Labor Market Discrimination

Definition

- Individual workers who have identical productive characteristics are treated differently because of the demographic groups they belong to
  - hiring and firing
  - wages and benefits
  - promotion
  - workplace harassment
  - occupational segregation

Broader Context

- State-sponsored discrimination
- Pre-labor market discrimination
- Social attitudes

Measurement

- Relevant productive characteristics are difficult to observe and to verify
- Discrimination intent is also difficult to establish
- Hiring quotas are easier to enforce
- Lawsuits over firing are more common than those over hiring

Occupational Dissimilarity

- Index of occupational dissimilarity

$$\sum_i \frac{|f_i - m_i|}{2}$$

- f_i is percent of all women working in occupation i ($\sum_i f_i = 1$). m_i is percent of all men working in occupation i ($\sum_i m_i = 1$)
- The index shows the minimum fraction of workers who would have to change occupations to achieve full gender equality in occupational structure
- Occupational dissimilarity need not be entirely due to discrimination; preferences also play a part
- Shopfloor assistants vs. checkout cashiers at HomeDepot

Wage Discrimination

- Raw gender wage gap:
$$\Delta w = \overline{w}_m - \overline{w}_f$$
- Use logarithm of wages for w to measure percentage wage gap
- Gender earnings gap can be larger than gender wage gap because part time work is more prevalent among women

Gender Gap in OECD Countries

TABLE 4.2 Gender employment gap, gender earnings gap, and share of women in boards of large firms

Country	Employment gap 2017 (%)	Median earnings gap 2016 (%)	Change in gap (%)		Share of women boards, large firms 2019	Gender quota 2019
			Employment 2000–2017	Median wage 2000–2015		
Australia	13	14	−38	−24	31	No
Austria	10	16	−55	−26	31	Yes
Belgium	13	4	−50	−65	36	Yes
Canada	7	18	−46	−22	29	No
Chile	27	—	−45	—	8	No
Czech Republic	18	16	−20	18	9	No
Denmark	7	6	−38	—	30	Yes
Estonia	9	—	−20	—	9	No
Finland	4	17	−49	−11	34	No
France	10	—	−48	—	45	Yes
Germany	9	16	−54	−19	36	Yes
Greece	29	5	−30	—	10	No
Hungary	18	9	−12	−33	13	No
Iceland	5	—	−33	—	46	Yes
Ireland	14	11	−52	−27	26	No
Israel	10	22	−51	—	22	Yes
Italy	27	6	−35	—	36	Yes
Japan	19	25	−37	−24	8	No
Korea	25	37	−19	−11	3	No
Latvia	5	—	−59	—	32	No
Lithuania	1	—	−87	—	12	No
Luxembourg	11	—	−68	—	13	No
Mexico	43	17	−17	—	8	No
Netherlands	11	—	−50	—	34	Yes
New Zealand	12	8	−36	10	38	No
Norway	4	—	−54	−30	40	Yes
Poland	18	9	−9	—	24	No
Portugal	9	14	−57	—	25	No
Slovak Republic	16	14	−6	—	29	No
Slovenia	9	—	−29	—	25	No
Spain	16	—	−61	—	26	Yes
Sweden	4	—	−31	—	38	No
Switzerland	11	15	−48	—	25	No
Turkey	54	—	−14	—	18	No
United Kingdom	12	17	−31	−35	33	No
United States	14	18	−12	−18	26	No

Sources: OECD for statistics on gender quotas for women on boards of directors of large (listed) companies; European Commission and country-specific information sources.

Note: The gender employment gap is the difference in employment-population ratios of prime-age men and women. "—" = not available.

