
The Wage Structure

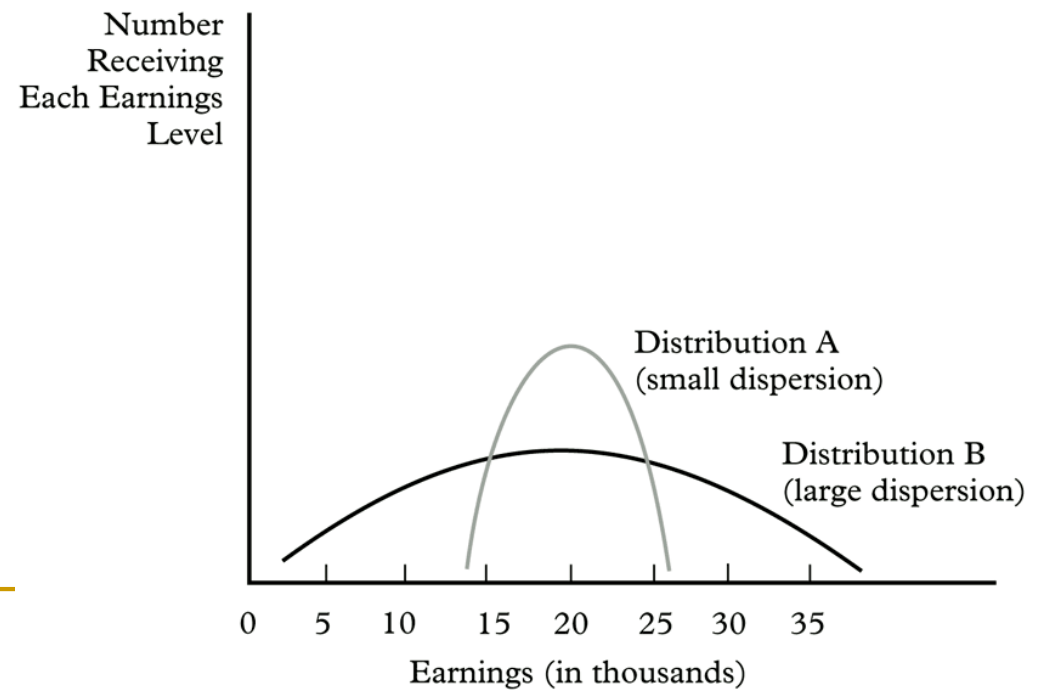
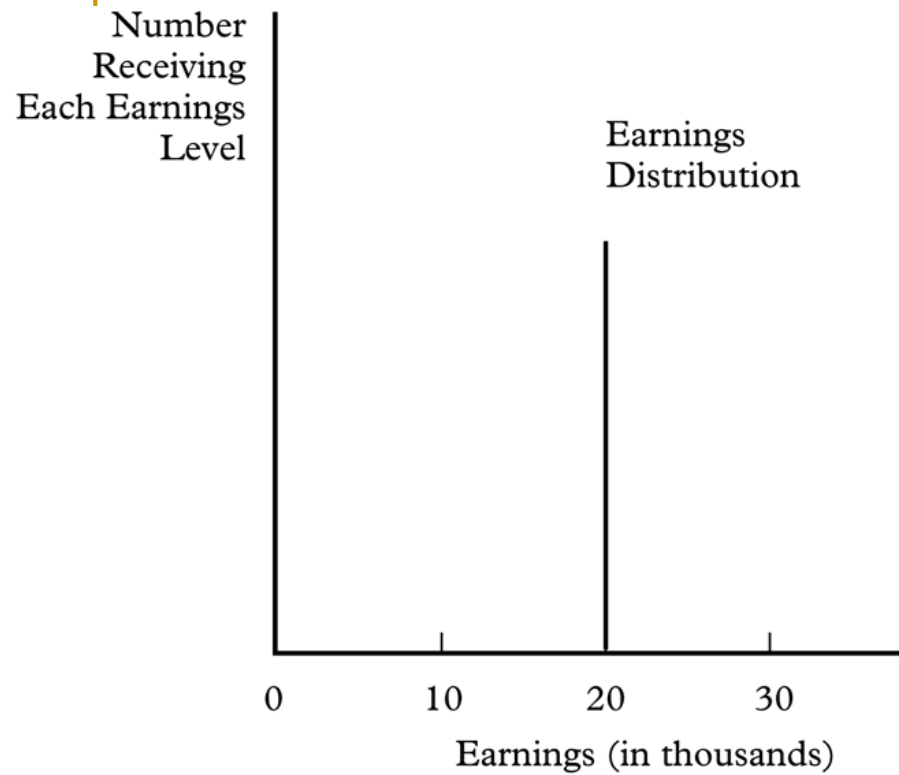
The Earnings Distribution

- The wage distribution is positively skewed.
 - A long right tail.
 - A small percent of workers earn disproportionately large shares of the rewards for work.
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Introduction

- Some workers will earn more than others.
 - Productivity differences.
 - Rate of return to skills differs.
 - This chapter considers the factors that contribute to the shape of the wage distribution.
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Earning Distribution

