

Principles of Economics

Chapter 19:

Earnings and Discrimination

2022/11/18

Earnings and Discrimination

Joseph Tao-yi Wang & Junrok Park

In This Chapter

- How do wages **compensate** for differences in job characteristics?
- Why do people with more **education** earn higher wages?
- Why are wages sometimes above their equilibrium values?
- Why is it difficult to measure **discrimination**?
- When might the market solve the problem of discrimination? When might it not?

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U.S. Median Weekly Earnings, Selected Occupations, 2018

Occupation	Both sexes	Men	Women	Gender gap
Chief executives	\$2,291	\$2,488	\$1,736	43.32%
Lawyers	1,947	2,202	1,762	24.97
Physicians & surgeons	2,001	2,513	1,677	49.85
Architects & engineers	1,484	1,538	1,301	18.22
Financial managers	1,466	1,784	1,262	41.36
Registered nurses	1,167	1,271	1,156	9.95
Postsecondary teachers	1,439	1,603	1,253	27.93
Counselors	941	1,004	913	9.97
Retail salespersons	657	764	543	40.70
Waiters/waitresses	496	551	478	15.27
All occupations	\$886	\$973	\$789	23.32%

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Review from the Previous Chapter

- In competitive markets
 - The wages workers earn equal the value of their marginal products (*VMPL*)
- There are many factors that affect productivity and wages...

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Compensating Differentials

- **Compensating Differential:**
 - Difference in wages that arises to offset nonmonetary characteristics of different jobs
 - Ex: Unpleasantness, Difficulty, Safety
- **Coal miners:** Paid more than other workers with similar education to compensate them for the **extra risks**.
- **Night shift workers:** Paid more than day shift to compensate for lifestyle disruption of **working at night**.
- Doctors vs. car mechanics

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Weekly Earnings of Full-Time Employed Persons

Educational Attainment	Median Weekly Earnings
Less than H.S.	\$ 588
H.S. diploma	751
Some college or Associate degree	848
Bachelor's degree only	1,236
Advanced degree	1,561

Age 25+ by Education, 2019:Q2

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Weekly Earnings of Full-Time Employed Persons		
Educational Attainment	Median Weekly Earnings	TAIWAN Median
P. S. and below	\$ 588	\$ 190
Mid. school (vocal.)		265
H.S. diploma	751	293
Some college or Associate degree	848	373
Bachelor's degree only	1,236	344
Advanced degree	1,561	573
Age 25+ by Education, 2019:Q2 (TAIWAN 2019)(US\$1=NT\$28.5)		
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Human Capital		
<ul style="list-style-type: none"> • Human Capital <ul style="list-style-type: none"> • Accumulation of investments in people, such as education and on-the-job training • Affects productivity, labor demand, wages • Firms, demanders of labor, are willing to pay more for highly educated workers (higher marginal products) • Workers, suppliers of labor, are willing to pay the cost of becoming educated only if there is a reward for doing so (higher wages) 		
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Ask The Experts

Inequality and Skills

- “One of the leading reasons for rising U.S. income inequality over the past three decades is that technological change has affected workers with some skill sets differently than others.”

• Do you Agree or Disagree?

• Do you think Economists Agree or Disagree?

Source: IGM Economic Experts Panel, January 24, 2012.

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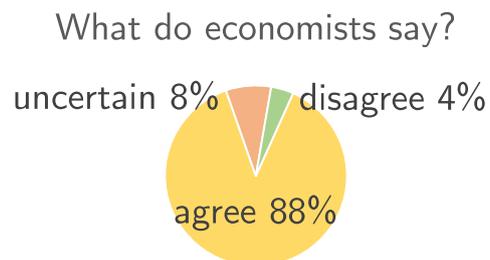
“One of the leading reasons for rising U.S. income inequality over the past three decades is that technological change has affected workers with some skill sets differently than others.”

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Ask The Experts

Inequality and Skills

- “One of the leading reasons for rising U.S. income inequality over the past three decades is that technological change has affected workers with some skill sets differently than others.”