Blinder-Oaxaca Decomposition

- Run separate wage regressions for men and women:

$$w_m = \alpha_m + \beta_m X_m$$
$$w_f = \alpha_f + \beta_f X_f$$

- $\overline{w}_m - \overline{w}_f$ can be written as the sum of three parts:

$$\Delta w = (\alpha_m - \alpha_f) + (\beta_m - \beta_f)\overline{X}_f + \beta_m(\overline{X}_m - \overline{X}_f)$$

- Olive term is due to differences in productive characteristics
- Red term is due to different returns to those characteristics
- Blue term is due to simple gender difference
- The Blinder-Oaxaca decomposition attribute the sum of red and blue terms to gender wage discrimination

Concerns

- Differences in $\overline{X}$ may be due to pre-market discrimination
- Relevant productivity characteristics may not be captured in X

Blind Auditioning

- Goldin and Rouse (2000) study employment of female musicians in orchestras
- Many orchestras adopted blind auditioning in the 1970s and 1980s—candidates perform behind a screen that conceal their identity from the selection committee
- The practice is estimated to raise the percentage of women hired by orchestras from 27 percent to 35 percent

Audit Study

- Neumark, Bank and Van Nort (1996) hired research assistants to interview for waiter/waitress jobs in restaurants
- Matched pairs of male and female RAs present similar credentials and are trained to respond in similar ways in job interviews
- 8 out of 10 job offers in low-price restaurants were made to female candidates
- 11 out of 13 job offers in high-price restaurants were made to male candidates
- Pay in high-price restaurants is much better
- This is not a double-blind study

Emilys and Lakishas

- Bertrand and Mullainathan (2004) produce pairs of fictitious CVs and randomly assign predominantly black names ("Lakisha" and "Jamaal") or predominantly white names ("Emily" and "Greg") to these CVs
- No need to train auditors to behave "in the same way" and can avoid unconscious bias arising from the fact that the investigators know the purpose of the study
- Can only measure the initial response—callbacks
- Callback rate was 1/10 for white names
- Callback rate was 1/15 for black names
- Difference in callback rates is larger for CVs with higher qualifications

Theories of Discrimination

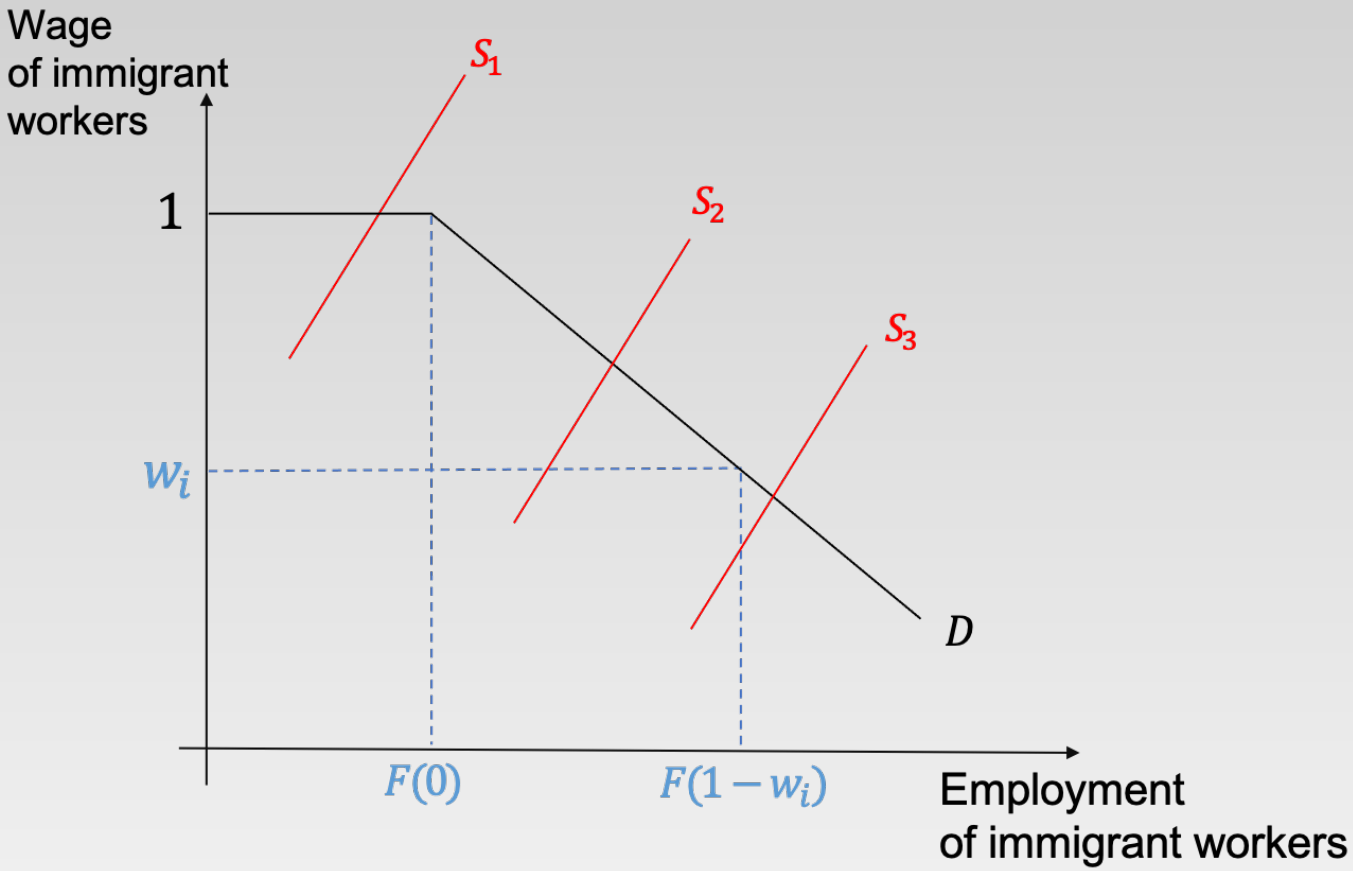
- Taste-based theories of discrimination
  - employers' prejudice
  - customers' prejudice
  - co-workers' prejudice
- Statistical discrimination

