


N. Gregory Mankiw

# Principles of Economics

Sixth Edition



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## Earnings and Discrimination

Premium PowerPoint Slides by  
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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%
<b>All occupations</b>	<b>\$747</b>	<b>\$824</b>	<b>\$669</b>	<b>23.2%</b>

**T.W. Average Monthly Earnings, Selected Occupations, 2012/9**

Occupation	# of Men	# of Women	Men Salary	Women Salary	Gender Gap
銀行業	57,740	82,701	\$83,268	\$68,876	20.9%
電子零組件製造業	278,655	289,532	74,066	54,178	36.7%
電力供應業	20,992	2,763	122,018	106,192	14.9%
金融及保險業	135,001	225,661	71,780	61,671	16.4%
專業科學及技術服務業	116,431	98,695	56,413	46,456	21.4%
醫療保健服務業	64,853	254,340	93,660	51,578	81.6%
航空運輸業	9,247	9,441	98,994	54,424	81.9%
法律服務業	3,251	5,903	46,924	44,017	6.6%
會計服務業	6,901	14,596	63,139	44,128	43.1%
廣告業及市場研究業	10,752	17,392	44,700	50,436	-11.3%
保全及私家偵探服務業	67,936	8,364	28,957	38,590	-25.0%
理髮及美容業	1,428	26,652	30,583	24,623	24.2%
營造業	368,714	72,817	43,241	29,817	45.0%
餐館業	85,548	113,599	27,739	24,124	15.0%

**T.W. Average Monthly Earnings, Selected Occupations, 2012/9**

Occupation	# of Men	# of Women	Men Salary	Women Salary
電力供應業	20,992	2,763	\$122,018	\$106,192
氣體燃料供應業	4,297	1,244	70,118	52,198
用水供應業	4,486	1,762	93,941	93,167
鐵路大眾捷運運輸業	19,045	3,769	53,419	43,091
公共汽車客運業	19,776	2,400	46,265	32,459
其他汽車客運業	9,642	2,672	24,284	24,838
汽車貨運業	57,371	12,007	35,729	31,175
航空運輸業	9,247	9,441	98,994	54,424
郵政業	18,473	7,513	56,110	56,692
快遞服務業	7,825	3,833	46,263	45,397

**T.W. Average Monthly Earnings, Selected Occupations, 2012/9**

Occupation	# of Men	# of Women	Men Salary	Women Salary
銀行業	57,740	82,701	\$83,268	\$68,876
人身保險業	34,091	85,720	58,791	56,521
財產保險業	7,295	7,147	54,430	42,012
其他保險退休基金輔助業	157	201	88,179	69,709
證券期貨及其他金融業	21,226	28,737	71,487	64,762
不動產開發業	19,807	17,623	46,800	41,976
不動產經營相關服務業	30,269	30,322	33,856	39,339
企業總管理機構及管顧業	37,168	37,711	52,704	47,191
專門設計服務業	15,739	2,900	67,440	53,103

行政院主計總處受僱員工薪資調查統計 2012/09

## Introduction

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

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## 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.

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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 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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## 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.

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## 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

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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 \$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, 2010:Q4

Educational attainment	Median weekly earnings
Less than H.S.	\$ 438
H.S. diploma	633
Some college or Associate degree	727
Bachelor's degree	1,049
Advanced degree	1,334

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### Weekly Earnings of Full-Time Employed Persons Age 25+ by Education, 2011

Educational attainment	Median weekly earnings	TAIWAN average (US\$1=NT\$29)
P. S. and below	\$ 448	\$ 61
Mid. school (vocal.)		164
S. vocational school		233
H.S. diploma	621	218
Associate/Some col.	720	334
Bachelor's degree	1,026	422
Advanced degree	1,336	

### 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	2008
Men	44%	88%
Women	35%	71%

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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 (2011)		
	Associate	≥ Bachelor
vs. High S.	27%	44%
vs. J. High	44%	64%

## 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：國立愛呆九大學，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：
  - 是否報考愛呆九大學研究所，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九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 ppt)

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## Some Personal Recommendations

- In your 2<sup>nd</sup> year, take:
  - Intermediate Micro (w/ Game) by 古慧雯 or 黃貞穎
  - Statistics and Econometrics by 陳旭昇 + 駱明慶
- In your 3<sup>rd</sup> and 4<sup>th</sup> 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 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. There is a (narrowing) earnings gap between female and male workers in Taiwan.
2. "什麼都漲，就是薪水不漲?" More true from men...