Source: IGM Economic Experts Panel, January 24, 2012.

The Increasing Value of Skills

- Increase in International Trade:
 - Domestic demand for skilled labor rises
 - Domestic demand for unskilled labor falls
- Skill-biased Technological Change:
 - Raise the demand for skilled workers who can use the new machines
 - Reduce the demand for the unskilled workers whose jobs are replaced by the computers

The Increasing Value of Skills

The earnings gap between college-educated and non-college-educated workers has widened in recent decades.

	1977	2017
Men		
High school, no college	\$53,947	\$51,493
College graduates	\$77,469	\$90,725
Percent extra for college grads	+44%	+76%
Women		
High school, no college	\$31,740	\$36,927
College graduates	\$41,602	\$64,252
Percent extra for college grads	+31%	+74%

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Ability, Effort, and Chance

- Greater Natural Ability or Effort
 - Often command higher pay
 - These traits increase workers' marginal products, making them more valuable to the firm
- Wages are also affected by **Chance**
 - E.g., new discoveries no one could have predicted make some occupations obsolete, increase demand in others.
 - Textile workers' skill became useless after the invention of machines

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Ability, Effort, and Chance

- Ability, Effort, and Chance
 - Are difficult to measure
 - So it is hard to quantify their effects on wages
- They are probably important, though, since easily measurable characteristics (education, age, etc.) account for less than half of the variation in wages in our economy

The Benefits of Beauty

Research by Hamermesh and Biddle (AER 1994):

- People deemed more attractive than average earn 5% more than people of average looks
- Average-looking people earn 5–10% more than below-average looking people.
- Similar results for men and women

The Benefits of Beauty: Interpretations

1. Good looks - a type of innate ability
 - Determines productivity and wages
 - Attractive worker - more valuable to the firm
2. Reported beauty - indirect measure of other abilities
 - Dress, hairstyle, personal demeanor
 - Attributes that a person can control
 - Perhaps - more likely to be an intelligent person who succeeds at other tasks as well
3. Beauty premium: a type of discrimination

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The Benefits of Beauty

Mei-Hsuan Chen (2009): Among Taiwan female college graduates

1. Height/weight related to self-confidence
 - in college: Being higher and skinnier makes you more confident about yourself
2. Self-confidence (during college) increases initial salary by NT\$1,1xx, while height and weight matters!
 - 1cm increases it by NT\$5x; 1kg decreases it by NT\$5x
3. Consistent with reported beauty as “indirect measure of other abilities”

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Active Learning: Discussion Question

Suppose you were offered this choice:

- A. Spend 4 years studying at the world's best university, but must keep your attendance there a secret.
 - B. Get an official degree from the world's best university, but cannot actually study there.
- Which do you think would enhance your future earnings more?

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Which do you think would enhance your future earnings more?

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The Signaling Theory of Education

- Firms use education level to sort between high-ability and low-ability workers
 - The difficulty of earning a college degree demonstrates to prospective employers that college graduates are highly capable
 - Yet, the education itself has no impact on productivity or skills
- Policy implication
 - Increasing general educational attainment would not affect wages

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The Superstar Phenomenon

- Messi, Curry, Otani, Wu Bai, Mariah Carey (It's Christmas soon)
 - Great public appeal and astronomical incomes
- Superstars arise in markets where:
 - Every customer in the market wants the good supplied by the best producer
 - The good is produced with a **technology** that allows the best producer to supply every customer at low cost

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The Superstar Phenomenon

- Online platforms created a new type of superstar employees
 - Drivers, delivery personnel vs. data scientists
(at any prominent platforms, such as Amazon, Momo, PCHome, Coupang...)
- There are superstar companies as well
 - You want to use the best platform
- While the traditional superstars were exceptions from the whole economy, new superstars are not
 - Further reading: the Profit Paradox (Jan Eeckhout)