Employer prejudice

- Employer k attaches a disutility d_k to hiring or working with an employee from a group he doesn't like, say immigrants
- If wage of native workers is w_n and wage of immigrants is w_i, then employer k:
  - hires native workers if $w_n - w_i < d_k$
  - hires immigrant workers if $w_n - w_i > d_k$
- Distribution of discrimination coefficient is F (fraction of employers with $d_k \leq d$ is $F(d)$)
- Normalize native wages to $w_n = 1$
  - if $w_i = 1$, only employers with discrimination coefficient equal to 0 would want to hire immigrants. Demand curve is horizontal at $w_i = 1$ up to the point $F(0)$
  - if $w_i < 1$, employers with discrimination coefficient less than or equal to $1 - w_i$ are willing to hire immigrant workers
  - demand for immigrant workers is $F(1 - w_i)$

Implications

- Discrimination has no significant impact if it is not widespread (i.e., $F(0)$ is large relative to supply of minority workers)
- Pay gap in a region is larger when the share of minority worker in the region is larger



Discrimination and Profits

- Prejudiced employers make less profits than employers who are not prejudiced because their labor cost is higher
- The profit motive can be a constraint on discrimination
  - discrimination falls after takeovers
  - more discrimination in regulated or monopolistic industries
  - what about the public sector?
- But collectively, if prejudice is widespread, low demand for minority workers may depress minority wages and benefit employers as a group

Customer Prejudice

TABLE 9-2 **Relation between Customer Discrimination and Percentage of Newly Hired Workers Who Are Black**

Source: Harry J. Holzer and Keith R. Ihlanfeldt, "Customer Discrimination and Employment Outcomes for Minority Workers," *Quarterly Journal of Economics* 113 (August 1998): 846.

