

N. GREGORY MANKIW NINTH EDITION

PRINCIPLES OF ECONOMICS

CHAPTER 19

Earnings and Discrimination

Interactive PowerPoint Slides by:
V. Andreea Chirilescu
Eastern Illinois University

Modified by Joseph Tao-yi Wang

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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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T.W. Average Monthly Earnings, Selected Occupations, 2020/9

Occupation	# of M	# of F	Salary (M)	Salary (F)	Gender Gap
銀行業	61,395	92,799	\$87,743	\$80,433	8.33%
電子零組件製造業	320,820	308,619	72,605	50,820	30.00%
電腦電子產品光學製品製造	122,999	105,845	111,329	65,391	41.26%
電力供應業	23,306	4,097	76,155	70,338	7.64%
金融及保險業	152,624	243,360	78,147	80,770	-3.36%
專業科學及技術服務業	149,339	128,637	65,317	50,405	22.83%
醫療保健業	81,661	315,830	99,494	57,540	42.17%
航空運輸業	10,040	12,816	115,937	52,910	54.36%
法律服務業	3,654	8,668	59,069	50,946	13.75%
會計服務業	11,860	17,170	62,662	48,491	22.61%
廣告業及市場研究業	12,446	25,875	52,873	51,169	3.22%
保全及偵探業	80,065	14,013	35,424	41,888	-18.25%
美髮及美容美體業	1,749	38,354	38,121	28,751	24.58%
其他專門營造業	132,044	37,127	45,520	31,301	31.24%
餐館業	143,171	168,226	33,492	30,582	8.69%

T.W. Average Monthly Earnings, Selected Occupations, 2020/9

Occupation	# of Men	# of Women	Men Salary	Women Salary
電力供應業	23,306	4,097	\$76,155	\$70,338
氣體燃料供應業	4,501	1,387	71,639	59,737
用水供應業	4,550	1,769	59,044	64,055
其他專門營造業	132,044	37,127	45,520	31,301
公共汽車客運業	20,559	2,522	50,165	33,615
其他汽車客運業	8,084	2,598	29,212	29,471
汽車貨運業	55,991	16,676	37,407	32,357
航空運輸業	10,040	12,816	115,937	52,910
郵政業	17,623	8,508	54,104	52,569
快遞業	12,000	7,263	57,199	57,304

T.W. Average Monthly Earnings, Selected Occupations, 2020/9

Occupation	# of Men	# of Women	Men Salary	Women Salary
銀行業	61,395	92,799	87,743	80,433
人身保險業	38,025	78,839	68,965	93,093
財產保險業	8,587	8,745	54,841	44,222
其他保險輔助業	438	545	131,969	108,504
證券期貨及金融輔助業	21,151	30,376	82,666	72,691
不動產開發業	24,661	20,914	79,210	57,761
不動產經營&相關服務業	34,628	43,415	39,904	50,252
企業總管理機構&管顧業	38,919	40,728	59,555	51,673
專門設計業	23,644	4,741	68,479	49,045

行政院主計總處受僱員工薪資調查統計 2020/09

Gender Wage Gap in Taiwan

資料來源：勞動部統計處

	國中以下	高中/高職	專科	大學	碩士以上
工業及製造業	275	583	549	531	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
電力及熱氣供應業	144	1054	618	254	301
供水供應及污染控制業	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
資訊及通訊媒體業	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

2020/12/18 Earnings and Discrimination Joseph Tao-yi Wang

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 (unpleasantness, difficulty, safety)
 - Coal miners 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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Weekly Earnings of Full-Time Employed Persons age 25+ by education, 2019:Q2

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

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Weekly Earnings of Full-Time Employed Persons age 25+ by education, 2019:Q2 (TAIWAN 2019)

Educational attainment	Median weekly earnings	TAIWAN median (US\$1=NT\$28.5)
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

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Weekly Earnings of Full-Time Employed Persons age 25+ by education, 2016:Q1 (TAIWAN 2013)

Educational attainment	Median weekly earnings	TAIWAN median (US\$1=NT\$31.5)
P. S. and below	\$ 494	\$ 168
Mid. school (vocal.)		231
H.S. diploma	679	250
Some college or Associate degree	782	311
Bachelor's degree only	1,155	296
Advanced degree	1,435	510

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Human Capital

• Human capital

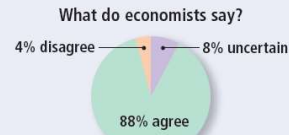
- Accumulation of investments in people, such as education and on-the-job training
- Affects productivity, labor demand, wages
 - Firms, demanders of labor, are willing to pay more for highly educated workers (higher marginal products)
 - Workers, suppliers of labor, are willing to pay the cost of becoming educated only if there is a reward for doing so (higher wages)

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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.