Above-Equilibrium Wages

1. Minimum-wage Laws
 - The minimum wage may exceed the equilibrium wage of the least-skilled and experienced workers
2. Market Power of Labor Unions
 - **Union:** worker association that bargains with employers over wages and working conditions
 - Higher wages; most union workers earn 10–20% more than similar nonunion workers
 - They behave like a monopolist in the labor market

Above-Equilibrium Wages

3. Theory of Efficiency Wages

- **Efficiency Wages:** Above-equilibrium wages paid by firms to increase worker productivity (Example: Costco 好市多)
- Firms may pay higher wages to reduce turnover, increase worker effort, or attract higher-quality job applicants.
- Netflix is known for its 'high responsibility and compensation' culture
- Effects of Above-equilibrium Wages:
 - Surplus of labor (unemployment)

Active Learning: Which Job Earns More?

In each case, identify which worker would earn more and use the concepts in this chapter to explain why.

- A. The best doctor on the planet or one of the best actors on the planet.
- B. A trucker who hauls produce or one who hauls hazardous waste.
- C. College graduate of NTU or an equally intelligent and capable graduate of NTUST (天大地大...).
- D. Someone who graduated from NTU with a 3.7 GPA or someone who graduated from the same university with a 2.4 GPA

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identify which worker would earn more and use the concepts in this chapter to explain why.

The best doctor on the planet or one of the best actors on the planet.

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A trucker who hauls produce or a trucker who hauls hazardous waste

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Active Learning: Answers A, B

- A. The best doctor on the planet or one of the best actors on the planet.
- **The Superstar Phenomenon:** The best actor can service many more customers than the best doctor can.
- B. A trucker who hauls produce or a trucker who hauls hazardous waste from nuclear power plants.
- **Compensating Differentials:** The hazardous waste hauler earns more to compensate for the higher risks.

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College graduate of NTU or an equally intelligent and capable graduate of NTUST

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identify which worker would earn more and use the concepts in this chapter to explain why.

Someone who graduated from NTU with a 3.7 GPA or someone who graduated from the same university with a 2.4 GPA

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Active Learning: Answers C, D

- C. College graduate of NTU or an equally intelligent and capable graduate of NTUST (天大地大...)
- The Signaling Theory of Education: Employers assume NTU graduates have more ability than others
- D. Someone who graduated from NTU with a 3.7 GPA, or one who graduated from the same university with a 2.4 GPA
- The Human Capital Theory of Education: A higher GPA reflects greater learning, which leads to higher productivity and wages.

The Economics of Discrimination

- Discrimination
 - Offering of different opportunities to similar individuals who differ only by
 - Race, ethnic group, sex, age, or other personal characteristics
- Another source of differences in wage

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Gender Discrimination of Taiwan

- Narrowing wage gap btw Taiwanese female vs. male workers.



Wage Gender Gap of **Taiwan**
(Average Disposable Income in NTD)

	Male	Female	Diff.
2019	\$ 627,848	\$ 468,597	34%
2013	575,000	435,552	32%
2007	580,712	430,339	35%
1994	503,473	320,960	57%
1976	78,680	40,775	93%

Source: 民國108/102/96/83/65年家庭收支調查

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Measuring Labor-Market Discrimination

- Median earnings, full-time **white males**:
 - Earn 23% more than white females.
 - Earn 35% more than Black or African American males.
 - Earn 23% less than Asian males
- Taken at face value: these differences look like evidence that employers discriminate.
- Many possible explanations for wage differences besides discrimination...

Differences in Wages

- Different groups of workers earn substantially different wages
 - Discrimination?
 - Human Capital
 - Quality and quantity of education
 - Job experience
 - Compensating Differentials (Kinds of work able/willing to do)
 - Working conditions

Educational Attainment

- Differences in Educational Attainment
 - 2017, men age 25 and older
 - 34% of the white population had a college degree
 - 24% of the black population
- Quality of Public Schools (expenditure, class size, etc.)
 - Historically: Public schools in predominantly black areas have been of lower quality than public schools in predominantly white areas

Human Capital

- Human capital acquired in the form of job experience
 - Women are more likely to interrupt their careers to raise children
 - Women have less on-the-job experience than men
 - Population aged 25 to 44
 - 75% of women are in the labor force
 - 90% of men

Compensating Differentials

- Compensating Differentials
 - Men and women do not always choose the same type of work
 - Women are more likely to be administrative assistants
 - Men are more likely to be truck drivers
 - Different working conditions

Is Emily More Employable Than Lakisha?