Type of Firm	More Than Half of Firm's Customers Are Black	More Than 75% of Firm's Customers Are White	Difference
Contact between customers and workers	58.0%	9.0%	49.0%
No contact between customers and workers	46.6	12.2	34.4
Difference-in-differences	—	—	**14.6**

Coworker Prejudice

- Workers in the majority group may resist taking orders or sharing responsibilities with minorities
- Employers who want to retain these workers may need to pay them compensating wage differentials
- Or refrain from hiring/promoting minorities to avoid upsetting majority workers

Statistical Discrimination

- There are two groups in society, H (majority) and U (minority). The productivity of a person j is P_j
- If productivity is perfectly observed, under competition we simply have $w_j = P_j$. Group membership has no bearing on wages
- Suppose the market doesn't directly observe productivity (imperfect information). Employers only observe:
  - a noisy signal ($T_j = P_j + e_j$) about productivity
  - the group ($i = H, U$) that worker j belongs to
- How do they form expectation about worker j's productivity?

Bayesian Updating

- Prior belief about group i workers: $P_j^i \sim N(\mu_i, \sigma_i^2)$
- Noise $e_j^i \sim N(0, \eta_i^2)$
- Posterior expectation about j's productivity is

$$\mathrm{E}[P_j^i \mid T_j, i] = (1 - \beta_i)\mu_i + \beta_i T_j$$

- where

$$\beta_i = \frac{\sigma_i^2}{\sigma_i^2 + \eta_i^2}$$

Wage Gap

- Wage gap between group H and group U is

$$\overline{w}_H - \overline{w}_U = [(1-\beta_H)\mu_H + \beta_H \overline{P}_H] - [(1-\beta_U)\mu_U + \beta_U \overline{P}_U]$$

- Even if the two groups have the same average productivity ($\overline{P}_H = \overline{P}_U$), a wage gap may still exist if employers have wrong beliefs about minorities (i.e., if $\mu_U < \mu_H$)
  - belief might be accurate in the past but are no longer valid
  - wrong belief may be due to prejudice
  - more contact between the two groups may help overcome mistaken beliefs

Group Averages

- Suppose beliefs are accurate $\mu_i = \overline{P}_i$, but $\overline{P}_H > \overline{P}_U$
- Two workers from different groups with the same test score $T_j^H = T_{j'}^U = T$ may be paid differently:

$$w_j^H = (1 - \beta_H)\overline{P}_H + \beta_H T$$
$$w_{j'}^U = (1 - \beta_U)\overline{P}_U + \beta_U T$$

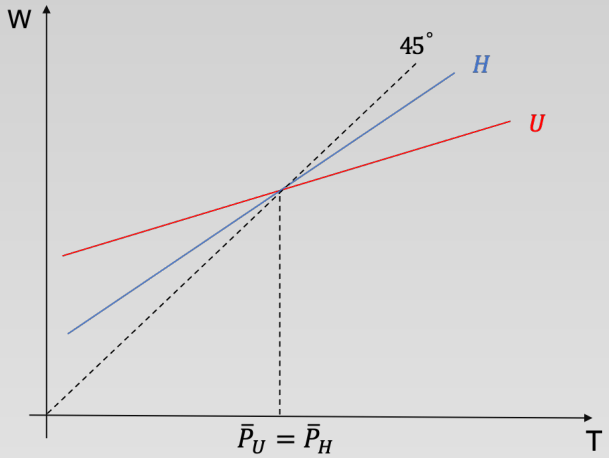
- These beliefs are rational but they violate anti-discrimination laws
- This model does not explain why $\overline{P}_H \neq \overline{P}_U$ to begin with

Lundberg and Startz (1983)

- Assume $\mu_H = \mu_U = \overline{P}_H = \overline{P}_U$ (will modify this assumption later)
- Assume $\sigma_H^2 = \sigma_U^2$
- Assume $\eta_H^2 < \eta_U^2$
  - cultural differences between the two groups may make signals from the minority group less easy to interpret (more noisy)
  - will try to make this a result rather than an assumption later