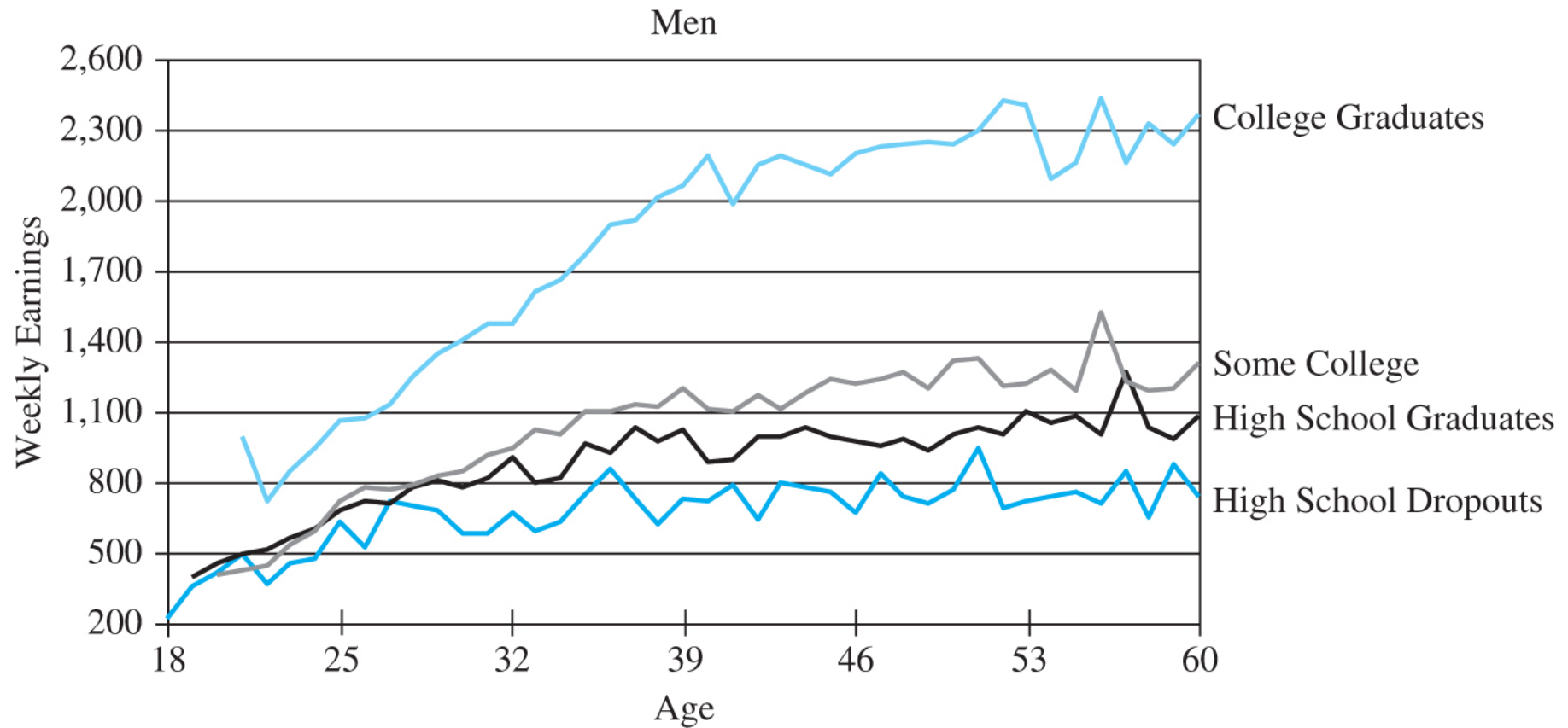


Post-School Human Capital Investments

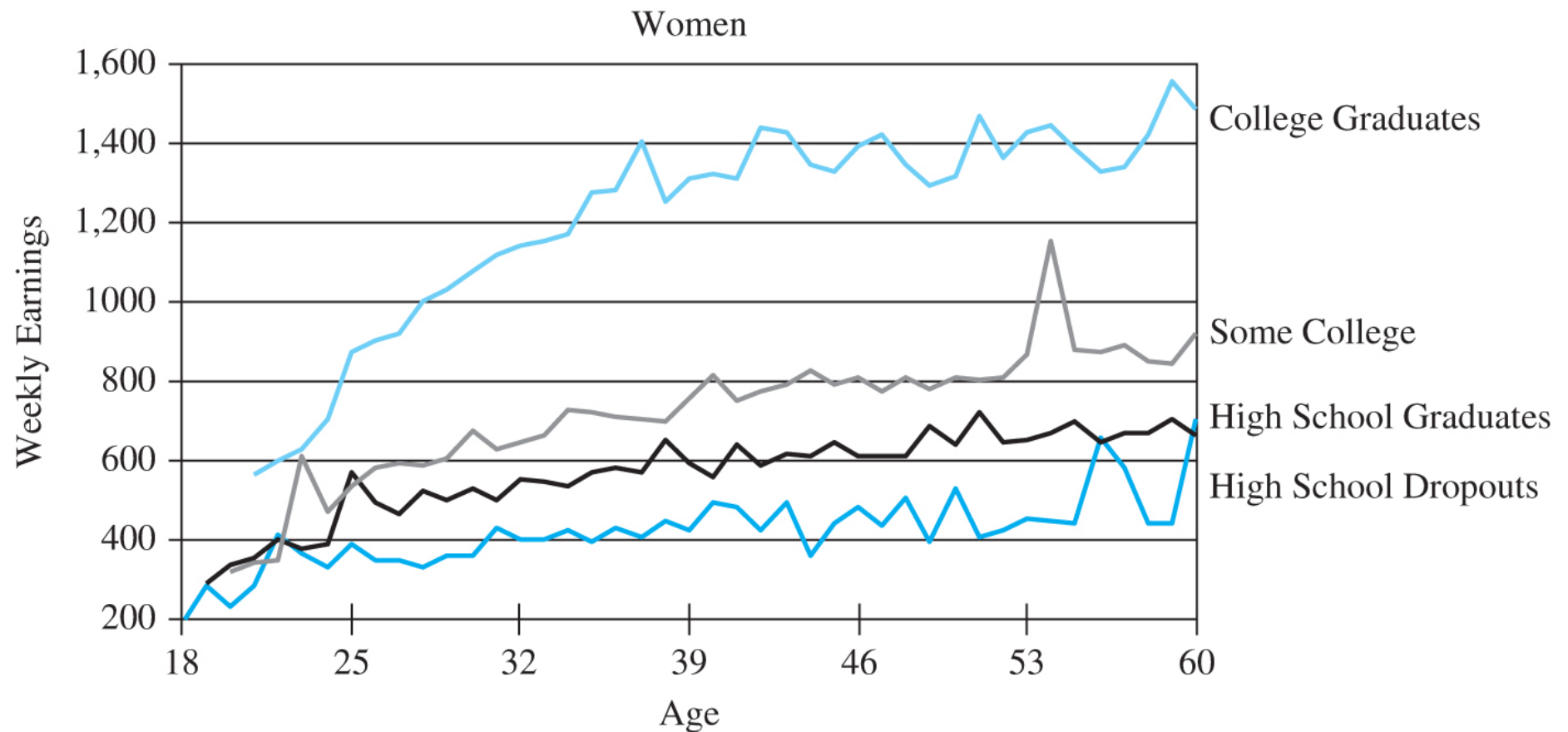
Three important properties of age-earnings profiles:

- Highly educated workers earn more than less educated workers.
- Earnings rise over time at a decreasing rate.
- The age-earnings profiles of different education cohorts diverge over time (they “fan outward”).
- Earnings increase faster for more educated workers.

Age-Earnings Profiles



Age-Earnings Profiles



On-The-Job Training

Most workers augment their human capital stock through on-the-job training (OJT) after completing education investments.