Marianne Bertrand & Sendhil Mullainathan (AER 2004)
answered >1,300 help-wanted ads run in Boston and Chicago:

- Sent 5,000 similar fake résumés
 - Half of the résumés had names that were common in the African American community
 - The other half had names that were more common among the white population
- Results: Applicants with white names received 50% more calls!
 - Discrimination occurred for all types of employers

What About Asian names?

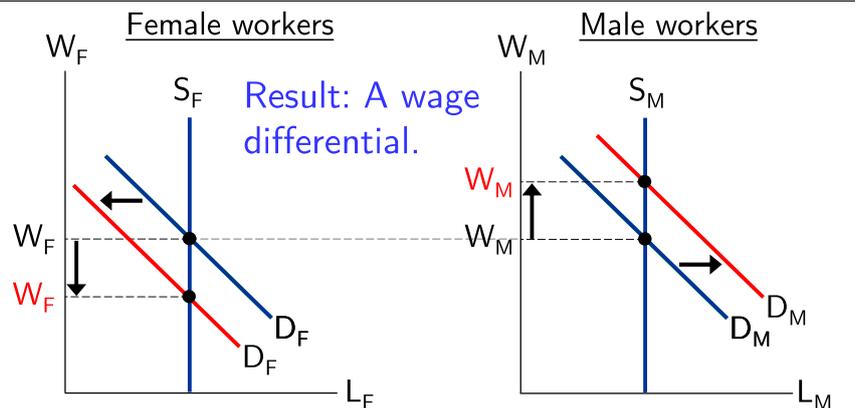
- Philip Oreopoulos (AEJ: Policy 2011): Canadian labor market
- Sent fake résumés with English, Indian, Pakistani, Chinese, and Greek names
 - Significant evidence of discrimination
 - English-sounding names received 39% more callbacks
 - Across the four ethnic groups
 - Even if the fictional applicant had an English-sounding first name and a Chinese last name

Discrimination by Employers

- If one group in society receives a lower wage than another group
 - Even after controlling for human capital and job characteristics
 - Who is to blame for this differential?
 - Employers (for discriminatory wage differences)?
- Competitive market economies have
 - Natural antidote to employer discrimination: Profit Motive

Example: Discrimination by Employers

Suppose some firms discriminate against female workers. They will hire fewer females, more males.



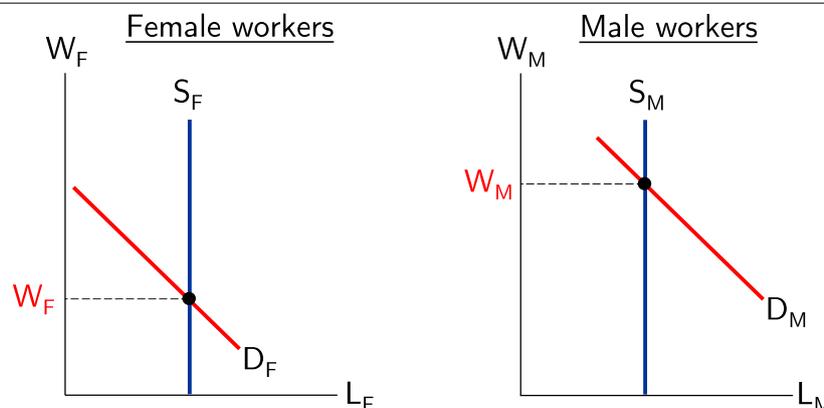
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Example: Discrimination by Employers

Non-discriminating firms hire females at a lower wage, gaining a cost advantage and economic profits, so new non-discriminating firms will enter.



