

N. GREGORY MANKIW

PRINCIPLES OF  
**ECONOMICS**  
Eight Edition



CHAPTER  
**19** **Earnings and Discrimination**

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Look for the answers to these questions:

- 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, 2015

Occupation	Both sexes	Men	Women	Gender gap
Chief executives	\$2,041	\$2,251	\$1,836	22.60%
Lawyers	1886	1914	1717	11.47%
Physicians & surgeons	1824	1915	1533	24.92%
Architects & engineers	1424	1452	1257	15.51%
Management	1351	1486	1139	30.47%
Registered nurses	1116	1222	1089	12.21%
Postsecondary teachers	1258	1405	1144	22.81%
Counselors	904	908	902	0.67%
Retail salespersons	590	694	494	40.49%
Waiters/waitresses	451	501	411	21.90%
<b>All occupations</b>	<b>\$809</b>	<b>\$895</b>	<b>\$726</b>	<b>23.28%</b>

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T.W. Average Monthly Earnings, Selected Occupations, 2017/9

Occupation	# of M	# of F	Salary (M)	Salary (F)	Gender Gap
銀行業	60,065	88,744	\$106,376	\$92,882	14.5%
電子零組件製造業	292,967	309,526	64,036	45,734	40.0%
電腦電子產品光學製品製造	113,537	97,013	71,505	41,952	70.4%
電力供應業	21,849	3,293	75,814	65,929	15.0%
金融及保險業	147,684	234,962	84,503	77,654	8.8%
專業科學及技術服務業	136,075	124,013	61,364	49,453	24.1%
醫療保健服務業	71,146	286,977	96,041	52,665	82.4%
航空運輸業	10,543	13,603	107,644	55,957	92.4%
法律服務業	3,067	7,270	55,538	47,154	17.8%
會計服務業	8,996	15,181	62,379	47,397	31.6%
廣告業及市場研究業	15,536	27,926	48,843	50,122	-2.6%
保全及私家偵探服務業	81,161	12,884	32,027	38,144	-16.0%
美髮及美容美體業	1,468	26,215	36,771	26,760	37.4%
營造業	386,053	76,328	42,637	31,506	35.3%

T.W. Average Monthly Earnings, Selected Occupations, 2017/9

Occupation	# of Men	# of Women	Men Salary	Women Salary
電力供應業	21,849	3,293	\$75,814	\$65,929
氣體燃料供應業	4,132	1,300	64,414	50,950
用水供應業	4,284	1,784	76,576	77,397
鐵路大眾捷運運輸業	20,273	5,368	53,895	45,291
公共汽車客運業	20,607	2,567	47,950	31,925
其他汽車客運業	8,905	2,514	27,022	24,510
汽車貨運業	59,657	17,275	36,210	31,376
航空運輸業	10,543	13,603	107,644	55,957
郵政業	17,798	8,529	53,333	50,991
快遞服務業	7,645	4,401	55,496	53,803

T.W. Average Monthly Earnings, Selected Occupations, 2017/9

Occupation	# of Men	# of Women	Men Salary	Women Salary
銀行業	60,065	88,744	\$106,376	\$92,882
人身保險業	36,971	77,243	55,944	67,452
財產保險業	8,276	8,231	56,025	44,021
其他保險退休基金輔助業	208	265	95,231	77,001
證券期貨及其他金融業	20,383	29,678	90,917	75,755
不動產開發業	24,104	20,808	54,123	48,787
不動產經營相關服務業	32,145	39,324	29,405	37,214
企業總管理機構及管顧業	40,425	43,744	57,946	52,680
專門設計服務業	21,180	3,729	68,441	53,430

行政院主計總處受僱員工薪資調查統計 2017/09

### Gender Wage Gap in Taiwan

資料來源：勞動部統計處

職業類別	國中以下		高中/高職		專科		大學		碩士以上	
	男	女	男	女	男	女	男	女	男	女
工業及服務業	275	583	549	531	561	463				
工業部門	324	600	565	561	514					
礦業及土石採取業	1345	1428	2063	649	104					
製造業	298	523	509	511	533					
電力及燃氣供應業	144	1054	618	254	301					
供水供應及污廢處理業	140	543	871	950	0					
營造業	472	1109	1004	1242	485					
服務業部門	237	571	544	505	387					
批發及零售業	81	557	544	508	432					
運輸及倉儲業	232	1191	1234	793	299					
住宿及餐飲業	288	344	255	138	0					
資訊及通訊傳播業	103	492	216	304	486					
金融及保險業	0	269	131	87	307					
不動產業	643	-5	534	799	-162					
醫療、科學及技術服務業	645	767	571	476	829					
支援服務業	443	246	485	551	467					
教育服務業	0	486	913	396	0					
醫療保健服務業	207	201	369	773	247					
藝術、娛樂及休閒服務業	84	219	178	375	0					
其他服務業	290	950	1112	848	643					

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### Introduction

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

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### Compensating Differentials

- Compensating differential:
  - Difference in wages that arises to offset the nonmonetary characteristics of different jobs (unpleasantness, difficulty, safety)
    - Coal miners and fire fighters are paid more than other workers with similar education to compensate them for the extra risks.
    - Night shift workers are paid more than day shift to compensate for the lifestyle disruption of working at night.