Two types of OJT:

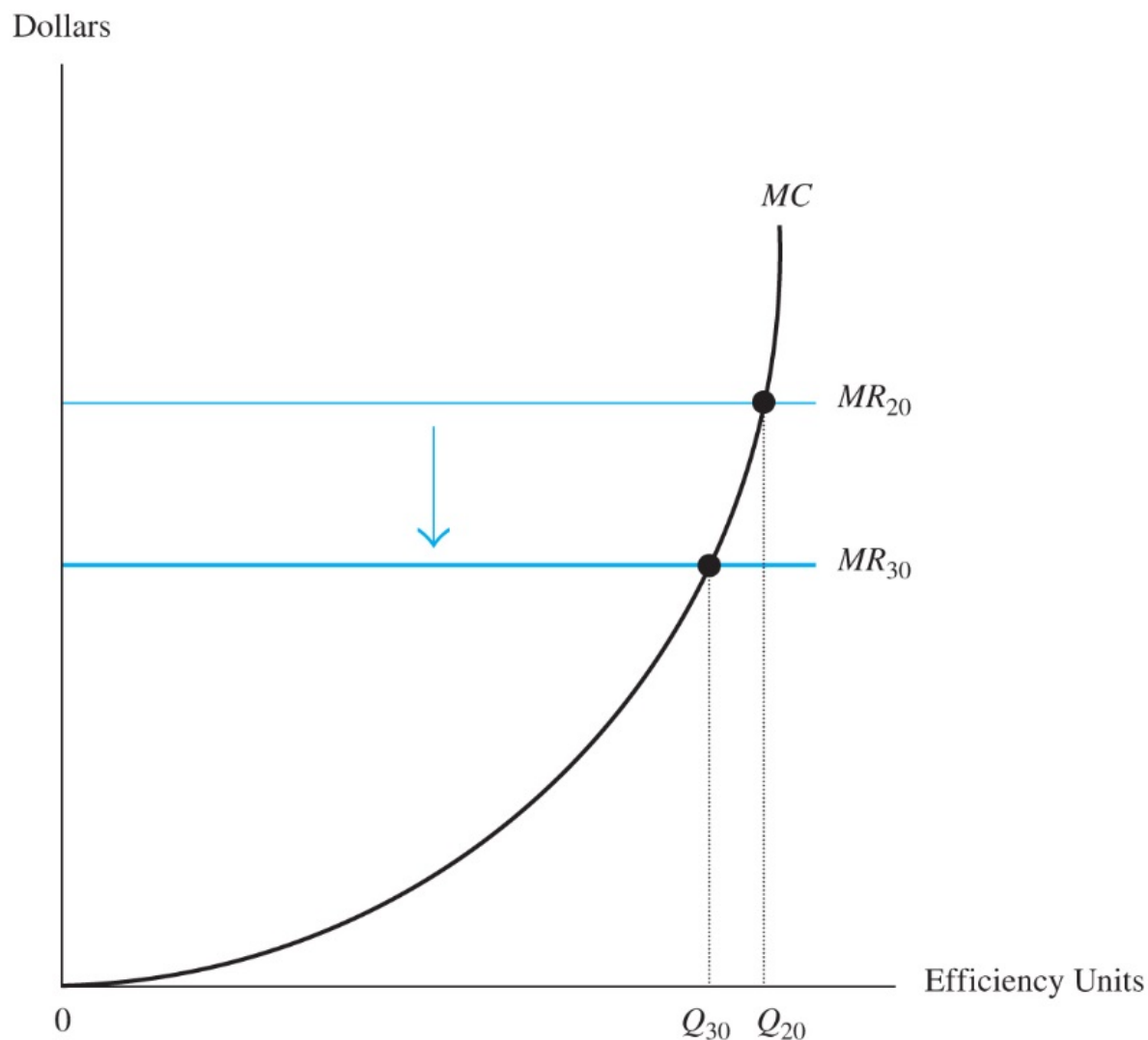
- General: training that is useful at all firms once it is acquired.
- Specific: training that is useful only at the firm where it is acquired.

Implications

Firms only provide general training if they do not pay the costs.

In order for the firm to willingly pay some of the costs of specific training, the firm must share in the returns to specific training. Engaging in specific training eliminates the possibility of the worker separating from the job in the post-training period.

The Acquisition of Human Capital Over the Life Cycle



The marginal revenue of an efficiency unit of human capital declines as the worker ages (so that MR_{20} , the marginal revenue of a unit acquired at age 20, lies above MR_{30}). At each age, the worker equates the marginal revenue with the marginal cost, so that more units are acquired when the worker is younger.

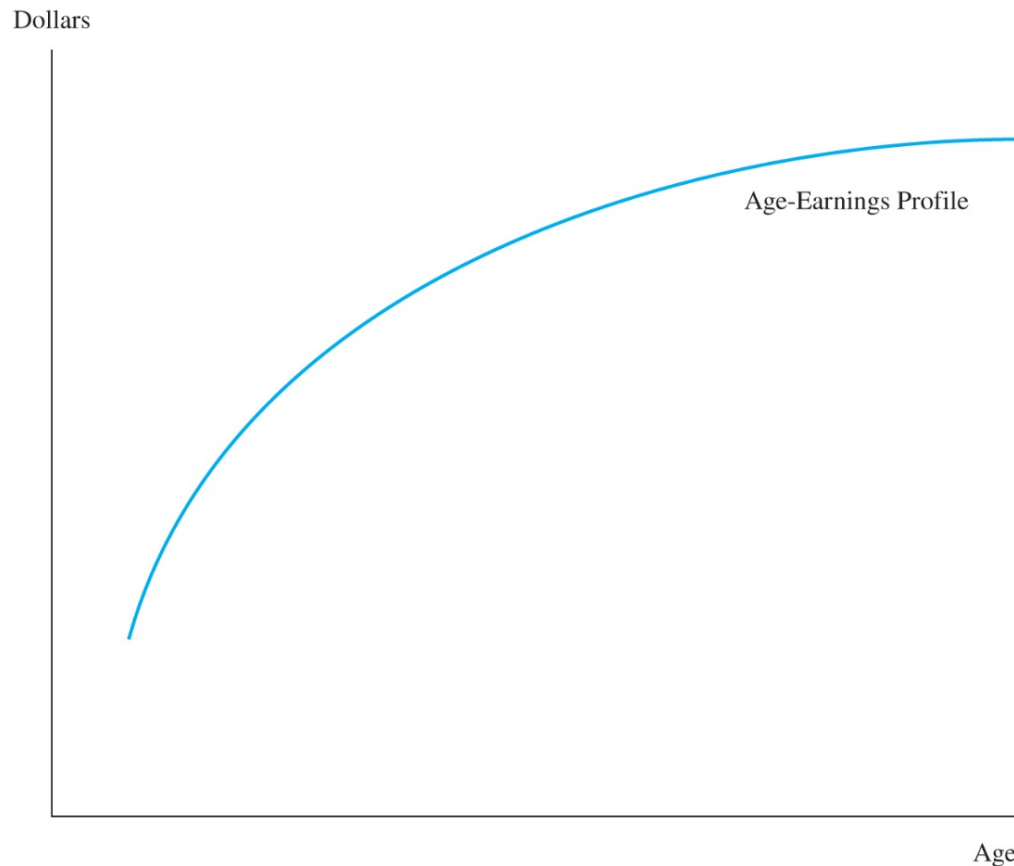
Age-Earnings Profiles and OJT

Human capital investments are more profitable the earlier they are taken.