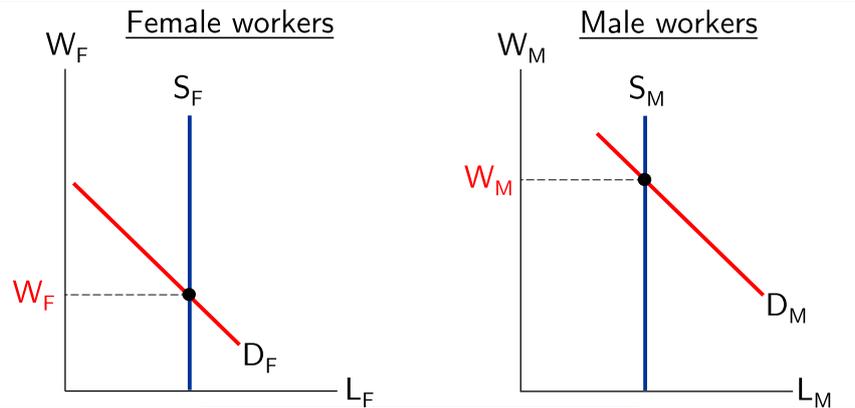
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Example: Discrimination by Employers

The discriminating firms will begin to lose money and be driven out of the market.



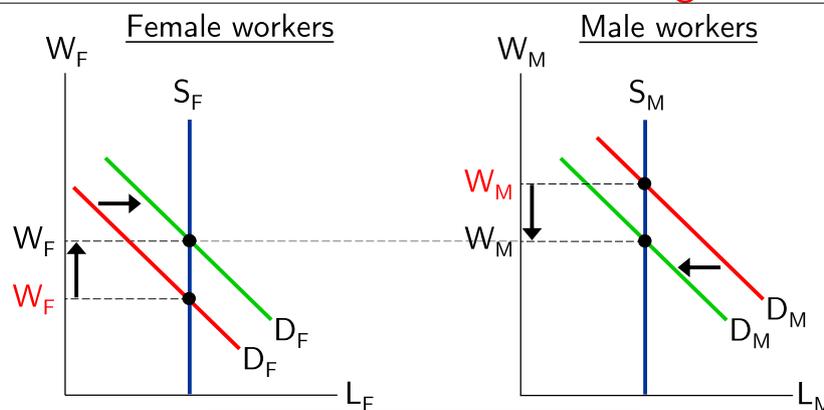
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Example: Discrimination by Employers

Result: Demand for female workers increases,
demand for male workers falls until wages are equalized.



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Discrimination by Consumers

- Discrimination by consumers may result in discriminatory wage differentials.
 - Suppose restaurants care only about maximizing profits, but customers prefer being served by workers with green eyes
 - Then restaurants have an incentive to hire workers with green eyes, even if non-green-eyed workers are willing to work for lower wages

Discrimination by Governments

- Some government policies mandate discriminatory practices.
 - Apartheid in South Africa before 1990s
 - Early 20th century U.S. laws requiring segregation in buses and streetcars
- Such policies prevent the market from correcting discriminatory wage differentials

Example: Uber Drivers

- Uber determines driver compensation by a publicly available formula using time, distance and location
- Cook et al. (2020 ReStud) find that male earn roughly **7% more per hour** than female on average since male tend to
 - Drive in more lucrative (i.e., dangerous) locations
 - Be more experienced in ridesharing
 - Drive faster
- Women's relatively high opportunity cost gender-based differences in preferences and constraints can sustain the gap in compensating differentials and human capital, and thus the wage gap

Wage Differentials

- In competitive markets
 - Workers are paid a wage that equals the value of their marginal products
 - Many factors affect the value of marginal products and equilibrium wages
- The **profit motive can correct**
 - Discrimination by employers
 - But not discrimination by customers or discriminatory policies of governments

Statistical Discrimination

- **Statistical Discrimination**
 - Arises because an irrelevant but observable personal characteristic is correlated with a relevant but unobservable attribute
- **Assumption:**
 - Employers have imperfect information about possible employees
 - Employers may rely on the observable characteristic when making hiring decisions

Example: Punctuality

Employers care about punctuality.