Slopes and Averages

- Assumptions imply $\beta_H = \sigma_H^2/(\sigma_H^2 + \eta_H^2)$ is larger than $\beta_U = \sigma_U^2/(\sigma_U^2 + \eta_U^2)$
- Slope (sensitivity) of wage with respect to test score is steeper for majority group



  - workers with identical productive characteristics (test scores) are paid differently
  - minority worker with high scores are being discriminated against, but minorities with low scores are favored!
  - no systematic difference in average wages: $\overline{w}_H = \overline{P}_H$ and $\overline{w}_U = \overline{P}_U$

Investment in Human Capital

- Productivity P_j is not entirely pre-determined; it depends on investments in human capital. Let

$$P_j^i = \alpha_j^i + \rho X_j^i$$

  - α_j^i is j's "innate ability"
  - distribution of innate ability is identical across the two groups—they have the same mean $\overline{\alpha}$ and the same variance σ_α^2
  - X_j^i is j's investment in human capital
  - cost of investment is $C_j(X) = cX^2/(2\delta_j)$, where $\delta_j \sim N(\overline{\delta}, \sigma_\delta^2)$

Optimal Investment

- Worker j maximizes

$$\mathrm{E}\Big[(1-\beta_i)\overline{P}_i + \beta_i(\alpha_j^i + \rho X_j^i + e_j^i)\Big] - c\frac{(X_j^i)^2}{2\delta_j}$$

- First-order condition is

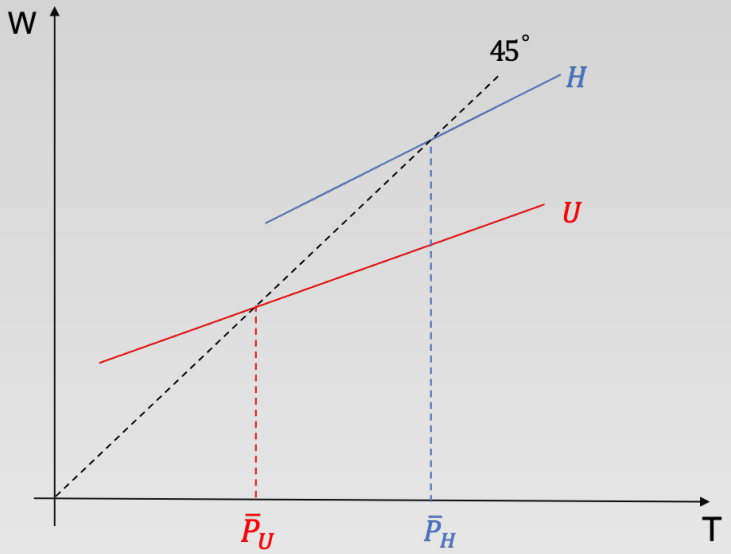
$$\beta_i \rho - \frac{cX^i}{\delta_j} = 0$$

- Higher β leads to higher marginal benefit of investment. H group invests more on average

$$X^H = (\beta_H \rho \overline{\delta})/c > X^U = (\beta_U \rho \overline{\delta})/c$$

Steeper and Higher Wage Profile

- Average productivity of H group is $\overline{\alpha} + \rho X^H > \overline{\alpha} + \rho X^U$
- So we have $\overline{P}_H > \overline{P}_U$ and hence $\overline{w}_H > \overline{w}_U$