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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:**
 - 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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The Increasing Value of Skills

	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%

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

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The Non-Increasing Value of Skills (Taiwan)

(US\$1=NT\$28.5)	1992	2019
High school Median salary	\$12,418	\$15,260
Associate , some college	\$16,371	\$19,379
Percent extra for associate	+31.8%	+27.0%
College graduates	\$21,468	\$17,871
Percent extra for college	+72.9%	+17.1%
Advanced degree	\$24,527	\$29,779
Percent extra for advanced	+97.5%	+95.1%

The earnings gap between college-educated and non-college-educated workers hasn't widened in recent decades.

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Ability, Effort, and Chance – 1

- **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.

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Ability, Effort, and Chance – 2

- **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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CASE STUDY

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

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CASE STUDY

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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CASE STUDY

The Benefits of Beauty

Mei-Hsuan Chen (2009) find that among Taiwanese 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 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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Active Learning 1: 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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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

- Superstars in their field (ex: 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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Above-Equilibrium Wages – 1

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 – 2

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: Which Job Earns More?

In each case, 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.
- A trucker who hauls produce or a trucker who hauls hazardous waste.
- College graduate of NTU or an equally intelligent and capable graduate of NTUST (天大地大...).
- 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 2: Answers A, B

- 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.
- 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, D

- College graduate of NTU or an equally intelligent and 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.
- Someone who graduated from NTU 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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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

- 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.
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%

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Source: 民國 108/102/96/83/65 年家庭收支調查

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...

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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

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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

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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

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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

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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 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: job applicants with white names received about 50% more calls
 - Discrimination occurred for all types of employers (What about Asian names?)

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CASE STUDY

Is Emily More Employable Than Lakisha?

- Economist Philip Oreopoulos (AEJ: Policy 2011), Canadian labor markets
 - 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

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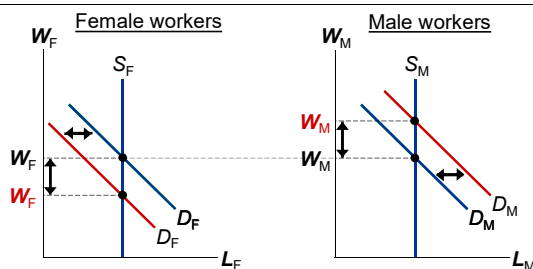
Discrimination by Employers

- 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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EXAMPLE 1: 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

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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

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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

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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

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EXAMPLE 2: 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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THINK-PAIR-SHARE

To eliminate wage differentials due to discrimination, the government creates a panel to decide what jobs should pay so that people of similar skills and education earn the same amount.

- 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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THINK-PAIR-SHARE

- 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?

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CHAPTER IN A NUTSHELL

- Above-equilibrium wages are due to: minimum-wage laws, unions, and efficiency wages.
- 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.

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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 the impact of discrimination on wages: nondiscriminatory firms will be more profitable than discriminatory firms.
- 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 & 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

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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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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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Earnings and Discrimination

Joseph Tao-yi Wang

Screening (篩選機制)