The Mincer earnings function:

- $\text{Log}(w) = a \cdot s + b \cdot t - c \cdot t^2 + \text{other variables.}$
- The “overtaking age” is t^* and indicates the time when the worker slows down acquisition of human capital to collect the return on prior investments so as to “overtake” earnings of those that did not undertake similar investments.

The Age-Earnings Profile Implied by Human Capital Theory



The age-earnings profile is upward-sloping and concave. Older workers earn more because they invest less in human capital and because they are collecting the returns from earlier investments. The rate of growth of earnings slows down over time because workers accumulate less human capital as they get older.

Policy Application: Evaluating Government Training Programs

Aimed at exposing disadvantaged and low-income workers to training programs.

\$4 billion of federal spending per year.

Studies of the return to these human capital investments are unclear, largely because of self-selection bias.

Social Experiments

National Supported Worker Demonstration (NSW).

- Results of the NSW suggest a 10% return to investments in human capital for workers treated under the program.

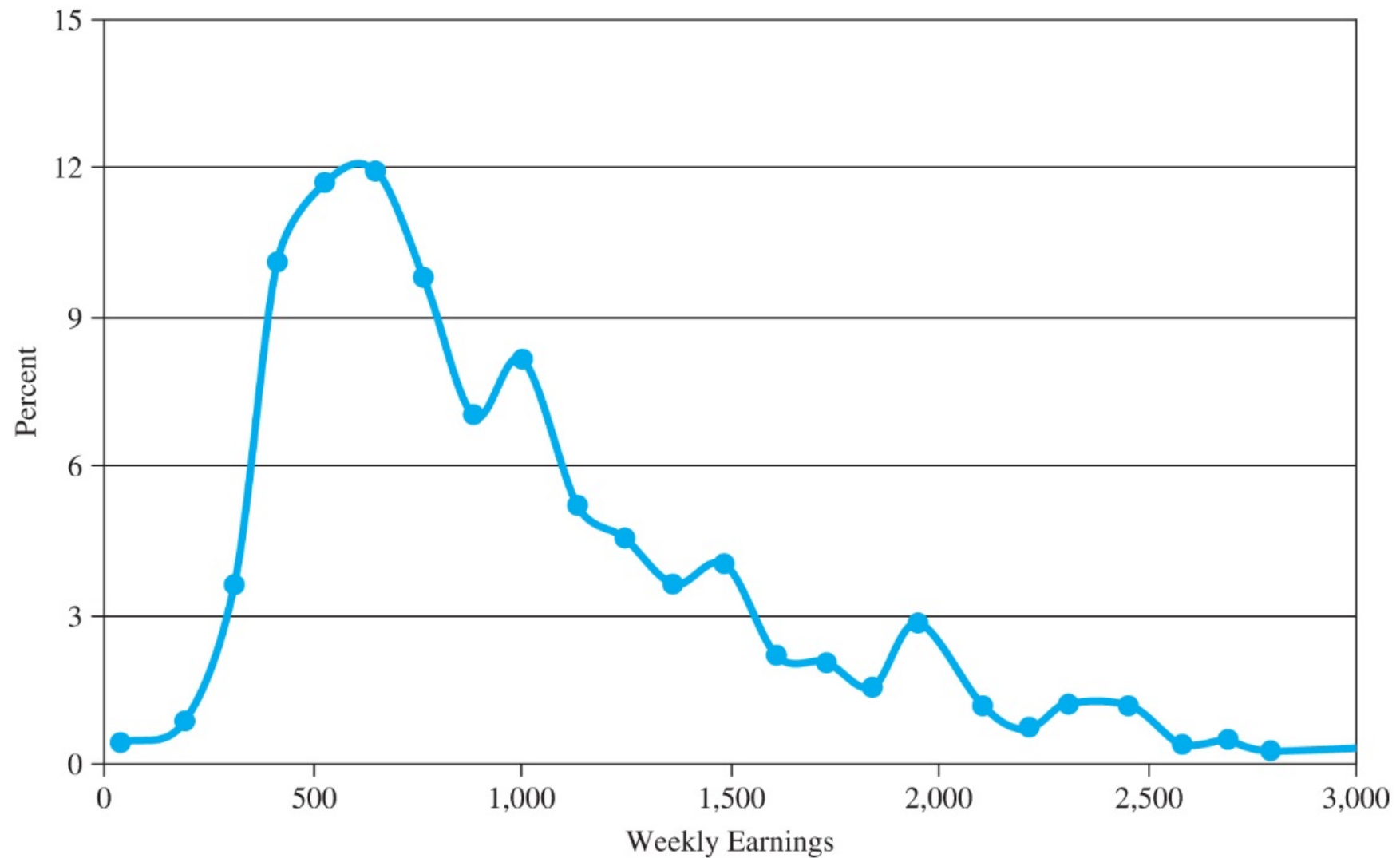
The Earnings Distribution

The wage distribution is positively skewed.

- A long right tail.

A small percent of workers earn disproportionately large shares of the rewards for work.

