


Seventh Edition

Principles of
Economics
N. Gregory Mankiw



CHAPTER 19 Earnings and Discrimination

Modified by Joseph Tao-yi Wang

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In this chapter,
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, 2010

Occupation	Both sexes	Men	Women	Gender gap
Chief executives	\$1949	\$2217	\$1598	38.7%
Lawyers	1757	1895	1461	29.7%
Physicians, surgeons	1975	2278	1618	40.8%
Architects & engineers	1255	1293	1040	24.3%
Management	1230	1414	1018	38.9%
Registered nurses	1055	1201	1039	15.6%
High school teachers	987	1035	962	7.6%
Counselors	808	780	818	-4.6%
Retail salespersons	527	651	421	54.6%
Waiters/waitresses	401	450	381	18.1%
All occupations	\$747	\$824	\$669	23.2%

T.W. Average Monthly Earnings, Selected Occupations, 2014/9

Occupation	# of M	# of F	Salary (M)	Salary (F)	Gender Gap
銀行業	58,586	85,171	\$87,876	\$74,772	17.5%
電子零組件製造業	283,815	307,462	57,123	42,344	34.9%
電腦電子產品光學製品製造	116,408	99,035	66,913	41,207	62.4%
電力供應業	21,248	2,956	134,521	116,648	15.3%
金融及保險業	141,993	228,519	78,536	71,694	9.5%
專業科學及技術服務業	134,159	115,612	57,926	47,619	21.6%
醫療保健服務業	64,378	264,632	91,632	49,708	84.3%
航空運輸業	9,755	10,866	100,201	51,824	93.3%
法律服務業	3,524	6,774	54,756	47,930	14.2%
會計服務業	7,472	14,724	61,815	48,197	28.3%
廣告業及市場研究業	16,954	26,641	45,758	51,121	-10.5%
保全及私家偵探服務業	78,556	11,166	30,196	37,659	-19.8%
美髮及美容美體業	1,600	26,513	31,376	25,465	23.3%
營造業	386,195	73,607	44,303	31,587	40.3%
餐館業	109,069	139,814	30,090	26,899	11.9%

T.W. Average Monthly Earnings, Selected Occupations, 2014/9

Occupation	# of Men	# of Women	Men Salary	Women Salary
電力供應業	21,248	2,956	\$134,521	\$116,648
氣體燃料供應業	3,917	1,162	66,838	47,390
用水供應業	4,393	1,763	170,124	169,718
鐵路大眾捷運運輸業	19,702	4,472	52,787	42,500
公共汽車客運業	19,816	2,364	47,260	30,713
其他汽車客運業	9,222	2,594	26,959	26,744
汽車貨運業	59,330	14,582	33,297	28,772
航空運輸業	9,755	10,866	100,201	51,824
郵政業	18,120	7,981	143,946	137,297
快遞服務業	7,168	4,204	49,124	46,659

T.W. Average Monthly Earnings, Selected Occupations, 2014/9

Occupation	# of Men	# of Women	Men Salary	Women Salary
銀行業	58,586	85,171	\$87,876	\$74,772
人身保險業	33,166	74,986	67,758	72,675
財產保險業	7,627	7,520	53,342	42,006
其他保險退休基金輔助業	215	257	95,999	72,430
證券期貨及其他金融業	22,193	32,059	82,752	73,447
不動產開發業	23,156	20,100	52,268	46,557
不動產經營相關服務業	36,531	38,124	31,875	43,499
企業總管理機構及管顧業	40,935	41,232	51,453	46,957
專門設計服務業	19,740	3,343	68,836	51,586

行政院主計總處受僱員工薪資調查統計 2014/09

Introduction

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

Compensating Differentials

- **Compensating differential:** a difference in wages that arises to offset the nonmonetary characteristics of different jobs
- These characteristics include unpleasantness, difficulty, safety. Examples:
 - 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.

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 also affected by chance
 - E.g., new discoveries no one could have predicted make some occupations obsolete, increase demand in others.

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.

Case Study: 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.

Case Study: The Benefits of Beauty

Hypotheses:

1. Good looks matter for productivity
 - In jobs where appearance is important, attractive workers are more valuable to the firm, command higher pay.
2. Good looks indirectly related to ability
 - People who make an effort to project an attractive appearance may be smarter or more competent in other ways.
3. Discrimination

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 \$1,1xx, while height increases it by \$5x/cm and weight decreases it by \$5x/kg
3. Consistent with the story that “good looks indirectly related to ability (self-confidence)”

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The Superstar Phenomenon

- Superstars like Chih-Ling Lin, F4 earn many times more than average in their fields.
- The best plumbers or carpenters do not.
- Superstars arise in markets that have two characteristics:
 - Every customer in the market wants to enjoy the good supplied by the best producer.
 - The good is produced with a technology that allows the best producer to supply every customer at a low cost.

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Human Capital

- **Human capital:** the accumulation of investments in people, such as education and on-the-job training
- Human capital affects productivity, and thus labor demand and wages.