1. "稀飞取踢" Inc. Offers 2 Cell Phone Plans:
 - ▶ Plan A: \$1 per minute
 - ▶ Plan B: \$168 monthly for 300min, then \$1.5/min
 2. Here is your usage if Your Card is:
 - ▶ ♠: Usage is 0-100min/mo
 - ▶ ♥: Usage is 200-300min/mo
 - ▶ ♦: Usage is 400-500min/mo
 - ▶ ♣: Usage is 600-700min/mo
- | 套餐名称 | 固定话费 | 手机话费 | 赠送分钟 | Line 号码 |
|------|-------|-------|-------|---------|
| 月费包含 | 168 | 469 | 288 | 399 |
| 月费包含 | 2168 | 2168 | 2168 | 2168 |
| 超出分钟 | 无 | 超出分钟 | 无 | 超出分钟 |
| 超出分钟 | 30分钟 | 100分钟 | 30分钟 | 100分钟 |
| 超出分钟 | 无 | 无 | 200分钟 | 200分钟 |
| 超出分钟 | 248分钟 | 248分钟 | 128分钟 | 128分钟 |
| 超出分钟 | 无 | 512分钟 | 无 | 512分钟 |
| 超出分钟 | 512分钟 | 512分钟 | 512分钟 | 512分钟 |
| 超出分钟 | 512分钟 | 512分钟 | 512分钟 | 512分钟 |
| 超出分钟 | 512分钟 | 512分钟 | 512分钟 | 512分钟 |
3. Which Plan Would You Choose? Why?

電影名稱	大馬戲	中環廣場	維多利亞	UIN MOBILE
萬籟天	16K12 168	469	288	
鬥機皇	168	469	288	
鬥機皇	21M到12點	21M到12點	21M到12點	21M到12點
龍鳳喜相逢	免費	贈送五分鐘	免費	免費
龍鳳喜相逢	30分鐘	25分鐘	30分鐘	30分鐘
龍鳳喜相逢	30分鐘	10分鐘	0分鐘	30分鐘
龍鳳喜相逢	吉米利連連舞			200%+2%
龍鳳喜相逢	免費	贈送	免費	贈送免費電影券
龍鳳喜相逢	24點	24點	12點半	12點半
龍鳳喜相逢	免費	免費	免費	免費
龍鳳喜相逢	\$27/張	\$47/張	\$67/張	\$6.6/張
龍鳳喜相逢	\$27/張	\$67/張	\$57/張	\$67/張
龍鳳喜相逢	亞太區、東南亞、香港	東南亞、香港	東南亞	亞洲

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Screening (篩選機制)

1. **A Set of Rules**
 - ▶ Different cell phone plans
2. **Individuals Optimize**
 - ▶ Which saves me the most money?
3. **You React to Others Optimizing**
 - ▶ Want a free iPhone X? Get a new line!
4. **What Should Aggregate Data Look Like?**
 - ▶ Separating equilibrium says ♠♣ choose plan A, while ♥♦ choose plan B

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Screening (篩選機制)

5. Does Empirical Data Match the Theory?
 - ▶ How many ♠♣ (♥♦) really choose plan A(B)?
6. Can Individual Differences be Explained?
 - ▶ If you are different, what were you thinking?
7. How Can the Institution (Rules) Improve?
 - ▶ What would you do as a marketing manager?
8. Where Did this Institution Come From?
 - ▶ Copied from other countries? Only one approved?

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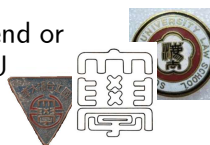
Applications of Screening (篩選機制的應用)

- ▶ Screening Devices designed to **Differentiate**
 - ▶ Let some choose Plan A, others **Plan B**
- ▶ Examples:
 - ▶ **Marketing Campaigns** Target Specific Groups
 - ▶ Student/NP plans of cell phone companies
 - ▶ BOGO, 2nd pair 50% off, 2nd bottle 41% off...
 - ▶ **HR Screen CVs** Based on Certain Criteria
 - ▶ Ivy League, GPA, extra-curriculum activities, GIS
 - ▶ Students try their best to satisfy those criteria

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Signaling (認證標籤)

1. Expected Salary if you graduate from:
 - ▶ ♥♦: National iDaiwan University: 35k/mo
 - ▶ ♠♣: Private Salty Chicken University: 22k/mo
2. If you go to graduate school at NiDU:
 - ▶ Expected salary 40k/mo, but need to repay student loans @ 5k/mo
3. Would you (advise your friend or your son to) apply for NiDU graduate school? Why?



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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 實局理論與策略思考 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** (2nd yr), **Linear Algebra** (1st 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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