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Tweaking Becker (1957): Models of Taste-Based Discrimination

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Taste-Based Discrimination

- The Becker (1957) model is a natural starting point for thinking about the (sizable) wage gaps observed across demographic groups
  - Prejudiced firms act as if minorities/women are more expensive to hire
- ...but also raises (at least) two big puzzles:
  - Why aren’t prejudiced firms, who sacrifice some profit for their taste, driven out of the market? (Arrow, 1972)
  - Why is there a wage gap if (hopefully) prejudice is rare? (Cain, 1986)
- The models of Goldberg (1982) and Black (1995) address these two points, respectively, in a tractable way
  - Reformulate prejudiced firms as receiving positive utility from hiring whites, rather than disutility from hiring minorities (Goldberg, 1982)
  - Embed taste-based discrimination in a search model (Black, 1995)
- Intellectual history of discrimination is *fascinating* (and fairly young)
  - Taste-based discrimination only part of the story
  - A lot still to do (especially in testing across theories)
Review of Taste-Based Discrimination

- Two groups, both alike in production ($w$ and $b$; perfect substitutes)
- Suppose a unit mass of firms; prejudiced firms have utility:
  \[ U = \pi - d_b W_b L_b \]
  \[ = Q(L_w + L_b) - W_w L_w - (1 + d_b) W_b L_b \]
  where other firms (with $d_b = 0$) just care about profits, $\pi$.
- Assume $W_b < W_w$; $w$ workers hired until $W_w = Q'(L_w)$; firms for which $W_m > W_b(1 + d_b)$ hire $L_b = Q'^{-1}(W_b(1 + d_b))$ workers.
- Profits/utility of all firms with $d_b > (W_m - W_b)/W_b$ fixed at
  \[ \pi = U = Q(Q'^{-1}(W_w)) - W_w Q'^{-1}(W_w) \]
  while less discriminating firms have profits and utility of
  \[ \pi = Q(Q'^{-1}(W_b(1 + d_b))) - W_b Q'^{-1}(W_b(1 + d_b)) \]
  \[ U = Q(Q'^{-1}(W_b(1 + d_b))) - (W_b(1 + d_b)) Q'^{-1}(W_b(1 + d_b)) \]
“Sellout price” (utility) monotonically decreasing (when $Q$ concave)

Firms with lower $d_b$ should be able to buy out those with higher $d_b$; only least-discriminatory (i.e. least-cost) firms should survive
From Discrimination to “Nepotism”

- In Goldberg (1982), firms receive positive utility from employing \( w \) workers, rather than disutility from hiring \( b \) workers
  - “Nepotistic” firms willing to pay from profits for non-pecuniary gain of indulging their preferences (recall “harassment” model)
  - Key (implicit) assumption: no cheaper way for employers to indulge preferences outside the labor market (e.g. prostitution in the harassment model)

- Utility now \( U = Q(L_w + L_b) - (1 - d_w)W_wL_w - W_bL_b \)

- Again assume \( W_b < W_w \); firms with \( d_w < \frac{W_w - W_b}{W_w} \) only hire \( b \) workers; profits and utility now:

\[
\pi = Q(Q'^{-1}(W_w(1 - d_w))) - W_w Q'^{-1}(W_w(1 - d_w)) \\
U = Q(Q'^{-1}(W_w(1 - d_w))) - (W_w(1 - d_w))Q'^{-1}(W_w(1 - d_w))
\]
Profits must be decreasing in $d_w$; nepotistic firms distort input choices, hiring expensive $w$ workers rather than cheaper $b$ workers.

However, these losses in profit are more than made up for by gains in utility (since increases in $d_w$ increase $L_w$)
Nepotism Intuition and Takeaways

- In both Becker (1957) and Goldberg (1982), preferences per se are not arbitraged by the market
  - In Becker (1957), firms that are disadvantaged in profitability are also hurt in terms of utility
  - In Goldberg (1982), firms are more than compensated for inefficiency

- A key assumption that makes Goldberg (1982) work is that firms can’t “purchase” nepotism except by hiring workers
  - Equilibrium will involve DWL; breaking work-nepotism linkage can restore efficiency (like on the problem set)

- Charles and Guryan (2008) show another way around the Arrow crit.
  - Prejudiced employers who sell their business have to find new work, potentially among minority group members
  - Psychic cost of being a racist working with blacks may be enough to compensate for lost profits/utility from not hiring cheaper black labor
Taste-Based Discrimination and Search

- So far we’ve been assuming $W_b < W_w$ and analyzing an equilibrium consistent with a prevailing wage gap.
- But this is not automatic, even in Becker’s original formulation:
  - Recall compensating differentials intuition: the *marginal* firm and worker set the “white wage premium.”
  - If prejudice relatively rare, the marginal firm will be unprejudiced; competition among unprejudiced firms that hire both groups will ensure $W_b = W_w$.

