Recitation 11: Discrimination
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Outline

1 Taste-Based vs. Statistical Discrimination

2 Inaccurate Statistical Discrimination (Bohren et al. (2019))

3 Reducing Discrimination
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3 Reducing Discrimination
Taste-Based Discrimination: Becker 1957

- “Taste for discrimination”: employers get disutility from hiring women, $f$, but not men, $m$
- Employers maximize their utility, which is profit minus a cost for employing women

$$U = pF(N_m + N_f) - w_m N_m - w_f N_f - dN_f$$

- $p$ is the price of the good that the firm makes
- $F$ is the production function of the firm
- $w_x$ is the wage for group $x$
- $N_x$ is the number of employees of group $x$
- $d$ is the taste-based discrimination parameter
Taste-Based Discrimination: Wage Discrimination

- Employers solve
  \[
  \max_{N_m, N_f} pF(N_m + N_m) - w_m N_m - w_f N_f - dN_f
  \]

- First–order conditions
  \[
  pF' = w_m \text{ and } pF' = w_f + d
  \]

- Prejudiced employers \((d > 0)\) only hire women if
  \[
  w_m \geq w_f + d
  \]

- Why? Women and men are perfect substitutes in production, and the effective women’s wage for prejudiced employers is \(w_f + d\). If they hire women, men's wages must be at least as high as this effective wage for women.
Suppose that different employers have different values for $d$

If there are a lot of prejudiced employers ($d > 0$), then:
- There are women who work for prejudiced employers
- There is a wage gap for these women: $w_f = w_{rm} - d$
- If markets are competitive, then non-prejudiced employers will grow (because they can arbitrage the wage gap)
- If markets are competitive, prejudiced employers will make less profit
Statistical Discrimination: Aigner and Cain (1977)

- Distinct from taste-based discrimination
- Employers observe a noisy measure, $y$, of true productivity, $q$
- Thus employers may want to use observable characteristics (e.g., gender) to infer expected productivity (assuming productivity is correlated with gender)
- A simple case:

\[
\begin{align*}
    y &= q + u \\
    q &\sim N(\alpha, \sigma_q^2) \\
    u &\sim N(0, \sigma_u^2) \\
    q \text{ and } u \text{ are independent}
\end{align*}
\]
Statistical Discrimination: Wage Discrimination

- Employers infer average productivity $q$ based on measure $y$

$$E(q|y) = (1 - \gamma)\alpha + \gamma y$$

with $\gamma = \frac{\sigma_q^2}{\sigma_q^2 + \sigma_u^2}$

- Comes from property of bivariate normal distribution

- Suppose that women are more productive than men: specifically, $q_f \sim N(\alpha_f, \sigma_q^2)$ and $q_m \sim N(\alpha_m, \sigma_q^2)$ with $\alpha_f > \alpha_m$

- Suppose employers pay workers their expected productivity: a man and a woman who have measured productivity $y$ are paid $(1 - \gamma)\alpha_m + \gamma y$ and $(1 - \gamma)\alpha_f + \gamma y$ respectively

  - There is equal pay for equal expected productivity.
  - There is not equal pay for equal productivity.
  - There is not equal pay for equal measured productivity.

    - Even if $y$ is the same, the wage gap is $(1 - \gamma)(\alpha_f - \alpha_m)$

  - Subtle point: each group is paid its average productivity
Taste-Based and Statistical Explanations

What are taste-based and statistical explanations for the following?

- An American tourist gets quoted higher prices at foreign flea markets
- A teenager receives a low number of callbacks for job applications
- A woman receives a high quote from a car mechanic
Testing for Discrimination

- Many approaches to testing for discrimination (not all distinguish taste-based from statistical)
- Two approaches to documenting discrimination from Frank’s lecture
  - Correspondence studies
  - Quasi–experiments
- Another approach to distinguishing taste-based and statistical discrimination:
  - Look for differences in productivity across groups
  - If none, then infer discrimination is taste-based
  - If productivity differences exist, then are they large enough to explain discrimination?
  - What might be a potential problem with this approach?
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Inaccurate Statistical Discrimination: Bohren et al. (2019)

- Recent papers distinguish between accurate and inaccurate statistical discrimination.
- If we ignore possibility of inaccurate statistical discrimination, we may incorrectly understand discrimination:
  - Suppose we study wage discrimination
  - We look at the productivity for the majority and minority group and find no differences
  - Suppose we only consider taste-based and (classical) statistical discrimination
  - Cannot be (classical) statistical discrimination because there are no underlying differences in productivity (so group is not correlated with productivity)
  - However, employers may falsely believe there are productivity differences
- Bohren et al. (2019) run an experiment and show that inaccurate statistical discrimination can be falsely interpreted as taste-based discrimination.
Inaccurate Statistical Discrimination: The Experiment

Overview of the experiment

- 589 workers from India and the USA do a 50 question math test
- 577 employers shown 20 worker profiles and asked how much they would pay each
- Sample profile:
  - Country: USA
  - Gender: Female
  - Age: 63
  - Favorite High School Subject: English
  - Favorite Sport: Gymnastics
  - Favorite Color: Sea Green
  - Favorite Movie: Overboard
  - Prefers Tea/Coffee: Tea

- If an employer hires a worker, they are paid proportionally to the number of correct questions
- Last, ask employers questions about beliefs
  - “On average, how many math questions out of 50 do you think X answered correctly?”
  - X is, for example, people from India
Inaccurate Statistical Discrimination: Results

- First, employers discriminate: Indians and men receive higher wage offers
- In this experiment, workers from India and the USA perform equally well on the math test (no productivity differences)
- This rules out (classical) statistical discrimination
- So are employers prejudiced against workers from the USA?
- Using belief elicitation survey, they find employers mistakenly believed that workers from India would perform far better than workers from the USA
- Accounting for these productivity beliefs, there is taste-based discrimination against workers from India
- How could we reduce inaccurate statistical discrimination?
- Bohren et al. provide information on average math score and it reduces discrimination
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Reducing Discrimination

How might we reduce discrimination?

Some possibilities:
- Laws, e.g., Civil Rights Act of 1964
- Policies, e.g., blind interviewing
- Algorithms
- Intergroup contact, e.g., Rao 2019
- Defaults that reduce discretion
- Others?