The Wage Distribution in the United States, 2012



International Differences in the Income Distribution

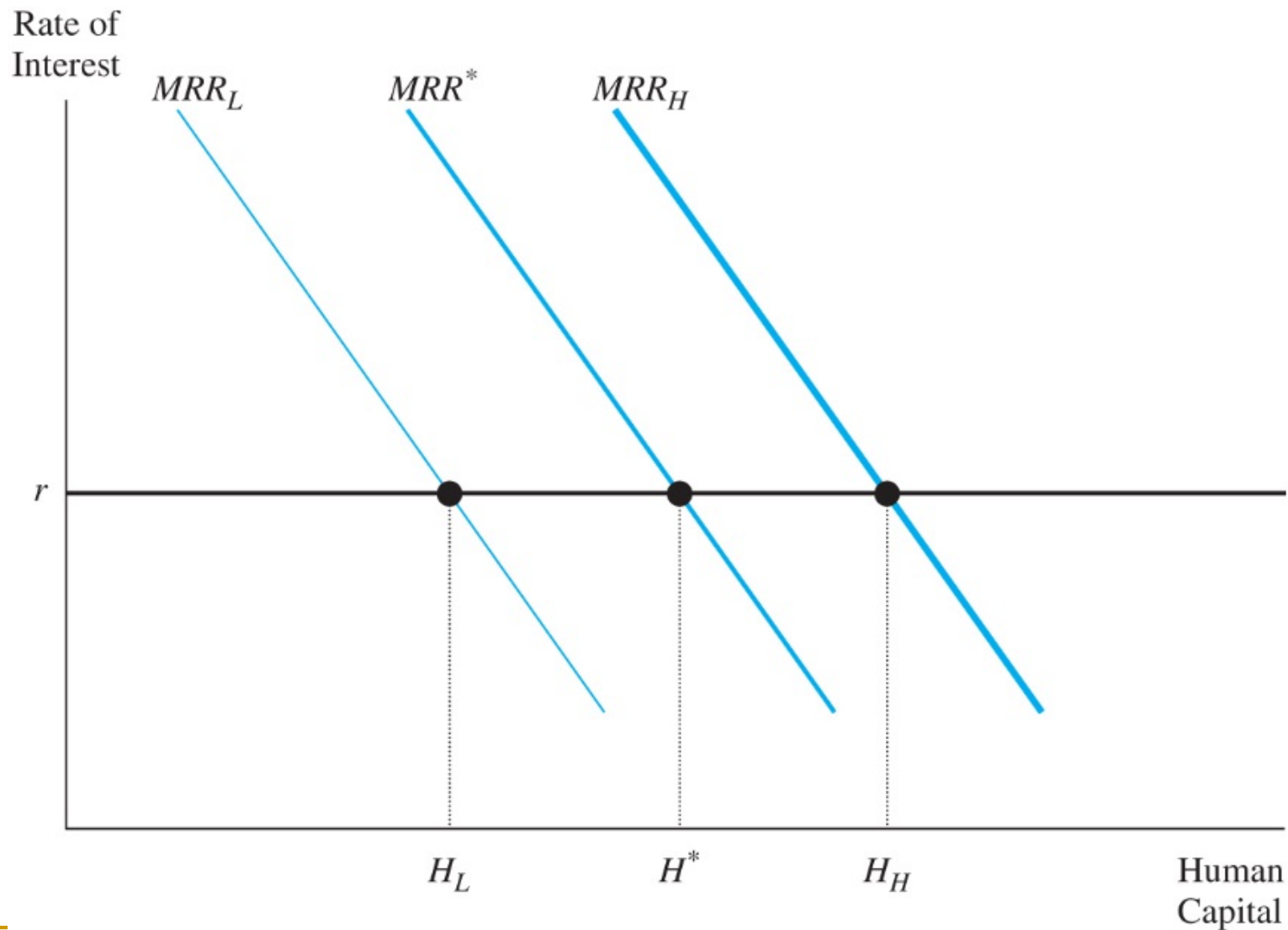
Source: World Bank, *World Development Indicators*, CD-ROM, 2002.

Country	Percentage of Total Income Received by Bottom 10% of Households	Percentage of Total Income Received by Top 10% of Households
Australia	2.0%	25.4%
Austria	2.3	22.4
Belgium	2.9	22.6
Canada	2.7	23.9
Chile	1.1	45.4
Dominican Republic	2.1	37.9
France	2.0	25.1
Germany	3.7	28.0
Guatemala	1.6	46.0
Hungary	4.1	20.5
India	3.5	33.5
Israel	2.4	28.2
Italy	1.9	27.4
Mexico	1.2	41.6
Norway	4.1	21.8
Sweden	3.4	20.1
United Kingdom	2.1	27.5
United States	1.8	30.5

Facts About the Earnings Distribution

- Wage differentials exist due to:
 - Human capital investments that vary from worker to worker.
 - Age differences. (Young workers are still accumulating human capital, while older workers are collecting returns from earlier investments.)
 - There is a positive correlation between ability and human capital investments, which “stretches out” wages in the population.
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Income Distribution When Workers Differ in Ability