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### Ability, Effort, and Chance

- Greater ability or effort
  - Often command higher pay
  - These traits increase workers' marginal products
    - Make 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.

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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

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### The Benefits of Beauty

**Research by Hamermesh and Biddle:**

- 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.

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**CASE STUDY** The benefits of beauty

What explains these differences in wages?

- **Good looks - a type of innate ability**
  - Determines productivity and wages
  - Attractive worker - more valuable to the firm
    - Acting, sales, and waiting on tables
    - Firm's willingness to pay more to attractive workers reflects its customers' preferences

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**CASE STUDY** The benefits of beauty

What explains these differences in wages?

- **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
- **Beauty premium - type of discrimination**

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**CASE STUDY** The benefits of beauty

For Taiwanese female college graduates, Mei-Hsuan Chen (2009) shows that:

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 increases it by NT\$5x/cm and
  - weight decreases it by NT\$5x/kg
3. Consistent with **reported beauty** as **"indirect measure of other abilities"**

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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."*

What do economists say?

Response	Percentage
Agree	88%
Uncertain	8%
Disagree	4%

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**The Superstar Phenomenon**

- **Superstars in their field (F4/Chih-Ling Lin)**
  - 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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**Weekly Earnings of Full-Time Employed Persons Age 25+ by Education, 2017:Q3**

Educational attainment	Median weekly earnings
Less than H.S.	\$ 522
H.S. diploma	714
Some college or Associate degree	801
Bachelor's degree only	1,164
Advanced degree	1,470

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### Weekly Earnings of Full-Time Employed Persons Age 25+ by Education, 2017:Q3 (TAIWAN 2016)

Educational attainment	Median weekly earnings	TAIWAN median (US\$1=NT\$30)
P. S. and below	\$ 522	\$ 174
Mid. school (vocal.)		248
H.S. diploma	714	275
Associate/Some college	801	355
Bachelor's degree only	1,164	321
Advanced degree	1,470	515

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## Human Capital

- Human capital
  - 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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### The Increasing Value of Skills

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

Percentage difference in annual earnings for college graduates vs. high school diploma		
	1974	2014
Men	42%	81%
Women	35%	71%

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### The Increasing Value of Skills

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

Percentage difference in annual earnings for advanced degrees in Taiwan (2017)		
	Advanced	Bachelor
vs. High School	87%	17%
vs. Junior High	108%	29%

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**CASE STUDY**

### 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; changes in technology
  - 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

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### Active Learning 1 Discussion question

Suppose you were offered this choice:

- Spend 4 years studying at the world's best university, but must keep your attendance there a secret.
- 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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## Signaling (認證標籤)

1. A Set of Rules
  - ▶ Credentialism on the job market (and society)
2. Individuals Optimize
  - ▶ Which choice is better for my job market?
3. You React to Others Optimizing
  - ▶ Would salary be the same if everyone has a MA?
4. What Should Aggregate Data Look Like?
  - ▶ Pooling equilibrium says all should get a MA, though NiDU undergrads (♥◇) are indifferent

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## Signaling (認證標籤)

5. Does Empirical Data Match the Theory?
  - ▶ How many ♠♣(♥◇) really applied grad school?
6. Can Individual Differences be Explained?
  - ▶ If you are ♥◇, what were you thinking?
7. How Can the Institution (Rules) Improve?
  - ▶ What would you do as an employer?
  - ▶ As the Minister of Education?
8. Where Did this Institution Come From?
  - ▶ The Imperial Examination System (科舉制度)?

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## Applications of Signaling (認證標籤的應用)

- ▶ Signals Let You **Stand Out** (鶴立雞群)
  - ▶ Convince others you (your products) are better
- ▶ Examples:
  - ▶ Consumers Demand **Certificate of Origin**
    - ▶ Credentials, Recommendation Letters, MIT, ISO
  - ▶ Demonstrate Qualification in **Job Interviews**
    - ▶ Hire me, because...
    - ▶ Should I go for MBA immediately after college?

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## What Course Are You Taking?