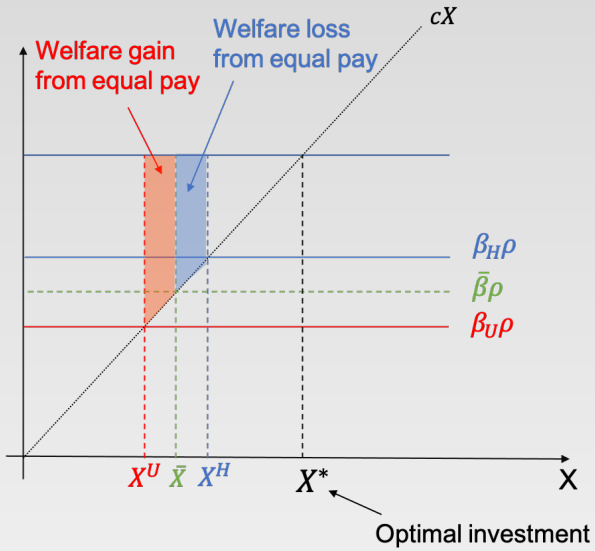


Underinvestment in Human Capital

- Social returns to human capital investment is ρ
- Private return is $\beta_i \rho$ for group i
- $\beta_i < 1$ implies there is underinvestment in human capital for both groups
- $\beta_U < \beta_H$ implies that the underinvestment problem is more severe for group U

Equal Pay

- Suppose the law requires employers to treat both groups equally, and pay workers according to $w_j = (1 - \overline{\beta})\overline{P} + \overline{\beta} T_j$, where $\overline{\beta} = (\beta_H + \beta_U)/2$
- X^H falls but X^U rises
- Group H is hurt while group U benefits
- But the gains exceed the losses because the underinvestment problem was more severe for the U group than for the H group



Signal-to-Noise Ratio

- σ_i^2/η_i^2 is the signal-to-noise ratio for group i
- Higher signal-to-noise ratio leads to higher β_i
- The earlier analysis assumes $\eta_H^2 < \eta_U^2$ to derive $\beta_H > \beta_U$
- Now, we assume $\eta_H^2 = \eta_U^2 = \eta^2$. Everything is identical between the two groups
- One equilibrium is that $\beta_H = \beta_U$ and all outcomes are the same for these two groups
- But there can be other equilibria (with $\beta_H \neq \beta_U$) in which the two groups are treated differently!

Variance of Productivity

- Recall that

$$P_j^i = \alpha_j^i + \rho X_j^i = \alpha_j^i + \rho \left(\frac{\beta_i \rho \delta_j}{c} \right)$$