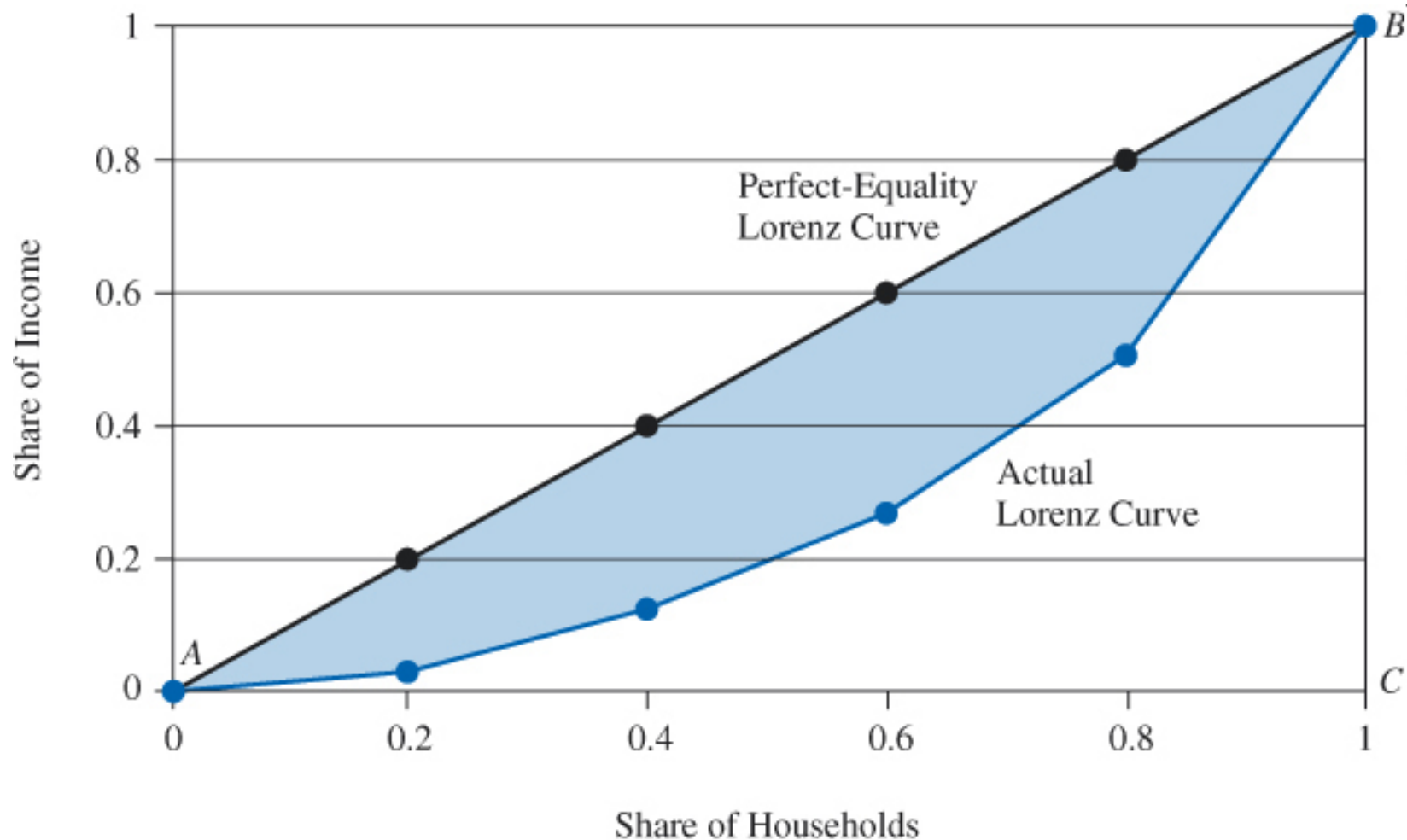


Measuring Inequality

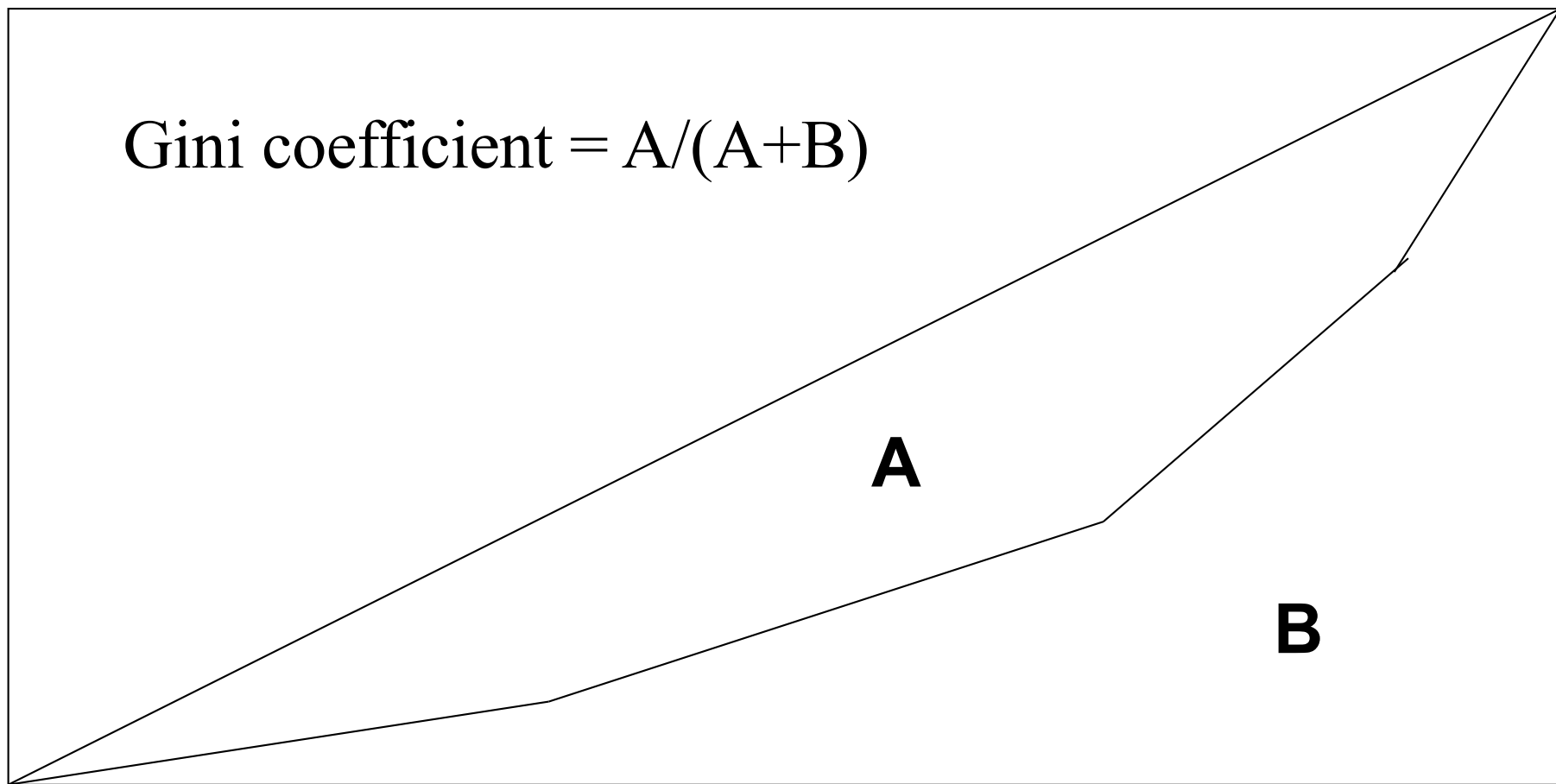
Lorenz curve

- the cumulative share of the income accruing to the various quintiles of households
 - The perfect-equality Lorenz curve must be a straight line with a 45 degree angle
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The Lorenz curve and the Gini coefficient



Share of income



Share of household

Gini coefficient

$$\text{Gini coefficient} = \frac{\text{Area between perfect – equality Lorenz curve and actual Lorenz curve}}{\text{Area under perfect – equality Lorenz curve}}$$

- Gini coefficient =0 when the actual distribution of income exhibits perfect equality
 - Gini coefficient =1 when the distribution of income exhibits perfect inequality (when all income goes to the highest quintile)
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Measuring Inequality: The Gini Coefficient and Wage Gaps

- The Gini coefficient:
 - Increases as inequality increases.
 - Summarizes the entire income distribution with a single number between 0 (perfect equality) and 1 (perfect inequality).
 - Wage gaps provide wage ratios between different percentiles in the distribution.
 - The 90-10 Wage Gap = 90^{th} percentile wage $\div$ 10^{th} percentile wage.
 - The 50-10 Wage Gap = 50^{th} percentile wage $\div$ 10^{th} percentile wage.
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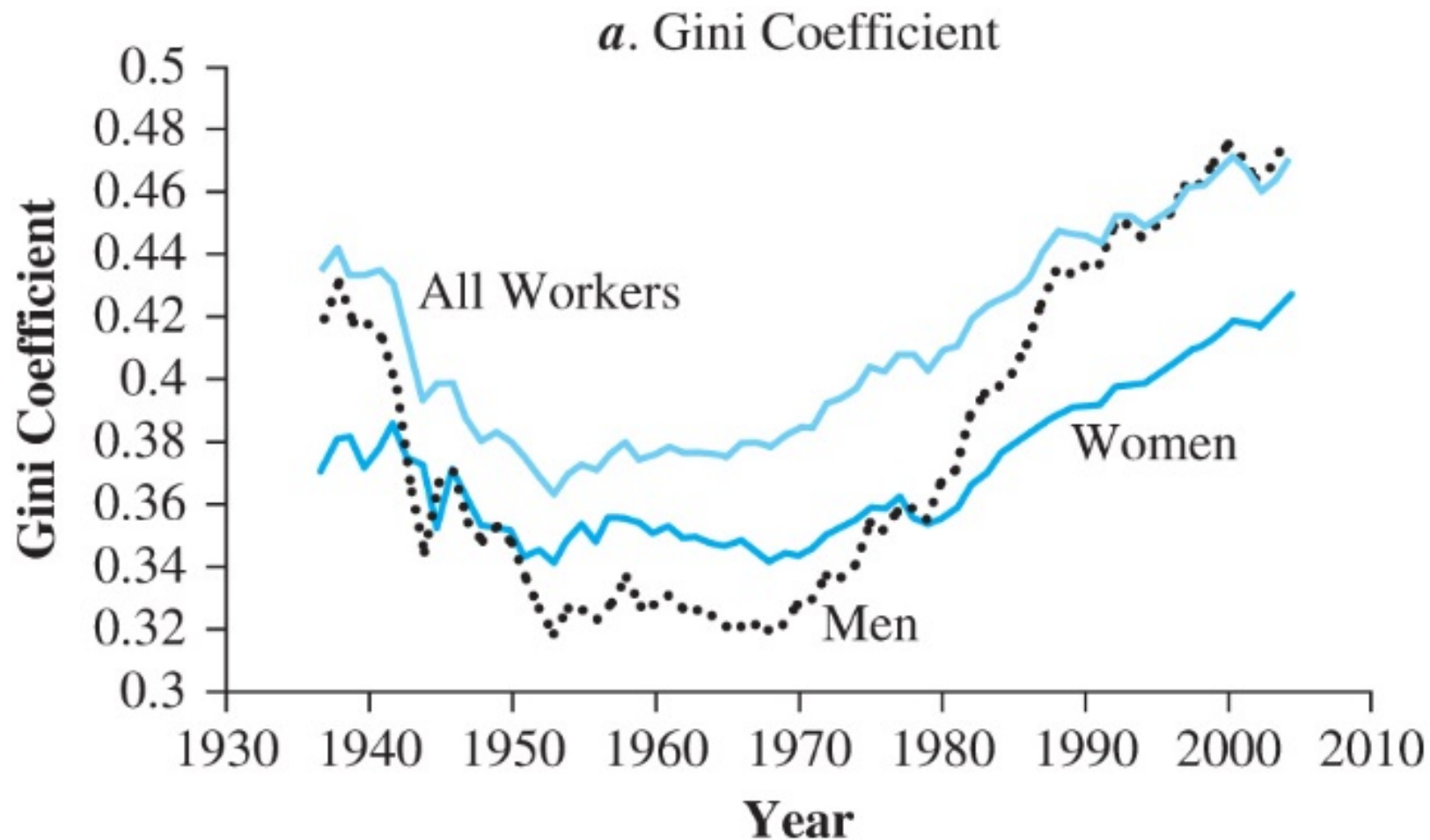
The Wage structure: Basic Facts