- ▶ Your GPA serves two purposes:
  - ▶ Signal you are a smart and responsible student
  - ▶ Reflect the knowledge and abilities you have accumulated in college
- ▶ But what does **sweet and cheap GE** indicate?
  - ▶ What if I get a **C** in a tough course? Isn't that worse than taking easy sweet and cheap ones?
  - ▶ Next year, should you take the **road to heaven** (天堂路線) or the **deadly triangle** (必死鐵三角)?
    - ▶ (cf. NTUCourse on ptt)

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## Some Personal Recommendations

- ▶ In your 2nd year, take:
  - ▶ 古慧雯's Intermediate Micro & 駱明慶's Econometrics
- ▶ In your 3rd and 4th year, take:
  - ▶ 吳聰敏's 市場與台灣經濟發展 (Capstone Course on "Economist", Presentation and Writing)
  - ▶ 馮勃翰's 賽局理論與策略思考 Game Theory & Strategic Thinking (Capstone Course on Business Strategy)
  - ▶ English Composition (2 yr) or other languages
  - ▶ Apply for BESAP, SAPFS (人社學術人才跨國培育計畫)
  - ▶ Thinking about Graduate School?
    - ▶ Try out 1-2 graduate Micro/Macro/Econometric Theory or Master-level electives (駱明慶, 陳虹如, 李怡庭, ...)

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## Some Personal Recommendations

- ▶ Find your interest by taking electives broadly
  - ▶ Try **Summer** interns (industry) or RAs (academics)
- ▶ Then focus on **one** field to sharpen your skills
  - ▶ Use tough core courses required by other majors to establish your **secret weapon** (吃飯的傢伙)
- ▶ Develop **General Skills** as well:
  - ▶ **Logical Reasoning** by taking English Composition II (英文作文二) or Advanced Calculus (分析導論)
  - ▶ **Communication** (writing and oral presentation)
  - ▶ **Programming Skills** (C++/Python/Matlab/R, ...)

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## Some Personal Recommendations

- ▶ Interested in micro-economics?
  - ▶ Take **Calculus 4: With Applications to Economics**
  - ▶ Master **Intermediate Micro** and take **Micro Theory I**
- ▶ Like the experiments I run? Signup for TASSEL
  - ▶ Take my class in **Experimental Economics**
  - ▶ Start to do research with me now!
- ▶ If you want to apply for graduate school in Econ:
  - ▶ Take **Advanced Calculus (2<sup>nd</sup> yr)**, **Linear Algebra (1<sup>st</sup> yr)**; then **Advanced Statistical Inference (grad.)@NTU Math**
  - ▶ Take 2 years of **English Composition (I+II)@NTU FLLD**
  - ▶ Start to do research now!

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## 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

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## 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.
- **Effects of above-equilibrium wages**
  - Surplus of labor (unemployment)

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### Active Learning 2

### Explaining wage differentials

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

- A. The world's best physical therapist (who?) or the world's best writer (You Know Who!!)
- B. A trucker who hauls produce or a trucker who hauls hazardous waste
- C. A graduate of NTU (台大) or an equally intelligent & capable graduate of NTUST (天大地大...)
- D. Someone who graduated from NTU (台大) with a 3.7 GPA or someone who graduated from the same university with a 2.4 GPA

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### Active Learning 2

### Answers

- A. The best physical therapist on the planet (who?) or the best writer on the planet (You Know Who!!)
  - The superstar phenomenon:  
The best writer can service many more customers than the best physical therapist.
- 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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### Active Learning 2

### Answers

- C. A graduate of NTU (台大) or an equally intelligent & capable graduate of NTUST (天大地大...)
  - The signaling theory of education:  
Employers assume the NTU graduate has more ability than the NTUST graduate
- D. Someone who graduated from NTU (台大) with a 3.7 GPA, or someone 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.

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## Economics of Discrimination

- **Discrimination**
  - Offering of different opportunities to similar individuals who differ only by
    - Race, ethnic group, sex, age, or other personal characteristics

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## Gender Discrimination of Taiwan

- 什麼都漲，就是薪水不漲？ More true from men!
  - Narrowing wage gap btw Taiwanese female vs. male workers.



