Welfare Analysis

- Welfare in the standard model (all workers are rational) is:

$$W^R = \lambda u(w(e^H), e^H, \theta_H) + (1-\lambda)u(w(e^L), e^L, \theta_L)$$

- To evaluate the utility of a biased worker I take the perspective of an outside observer who knows the worker's actual marginal cost of acquiring education.
- Welfare with biased workers is:

$$\begin{aligned} W^B = {} & (\lambda-\nu)u(w(e^{HO}), e^{HO}, \theta_H) + \nu u(w(e^{LU}), e^{LU}, \theta_H) \\ & + \kappa u(w(e^{HO}), e^{HO}, \theta_L) + (1-\lambda-\kappa)u(w(e^{LU}), e^{LU}, \theta_L) \end{aligned}$$

Proposition 6

If all biased workers are overconfident and workers are sufficiently similar in terms of productivity and cost of acquiring education, then $\hat{W}^B < \hat{W}^R$*, i.e., welfare in the least cost separating equilibrium with overconfident workers is smaller than welfare in the least cost separating equilibrium with rational workers.*

Proposition 7

If $y(e, \theta) = \theta$, $c(e, \theta) = c^{\gamma}/\theta$, *with* $\gamma > 1$,

$$\kappa < \frac{(1-\lambda)\theta_L}{(1-\lambda)\theta_L + \lambda\theta_H}$$

and

$$\lambda(1-\kappa)\frac{\rho}{\theta_H} \leq \nu < \lambda(1 - \frac{\kappa}{1-\lambda})$$

then $\hat{W}^B > \hat{W}^R$*, i.e., welfare in the least cost separating equilibrium with biased workers is higher than welfare in the least cost separating equilibrium with rational workers.*

Welfare Analysis

- The reason why biased beliefs can raise welfare are similar to those why a tax-subsidy schedule applied to wages in the least cost separating equilibrium of Spence's model can raise welfare.
- Overconfidence is like a tax on the education of unbiased high-ability workers which brings their education level closer to the optimal.
- Underconfidence is like a subsidy for unbiased low-ability workers because it raises their wage for a given education level.

Outline

Conclusion

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  - Workers' biased beliefs compress wages.

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Thank You for your Attention

Questions or comments are welcome