- What explains persistent wage gaps with falling prejudice?
  - Lundberg and Startz (1983): statistical discrimination and endogenous human capital investment (see also Milgrom and Oester (1987))
  - Borjas and Bronars (1989) and Black (1995): search

- Black (1995) intuition: discriminating firms reduce gains to search for $b$ workers, which unprejudiced firms take advantage of:
  - Even if unprejudiced firms hire $b$ workers, $W_b < W_w$ whenever any prejudiced firms remain in the market.
The Model

- Two firm types (frac. $\theta$ prejudiced); two worker types ($\gamma$ type- $b$)
  - Workers have marginal product $V$ and outside option $U_h$
  - Prejudiced firms hire $w$ and pay $W_p^w$, others pay $(W_u^w, W_u^b)$
  - Workers have job satisfaction $\alpha \sim F$, with $\frac{1-F(a)}{f(a)}$ strictly decreasing

- Paying $\kappa$ for each job draw, can show $w$ workers value search by

\[
U^w = \theta E[\max\{W_p^w + a, U^w\}] + (1 - \theta) E[\max\{W_u^w + \alpha, U^w\}] - \kappa
\]
\[
= \frac{\theta \int_{\alpha_p^w}^{\infty} (W_p^w + \alpha) f(\alpha) d\alpha + (1 - \theta) \int_{\alpha_u^w}^{\infty} (W_u^w + \alpha) f(\alpha) d\alpha - \kappa}{1 - \theta F(\alpha_p^w) - (1 - \theta) F(\alpha_u^w)}
\]

where $\alpha_j^w \equiv u_r^w - W_j^w$ for reservation utility $u_r^w$

- Reservation utility such that workers are indifferent between accepting a job at the res. utility level and continuing search: $u_r^w = U^w$
$w$-Worker Search (cont.)

- Can show with some algebra $u_r^w$ satisfies (if $u_r^w > U_h$)

$$
\kappa = \theta \int_{\alpha_p^w}^{\infty} (W_p^w + \alpha - u_r^w) f(\alpha) d\alpha + (1 - \theta) \int_{\alpha_u^w}^{\infty} (W_u^w + \alpha - u_r^w) f(\alpha) d\alpha
$$

That is, the cost of search equals the expected gains

- Standard comparative statics:

$$
\frac{\partial u_r^w}{\partial W_p^w}, \frac{\partial u_r^w}{\partial W_u^w} \in (0, 1)
$$

$$
\frac{\partial u_r^w}{\partial \theta} \geq 0 \text{ as } W_p^w \geq W_u^w
$$

- Expected number of searchers:

$$
\nu^w = (\theta(1 - F(u_r^w - W_p^w)) + (1 - \theta)(1 - F(u_r^w - W_u^w))^{-1}
$$
**b-Worker Search**

- $b$ workers only hired by prejudiced firms. Value of search:

$$U^b = \theta U^b + (1 - \theta)E[\max\{W^b_u + \alpha, U^b\}] - \kappa$$

$$= (1 - \theta) \int_{\alpha^b}^{\infty} (W^b_u + \alpha)f(\alpha)d\alpha - \kappa$$

- Reservation utility satisfies

$$\frac{\kappa}{1 - \theta} = \int_{\alpha^b}^{\infty} (W^b_u + \alpha - u^b_r)f(\alpha)d\alpha$$

$\kappa/1-\theta$: expected search cost of locating unprejudiced firm

- Now have $\frac{\partial u^b_r}{\partial W^b_u} = 1$, $\frac{\partial u^b_r}{\partial \theta} < 0$, and expected searches

$$\nu^b = ((1 - \theta)(1 - F(u^b_r - W^b_u))^{-1}$$
Firm Behavior

- Linear production; firms maximize expected per-applicant profit

\[ \pi_j^i = \frac{1}{2} (1 - F(u_r^i - W_j^i)) \left( V - W_j^i \right) \]

prob. of acceptance value

Where \( p \) firms only hire \( w \) workers. FOC:

\[ V - W_u^i = \frac{1 - F(u_r^i - W_u^i)}{f(u_r^i - W_u^i)} \]

- Implies \( W_p^w = W_u^w \equiv W^w \); both firms treat \( w \) workers the same.

Thus (from before) \( \frac{\partial u_r^w}{\partial \theta} = 0 \). However, profit maximization implies

\[ \frac{\partial W_u^b}{\partial u_r^b} \in (0, 1) \]

Thus \( \frac{\partial W^b}{\partial \theta} = \frac{\partial W^b}{\partial u_r^b} \frac{\partial u_r^b}{\partial \theta} < 0 \), and \( \omega^b < \omega^a \) whenever \( \theta > 0 \)
Black (1995) Intuition

- Unprejudiced firms are not racist, but they are profit-maximizing
  - Differential search costs give firms a degree of monopsonistic power
  - Since firms know \( b \) workers face higher costs, they will exploit this power to offer them a lower wage
  - Even though no prejudiced firm hires \( b \) workers, they have an indirect effect on wages through search
  - In a sense, the whole market is prejudiced if any firms are

- Black (1995) closes the model with entry; as in Becker (1957) competition limits entry of prejudiced firms, but as in Goldberg (1982) those that enter trade off profits for discrimination
  - \( W/\text{fraction } \rho \) of potential prejudiced firms shows \( \frac{\partial W^b}{\partial \rho} = \frac{\partial W^b}{\partial \theta} \frac{\partial \theta}{\partial \rho} < 0 \)
  - Also shows \( \frac{\partial \alpha^b}{\partial \rho} < 0 \), so “match quality” (both expected and realized) of \( b \) workers declines in potential discrimination
  - Wage differentials understate utility loss from discrimination, because \( b \) workers both receive lower wages and are worse-matched to firms
Takeaways

- Taste-based discrimination a natural start for modeling $W^b < W^w$
  - Models often very tractable (statistical discrimination models usually involve more parametrizations)
  - Original Becker intuition essentially compensating differentials
  - Arrow (1972) and Cain (1986) critique can be patched while keeping the model transparent

- Policy prescriptions (besides mandating $W^b = W^w$) can be different across models
  - Goldberg (1982): break nepotism-production link
  - Black (1995): “flag” discriminatory firms for $b$ workers to direct-search

- Empirically distinguishing discrimination models notoriously difficult
  - Even harder when we throw statistical discrimination in the mix...