- The variance of productivity for group i is

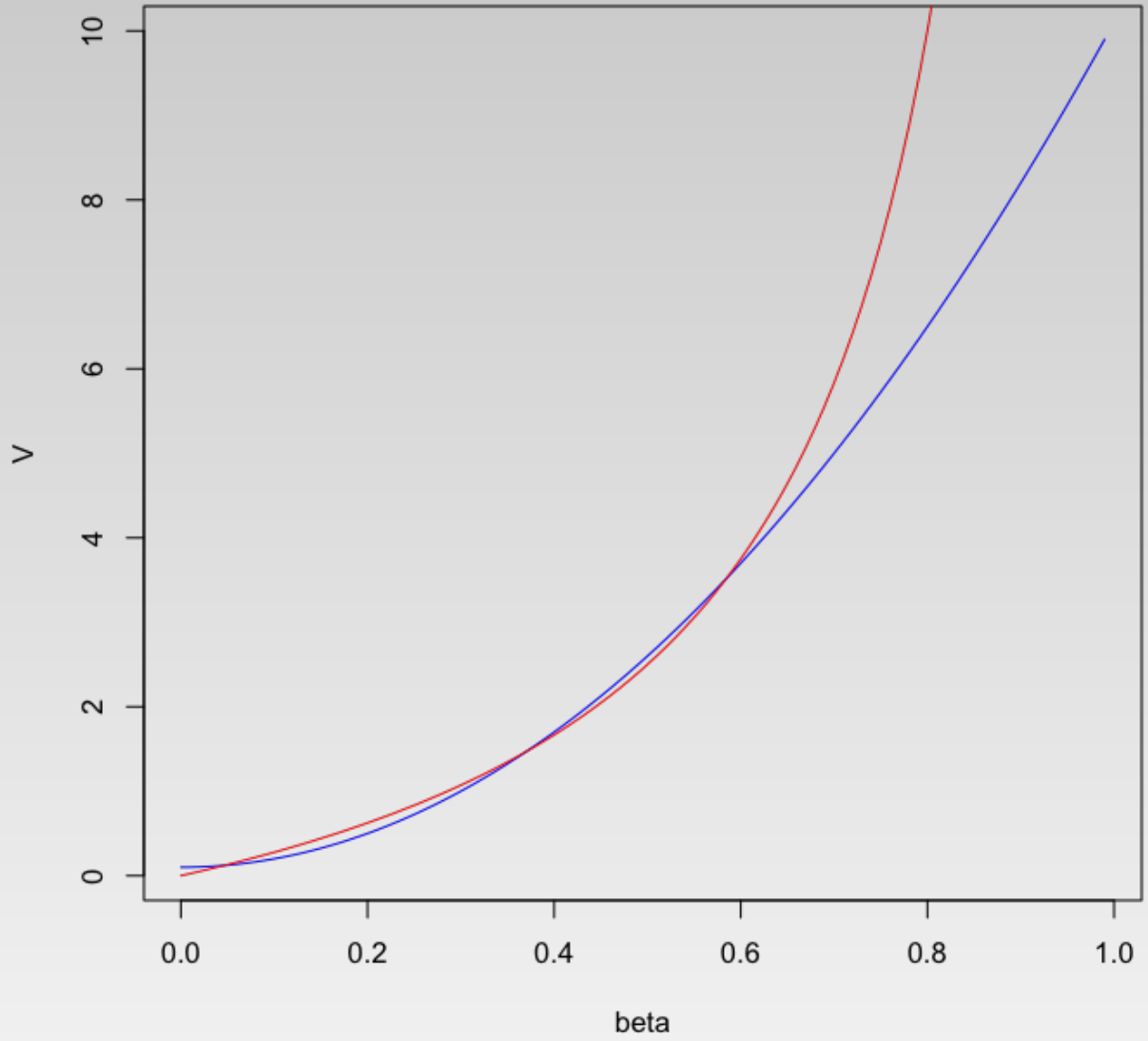
$$\sigma_i^2 = \sigma_\alpha^2 + \frac{\rho^4 \beta_i^2}{c^2} \sigma_\delta^2$$

- Also recall that

$$\beta_i = \frac{\sigma_i^2}{\sigma_i^2 + \eta^2}$$

- These two equations can be solved for the two unknowns (β_i and σ_i^2)

Equilibrium Conditions



Multiple Equilibria

- Blue line is first equation: higher β_i leads to higher variance in investment in human capital and hence higher variance in productivity σ_i^2
- Red line is second equation: higher variance in productivity σ_i^2 leads to greater signal-to-noise ratio and hence higher β_i
- There can be multiple intersections. If group H is at the higher intersection and group U is at the lower intersection, then β_H, σ_H^2 and $\overline{w}_H$ will all be higher for group H than for group U despite the fact that they are ex ante identical

Anti-discrimination Legislation

- Congress passed the Americans with Disabilities Act in 1990
- By requiring employers to provide “reasonable accommodation” to workers with disabilities, the Act increases the cost of hiring disabled workers
- The ADA also increases the cost of firing disabled workers because it makes it easier for these workers to sue. While increasing firing cost seems to be beneficial to these workers, one has to worry about long run consequences. Employers who anticipate higher firing costs are less likely to hire these workers because no one can guarantee that an initially good match will stay good forever. Also note that workers who are fired are a lot more likely to sue than workers who don’t get hired

Effects of ADA

- The equal pay provision of the ADA may have increased the wages of the disabled, creating involuntary unemployment off the disabled labor supply curve. The equal pay provision also interacts with firing costs and the costs of accommodation by preventing wages from falling to offset these costs, exacerbating the decline in employment of the disabled
- The accommodation costs and litigation costs could amount to at least US$35 per disabled worker per week, representing roughly a 6–10 percent increase in labor cost
- Acemoglu and Angrist (2001) find a substantial and statistically significant decline in weeks worked by disabled people after the ADA became effective in 1992

Lessons for Causal Inference

- Audit studies