- The wage gap between those at the top of the wage distribution and those at the bottom widened dramatically
 - Wage differentials widen among education groups, among experience groups, and among age groups
 - Wage differentials widened within demographic and skill groups
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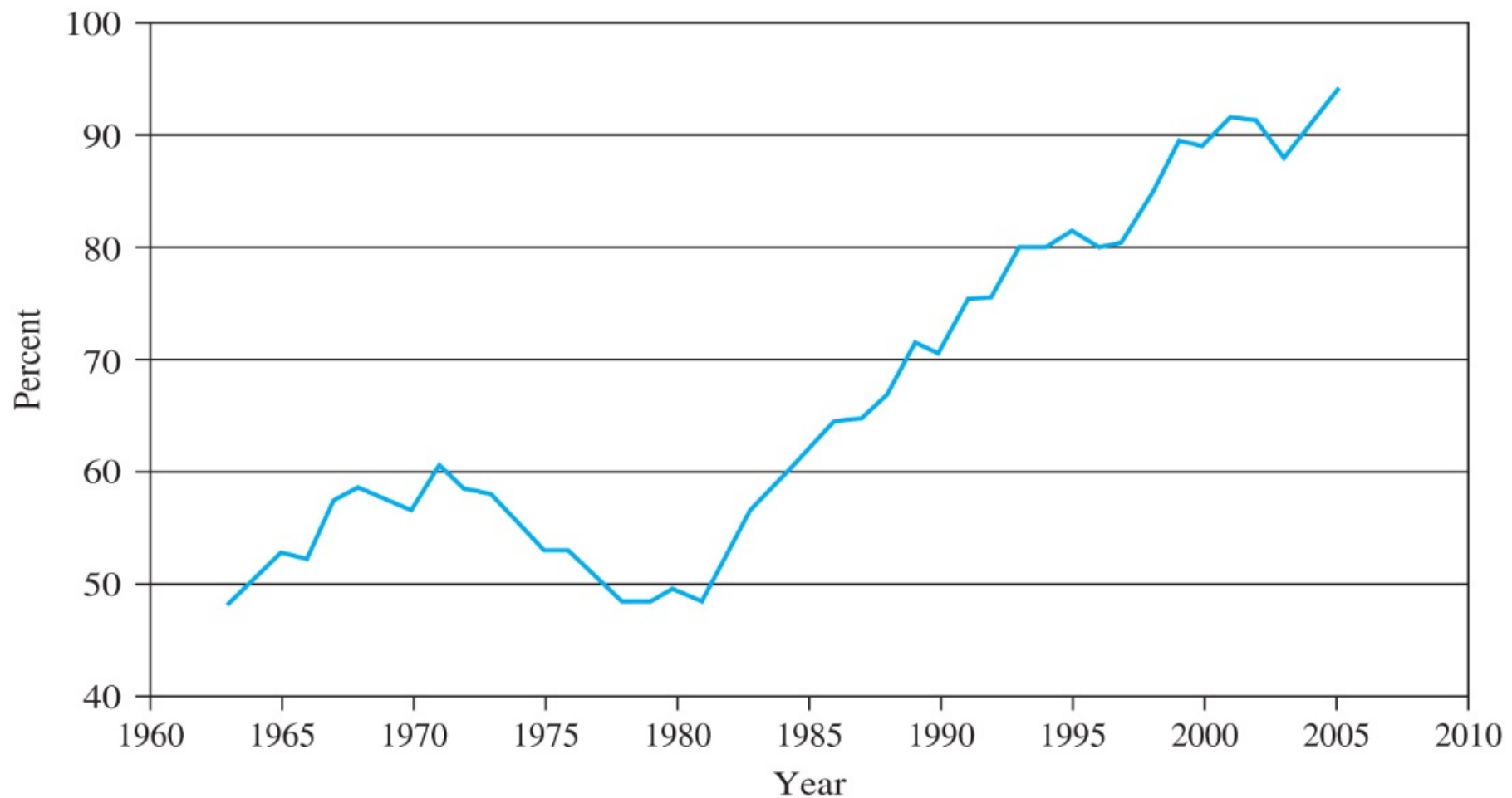
Changes in the Wage Structure: The 1980s