Wage Gender Gap of Taiwan (Total Yearly Income in NT dollars)			
	Male	Female	Diff.
2011	\$ 690,000	\$ 499,695	38%
2001	694,475	472,150	47%
1994	597,447	360,315	66%

Source: 民國100/90/83年家庭收支調查

### Measuring Labor-Market Discrimination

- Median earnings of full-time U.S. workers, 2010:
  - White males earn 24% more than white females.
  - White males earn 34% 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.

### 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.

### 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.

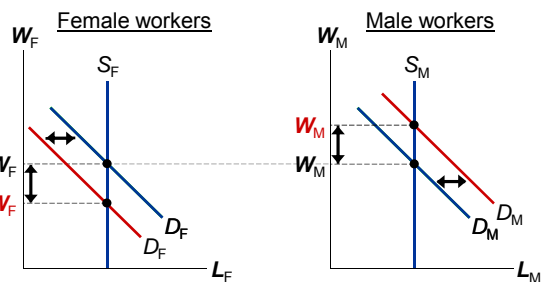
### Discrimination by Employers

- Competitive markets provide a natural remedy for employer discrimination:

The profit motive...

### Discrimination by Employers

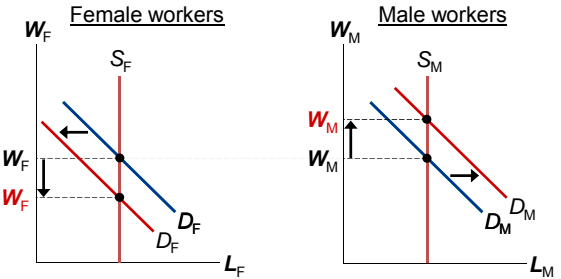
Discriminating firms will have to lose their workers. The only firms that can survive are organizations which attract entry of other, non-discriminating firms. Result: A wage differential.



### Discrimination by Employers

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

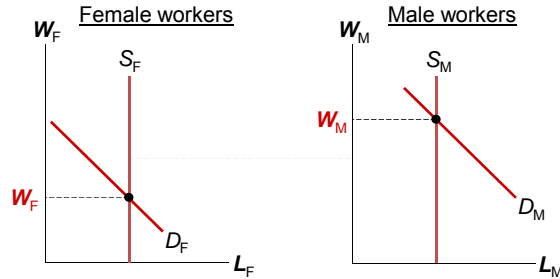
Result: A wage differential.



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### Discrimination by Employers

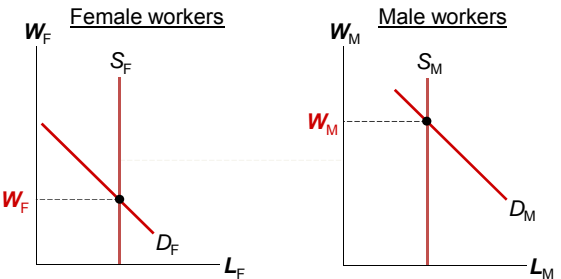
The non-discriminating firms can hire females for a lower wage, giving them a cost advantage and economic profits, which attract entry of other non-discriminating firms.



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### Discrimination by Employers

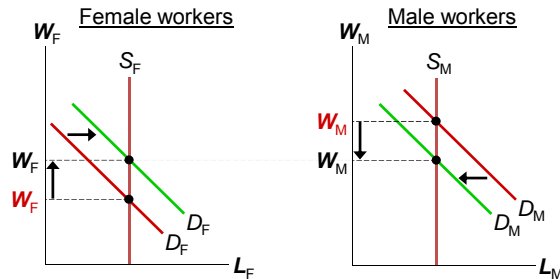
The discriminating firms will begin to lose money and be driven out of the market.



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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 20<sup>th</sup> 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.
- Even without discrimination, the distribution of income may not be equitable or desirable. We explore this topic in the next chapter.

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## 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.

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## 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.

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## 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.

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## 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, pp. 413-414, Problems 2, 5, 7, 8

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