- It is hard for employers to know whether a job applicant is likely to be punctual once hired.
- Employers know that 20% of workers with blue eyes are chronically late. (only 3% of workers with brown eyes)
 - Explain how this can lead to statistical discrimination.

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Employers care about punctuality.
It is hard for employers to know whether a job applicant is likely to be punctual once hired.
Employers know that 20% of workers with blue eyes are chronically late. (only 3% of workers with brown eyes)
Explain how this

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Think-Pair-Share

To Eliminate Wage Differentials Due to Discrimination,

...the government creates a panel to decide what jobs should pay so people of similar skills and education earn the same \$\$.

- A. Suppose an administrative assistant and a truck driver are judged to require the same level of education and skills, yet an administrative assistant earns \$30,000 while a truck driver earns \$40,000.

What would happen to the quantities supplied and demanded in the market for administrative assistants and truck drivers if the wage for these professions were set by law at \$35,000?

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Suppose an admin assistant and a truck driver require the same level of education, yet an admin assistant earns \$30,000 while a driver earns \$40,000.

What would happen to the quantities supplied and demanded if the wages were fixed at \$35,000 by law?

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Think-Pair-Share

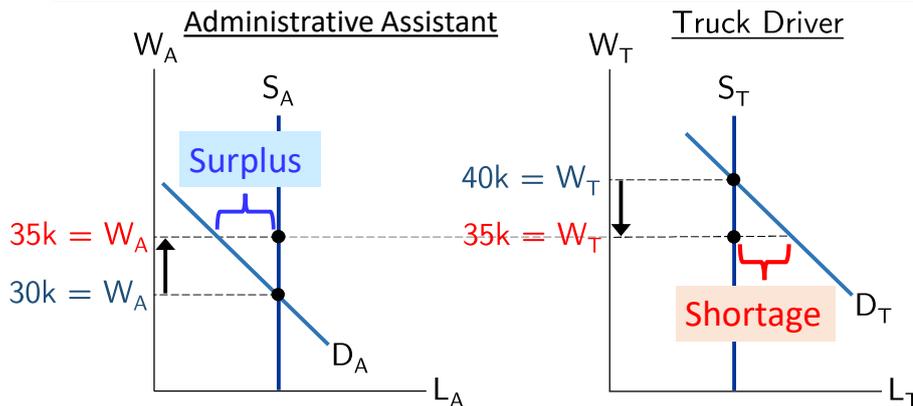
To Eliminate Wage Differentials Due to Discrimination,

- B. What would happen to the level of effort and natural ability of the workers available in each market in question A? What would happen to the quality of work generated in each market?
- C. Suppose it is true that the skills and education required to do each job in question A are, in fact, nearly identical. What explanation would an economist likely propose to explain why the equilibrium wage differs by \$10,000 across these markets?

Think-Pair-Share

Administrative Assistant vs. Truck Driver

Surplus of administrative assistants/**shortage of truck drivers** if the wage for these professions were set by law at \$35,000!



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What would happen to the level of effort and natural ability of the workers available in each market in question A? What would happen to the quality of work generated in each market?

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Suppose it is true that the skills and education required to do each job in question A are, in fact, nearly identical. What explanation would an economist likely propose to explain why the equilibrium wage differs by \$10,000 across these markets?

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Chapter In A Nutshell

- Reasons for wage differentials:
 - **Compensating differentials:** workers in hard, unpleasant jobs are paid more than workers in easy, pleasant jobs.
 - Workers with more **human capital** (education, experience) are paid more than workers with less human capital.
 - Natural **ability, effort, and chance** – not easy to measure.
- **Above-equilibrium wages** are due to: minimum-wage laws, unions, and efficiency wages.