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Weekly Earnings of Full-Time Employed Persons Age 25+ by Education, 2012:Q4

Educational attainment	Median weekly earnings
Less than H.S.	\$ 478
H.S. diploma	647
Some college or Associate degree	752
Bachelor's degree	1,071
Advanced degree	1,379

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Weekly Earnings of Full-Time Employed Persons by Education, 2013 (Compared to Age 25+/2012Q4 for US)

Educational attainment	Median weekly earnings	TAIWAN median (US\$1=NT\$31.5)
P. S. and below	\$ 478	\$ 168
Mid. school (vocal.)		231
H.S. diploma	647	250
Associate/Some col.	752	311
Bachelor's degree	1,071	296
Advanced degree	1,379	510

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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

	1980	2012
Men	44%	69%
Women	35%	64%

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The Increasing Value of Skills



Taiwan also has an earnings gap between college-educated and non-college-educated workers.

Percentage difference in annual earnings for advance degrees in Taiwan (2013)		
	Advanced	Bachelor
vs. High S.	104%	19%
vs. J. High	121%	28%

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The Increasing Value of Skills

Two hypotheses:

- 1. International trade**
Rising exports of goods made with skilled labor, rising imports of goods made with unskilled labor.
- 2. Skill-biased technological change**
New technologies have increased demand for skilled workers, reduced demand for unskilled workers.

Difficult to determine which hypothesis better explains the widening earnings gap; probably both are important.

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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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The Signaling Theory of Education

An alternative view 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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篩選機制(Screening)

- 「稀ㄟ取踢」電信公司的資費方案：
 - 方案A：一分鐘一塊錢
 - 方案B：月租費168可打300分鐘，之後1.5元/分
- 每個人拿到一張牌，如果你的牌面花色是
 - 黑桃：每個月打0-100分鐘
 - 紅心：每個月打200-300分鐘
 - 方塊：每個月打400-500分鐘
 - 梅花：每個月打600-700分鐘
- 要選哪一個資費方案才最省錢？為什麼？

篩選機制(Screening)

- What should the aggregate data look like?
 - 分離均衡(Separating equilibrium)的預測是黑桃和梅花選擇方案A，方塊和紅心選擇方案B
- Does empirical data match the theory?
 - 剛剛有多少拿黑(紅)色牌的人真的選方案A(B)?
- Can individual differences be explained?
 - 如果你是「特例」，你是怎麼想的呢？
- How can the institution (rules) be improved?
 - 如果你是行銷經理，下次你會怎麼做？

光環效果(Signaling)

1. 假設你高中畢業後考上
 - 紅色牌：國立愛呆丸大學，畢業後月薪35k
 - 黑色牌：私立酥粥大學，畢業後月薪22k
2. 大四上，你可以選擇：
 - 是否報考愛呆丸大學研究所，畢業後月薪40k，但須負擔就學貸款（和補習貸款）月繳5k
3. 請問你會不會報考研究所？為什麼？

光環效果(Signaling)

4. What should the aggregate data look like?
 - 有志一同均衡(Pooling equilibrium)的預測是所有人都選擇報考研究所，雖然拿紅色牌的愛呆丸大學的畢業生覺得沒差。（其他均衡呢？）
5. Does empirical data match the theory?
 - 剛剛有多少拿黑(紅)色牌的人真的選擇考研究所？
6. Can individual differences be explained?
 - 如果你是拿紅色牌的人，你是怎麼選擇的呢？
7. How can the institution (rules) be improved?
 - 如果你是老闆會怎麼辦？如果你是教育部長呢？

What Course Are You Taking?

Your GPA serves two purposes:

- Signal you are a smart and responsible student
- Reflect the knowledge and abilities you accumulated in college

But what does “sweet and cheap GE” indicate?

- **What if I get a C in a tough course?** Is that worse than taking easy sweet and cheap's?
- Next year, should you take the “road to heaven” or the “deadly triangle”? (cf. NTUCourse on ptt)

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Some Personal Recommendations

- In your 2nd year, take:
 - Intermediate Micro (+ Game) by 古慧雯 or 黃貞穎
 - Statistics and Econometrics by 陳旭昇+駱明慶
- In your 3rd and 4th year, take:
 - 市場與台灣經濟發展 by 吳聰敏(Capstone Course on “Economist”, Presentation and Writing)
 - Try one of Micro, Macro or Econometric Theory
 - Master-level electives (駱明慶, 陳虹如, 李怡庭,...)
 - Former master level courses
 - English Composition (2 yr) or other languages
- Apply for exchange programs such as BESAP

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Some Personal Recommendations

- Find your interest:
 - Take 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 or Advanced Calculus)
 - **Communication** (writing and oral presentation)
 - **Programming Skills**

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Some Personal Recommendations

- Interested in micro-economics?
 - Master **Intermediate Micro** and take **Micro Theory I**
- Like the experiments I run?
 - Signup for more experiments at TASSEL lab
 - 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**, **Linear Algebra** and **Advanced Statistical Inference** from NTU Math
 - Take 2 years of **English Composition (I and II)**
 - Start to do research now!