Wage Gender Gap of Taiwan (Average Disposable Income in NTD)			
	Male	Female	Diff.
2017	\$ 594,336	\$451,563	31.6%
2013	575,000	435,552	32%
2007	580,712	430,339	35%
1994	503,473	320,960	57%
1976	78,680	40,775	93%

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Source: 民國 106/102/96/83/65 年家庭收支調查



## Measuring Labor-Market Discrimination

- **Median earnings, full-time white males:**
  - Earn 22% more than white females.
  - Earn 28% more than black males.
- **Taken at face value**
  - These differences look like evidence that employers discriminate.
- **Many possible explanations for wage differences besides discrimination...**

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## Economics of Discrimination

- **Different groups of workers earn substantially different wages**
  - Discrimination?
    - Human capital
      - Quality and quantity of education
      - Job experience
    - Kinds of work able & willing to do
    - Compensating differentials
      - Working conditions

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## Economics of Discrimination

- **Differences in educational attainment**
  - 2014, men age 25 and older
    - 32% of the white population had college degree
    - 20% of the black population
  - 2014, women age 25 and older
    - 32% of the white population had college degree
    - 24% of the black population

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## Economics of Discrimination

- **Quality of public schools**
  - As measured by: expenditure, class size, and so on
  - Historically: public schools in predominantly black areas have been of lower quality than public schools in predominantly white areas
    - There may well be discrimination in access to education, but this problem occurs long before workers enter the labor force.

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## Economics of Discrimination

- 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

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## Economics of Discrimination

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

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### CASE STUDY Is Emily more employable than Lakisha?

- Economists Marianne Bertrand & Sendhil Mullainathan (AER 2004)
  - Answered more than 1,300 help-wanted ads run in Boston & Chicago newspapers
  - Send in nearly 5,000 fake résumés - similar
    - Half of the résumés had names that were common in the African American community
      - Lakisha Washington or Jamal Jones
    - The other half had names that were more common among the white population
      - Emily Walsh or Greg Baker

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### CASE STUDY Is Emily more employable than Lakisha?

- Results
  - Job applicants with white names
    - Received about 50% more calls
  - Discrimination occurred for all types of employers
  - Conclusion
    - “Racial discrimination is still a prominent feature of the labor market”
- What about Asian names?

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## 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 - discriminatory wage differences?
- Competitive market economies
  - Natural antidote to employer discrimination: profit motive

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## 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 firms care only about maximizing profits, but customers prefer being served by whites
  - Then firms have an incentive to hire white workers, even if non-whites are willing to work for lower wages

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## Discrimination by Governments

- Some government policies mandate discriminatory practices.
  - Apartheid in South Africa before 1994
  - Early 20th century U.S. laws requiring segregation in buses and streetcars
- Such policies prevent the market from correcting discriminatory wage differentials

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## Conclusion

- 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

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## Summary

- Workers earn different wages for many reasons:
  - Wage differentials play a role compensating workers for job attributes
  - Workers in hard, unpleasant jobs are paid more than workers in easy, pleasant jobs.
  - Workers with more human capital are paid more than workers with less human capital
  - Years of education, experience, and job characteristics
- The unexplained variation in earnings is largely attributable to natural ability, effort, and chance.

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## Summary

- Signaling theory
  - More educated workers earn higher wages not because education raises productivity but because workers with high natural ability use education as a way to signal their high ability to employers
  - So increasing the educational attainment of all workers would not raise the overall level of wages
- Three explanations of above-equilibrium wages
  - Minimum-wage laws, unions, efficiency wages

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## Summary

- Some differences in earnings are attributable to discrimination based on race, sex, or other factors.
- Competitive markets tend to limit the impact of discrimination on wages
  - Nondiscriminatory firms will be more profitable than discriminatory firms.
- Discrimination persists in competitive markets
  - If customers are willing to pay more to discriminatory firms or if the government passes laws requiring firms to discriminate

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## Chapter 19: Earnings & 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

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Earnings and Discrimination

Joseph Tao-yi Wang

## Chapter 19: Earnings & Discrimination

- ▶ Challenge Questions (Past Finals)
  - ▶ 2007 - Part 2
  - ▶ 2008 - Part A
  - ▶ 2012 - Essay C
  - ▶ 2014 - Essay C1-2
  - ▶ 2016 - Essay D
  - ▶ 2018 - Essay A1-5

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## 一對一最後通牒談判 (Ultimatum Game)

- ▶ Form groups of 3. Two group are paired
  - ▶ 三人一組，各組兩兩配對。配對的兩組有十張彩券
- ▶ Each pair has 10 tokens: one group is the Proposer, the other the Respondent.
  - ▶ 一組為面試官，負責提議如何分配十張彩券
- ▶ Proposers decide amount to give Respondents
  - ▶ 可能的提議有10-0, 9-1, 8-2, 7-3, 6-4, 5-5,...
- ▶ Respondents can either accept the split, or reject so that both get nothing
  - ▶ 另一組為應徵者只能回覆接受與否：如果接受，則按照該提議分配/如果不接受，則兩人都得到零張彩券

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