Chapter In A Nutshell

- **Signaling theory**: more educated workers earn higher wages because workers with high natural ability use education as a way to signal their high ability to employers.
 - Increasing the educational attainment of all workers would not raise the overall level of wages.
- Some differences in earnings are attributable to **discrimination** based on race, sex, or other factors.
 - Difficult to measure

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Chapter In A Nutshell

- Competitive markets tend to limit impact of discrimination on wages: **nondiscriminatory firms will be more profitable!**
- Discrimination persists in competitive markets if:
 - **Customers**: willing to pay more to discriminatory firms
 - **Government** passes laws requiring firms to discriminate.
- **Statistical discrimination**: if employers have imperfect information about employee characteristics, they may discriminate against members of a group that has undesirable characteristics on average.

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Chapter 19: Earnings and Discrimination

- Benchmark (Ch.18): $W=VMPL$
- Other reasons for wage differentials:
 - Job Characteristics: Difficulty, Risk, Superstar
 - Personal Traits: Ability, Effort, Chance, etc.
 - Education: Human Capital vs. Signaling
- Discrimination (and possible cures)
- Homework: Mankiw, Ch.19, Problem 1, 6-8

Challenge Questions (Past Finals)

- 2007 - Part 2
- 2008 - Part A
- 2012 - Part II, A, B6-B7
- 2014 - Essay C1-C2
- 2016 - Essay D
- 2018 - Essay A1-A5
- 2019 - Essay C

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Any questions?

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Ch.19:

The End

Principles of Economics

Classroom Experiment 12:

Screening and Signaling

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Screening

- SKT Offers 2 Cell Phone Plans:
 - Plan A: \$1 per minute
 - Plan B: \$168 monthly for 300min, then \$1.5/min
- Based on Last digit of student ID# (or card drawn), you will use:
 - ♠13: Use 0-100min/mo
 - ♥24: Use 200-300min/mo
 - ♦680: Use 400-500min/mo
 - ♣579: Use 600-700min/mo
- Which plan is cheaper for you?

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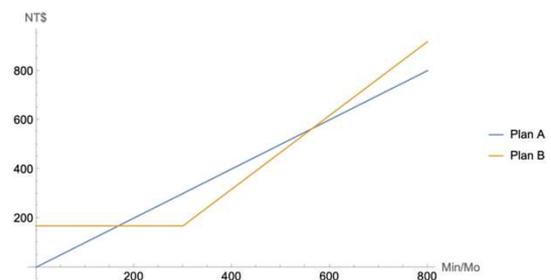
Plan A: \$1 per minute
Plan B: \$168 monthly for 300min, then \$1.5/min

Which plan is cheaper for you?

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Screening

- SKT Offers 2 Cell Phone Plans:
 - Plan A: \$1 per minute
 - Plan B: \$168 monthly for 300min, then \$1.5/min
- Plan A is cheaper if you use <168 or >564 minutes
- Plan B is cheaper if you use between 168 and 564 minutes



Applications of Screening

- Screening Devices designed to **Differentiate**
 - Let some choose Plan A, others **Plan B**
- Ex: **Marketing Campaigns** Target Specific Groups
 - BOGO, 2nd pair 50% off, 2nd bottle 41% off...
- Government uses progressive income taxation
 - The marginal tax rate goes up as you earn more
- Civil service exams in Taiwan
 - It has three tiers: senior, junior and elementary

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Signaling

1. Expected Salary if your kid graduate from:
 - ♡24♦680: National iDaiwan University: 35k/mo
 - ♠13♣579: Private Salty Chicken University: 22k/mo
2. If your kid go to graduate school at NiDU:
 - Expected salary 40k/mo, but need to repay student loans @ 5k/mo
3. Would you advise your kid to apply for NiDU graduate school? Why?



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**Would you advise
your son to apply for NiDU
graduate school?**

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What made you advice in that way?

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Applications of Signaling

- Higher-quality individuals invest resources that are too costly for low-quality others
- Luxurious buildings of financial companies
 - Only profitable companies can afford them
- Doctors/lawyers mentioning that they are from NTU
 - We usually don't know who's a good one
- When a startup conducts an IPO, the founder keeps more share
 - If the founder is not confident?