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Reasons for Above-Equilibrium Wages

1. Minimum wage laws

The minimum wage may exceed the eq'm wage of the least-skilled and experienced workers.

2. Unions

Union: a worker association that bargains with employers over wages and working conditions

Unions use their market power to obtain higher wages; most union workers earn 10–20% more than similar nonunion workers.

Reasons for Above-Equilibrium Wages

3. Efficiency wages

Efficiency wages: above-equilibrium wages paid by firms to increase worker productivity

Firms may pay higher wages to reduce turnover, increase worker effort, or attract higher-quality job applicants.

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 or the world's best writer
- 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 with a 3.7 GPA or someone who graduated from the same university with a 2.4 GPA

ACTIVE LEARNING 2

Answers

- A. The best physical therapist on the planet or the best writer on the planet
*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.*

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 grad has more ability than the NTUST grad.*
- D. 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.*

The Economics of Discrimination

- **Discrimination:** the offering of different opportunities to similar individuals who differ only by race, ethnicity, gender, or other personal characteristics

Gender Discrimination of Taiwan



1. Narrowing earnings gap between Taiwanese female and male workers.
2. "什麼都漲，就是薪水不漲?"
More true from men...

Wage Gender Gap of Taiwan (Average Disposable Income in NTD)			
	Male	Female	Diff.
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102/96/83/65年家庭收支調查

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Measuring Labor-Market Discrimination

- Median earnings of full-time U.S. workers, 2012:
 - White males earn 27% more than white females.
 - White males earn 33% more than black males.
- Taken at face value, these differences look like evidence that employers discriminate.
- But there are many possible explanations for wage differences besides discrimination; the data above do not control for differences in other factors that affect wages.

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Measuring Labor-Market Discrimination

Differences in human capital among groups:

- White males 75% more likely to have college degree than black males
- White males 11% more likely to have graduate degree than white females
- Women have less on-the-job experience than men
- Public schools in many predominantly black areas are of lower quality (e.g., funding, class sizes)

There may well be discrimination in access to education, but this problem occurs long before workers enter the labor force.

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Measuring Labor-Market Discrimination

Recent study by Bertrand and Mullainathan (AER 2004) finds evidence of labor-market discrimination:

- 5000 fake résumés sent in response to "help wanted" ads.
- Half had names more common among blacks, like Lakisha Washington or Jamal Jones. The other half had names common among whites, like Emily Walsh or Greg Baker. Otherwise, the résumés were the same.
- The white names received 50% more calls from interested employers than the black names.

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Discrimination by Employers

- Competitive markets provide a natural remedy for employer discrimination:

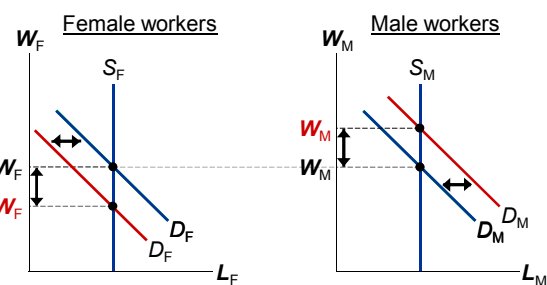
The profit motive...

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Discrimination by Employers

Discriminating firms will be outbid by non-discriminating firms. The profit motive forces firms to eliminate wage differentials. Result: A wage differential.



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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.

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.

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.
- Even without discrimination, the distribution of income may not be equitable or desirable. We explore this topic in the next chapter.

Summary

- Other things equal, wage differences compensate workers for job attributes: The harder or less pleasant a job, the more a worker is compensated.
- Workers with more human capital are more productive and command higher wages than workers with less human capital.
- Workers with college degrees may get better job offers because the degree signals high natural ability to employers.

Summary

- Wages also may differ with natural ability, effort, and chance.
- Wages are sometimes above their equilibrium levels, due to minimum wage laws, the market power of labor unions, and efficiency wages.
- Some differences in earnings are due to discrimination on the basis of race or other characteristics. Measuring the amount of discrimination is difficult, though.

Summary

- The profit motive tends to limit the impact of employer discrimination on wages.
- Discrimination by consumers or governments may lead to persisting wage differentials.

Earning 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, Problems 1, 6, 8.

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一對一的最後通牒談判 (Ultimatum Game)

- 三人一組，各組兩兩配對。配對的兩組有十張彩券
 - Form groups of 3. Each group is pair with another.
 - One group is the Proposer, the other the Respondent.
 - Each pair has 10 tokens
 - 一組為面試官，負責提議如何分配十張彩券
 - Proposers decide how many to give to Respondents
 - 可能的提議有10-0, 9-1, 8-2, 7-3, 6-4, 5-5,...
- 另一組為應徵者只能回覆接受與否
 - Respondents can either accept the split, or reject so that both get nothing
- 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