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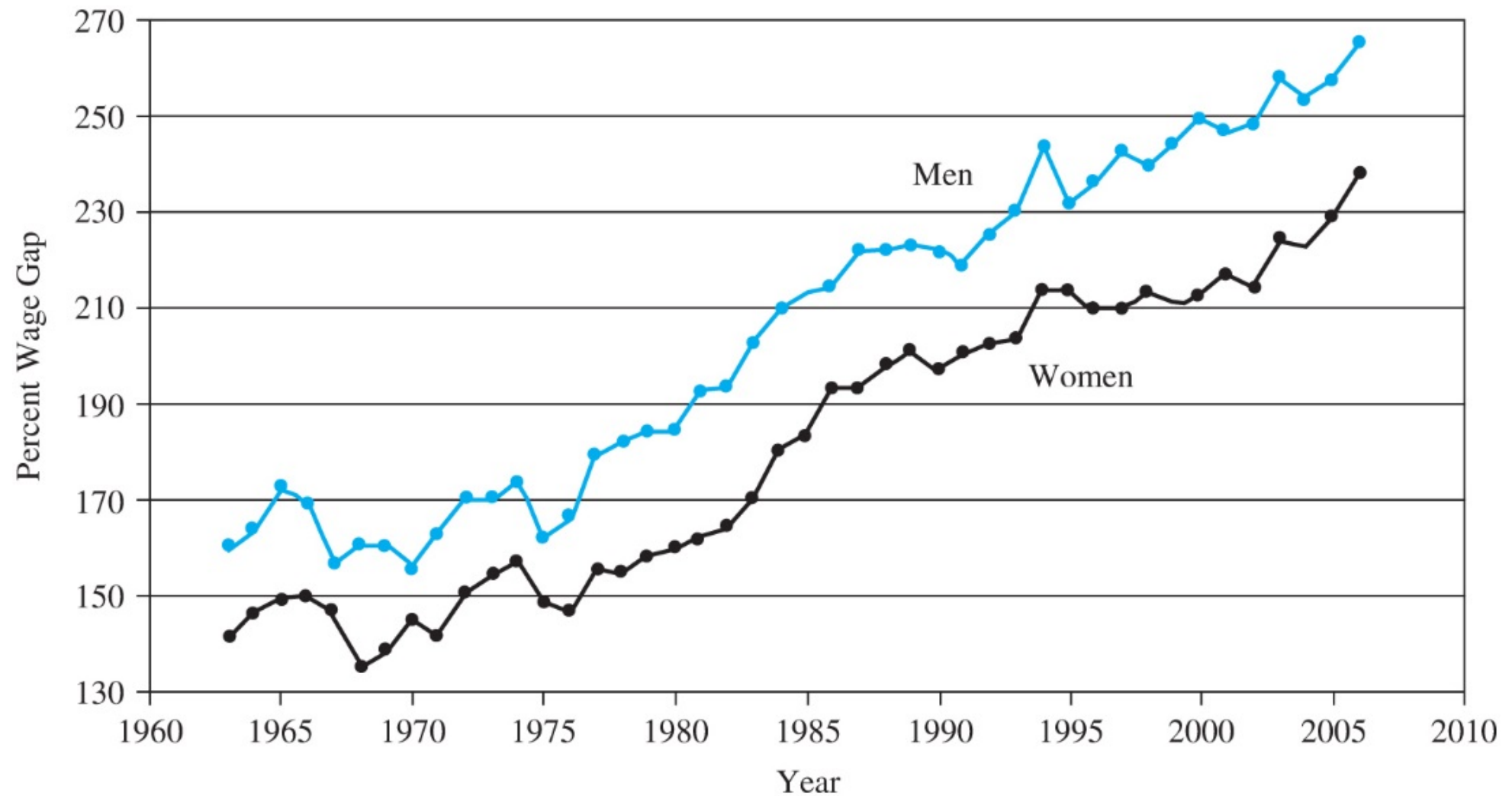
Earnings Inequality for Full-Time, Year-Round Workers, 1937-2005: The Gini Coefficient



Earnings Inequality for Full-Time, Year-Round Workers, 1963-2005: The College Wage Differential



Earnings Inequality for Full-Time, Year-Round Workers, 1963-2005: The 90-10 Wage Gap



The Dispersion of Earnings by Gender, Ages 25-64, 1980-2005

Earnings at			
	80th Percentile (a)	20th Percentile (b)	Ratio: (a) ÷ (b)
Men			
1980	67,499	21,948	3.08
1990	67,533	19,204	3.52
2005	70,952	20,780	3.41
Women			
1980	36,024	9,729	3.70
1990	40,826	8,885	4.60
2005	48,012	12,177	3.94

Sources: U.S. Bureau of the Census, *Money Incomes of Households, Families, and Persons in the United States*, Series P-60: no. 132 (1980), Table 54; no. 174 (1990), Table 29; and U.S. Bureau of the Census, http://pubdb3.census.gov/macro/032006/perinc/new03_000.htm (2005).

Earnings Ratios at Various Percentiles of the Earnings Distribution

Ratio of Earnings at Given Percentiles	1980	1990	2005
<i>Men</i>			
80:20 (see Table 15.1)	3.08	3.52	3.41
80:50	1.53	1.74	1.77
50:20	2.01	2.03	1.93
<i>Women</i>			
80:20 (see Table 15.1)	3.70	4.60	3.94
80:50	1.66	1.79	1.78
50:20	2.24	2.57	2.22
<i>Men</i>			
90:10	4.68	7.31	7.97
90:50	1.87	2.14	2.49
50:10	2.50	3.41	3.20
<i>Women</i>			
90:10	9.12	13.88	9.74
90:50	2.07	2.27	2.34
50:10	4.41	6.12	4.16

Sources: U.S. Bureau of the Census, *Money Incomes of Households, Families, and Persons in the United States*, Series P-60: no. 132 (1980), Table 54; no. 174 (1990), Table 29; and U.S. Bureau of the Census, http://pubdb3.census.gov/macro/032006/perinc/new03_000.htm (2005).

Mean Earnings and the Returns to Education among Full-Time, Year-Round Workers Between the Ages of 35 and 44

	Earnings				Earnings Ratios		
	Dropout	H.S. Grad	Bachelor's	Grad School ^a	H.S./ Drop	Bachelor's/ H.S.	Grad/ Bachelor's
Men							
1980	\$34,807	\$48,564	\$68,433	\$78,175	1.40	1.41	1.14
1990	30,626	43,245	70,830	87,477	1.41	1.64	1.24
2005	29,262	42,133	80,418	110,320	1.44	1.91	1.37
Women							
1980	\$21,535	\$27,837	\$37,922	\$44,312	1.29	1.36	1.17
1990	21,447	29,715	47,265	56,183	1.39	1.58	1.19
2005	20,245	29,301	54,323	71,036	1.45	1.85	1.31

^aThe data for 2005 are a weighted average of earnings for those with various levels of graduate degrees; data for 1980 and 1990 are for those who completed more than four years of college.

Sources: U.S. Bureau of the Census, *Money Income of Households, Families, and Persons in the United States*, Series P-60: no. 132 (1980), Table 52; no. 174 (1990), Table 30; and U.S. Bureau of the Census website: http://pubdb3.census.gov/macro/032006/perinc/new03_190.htm and http://pubdb3.census.gov/macro/032006/perinc/new03_316.htm (2005).

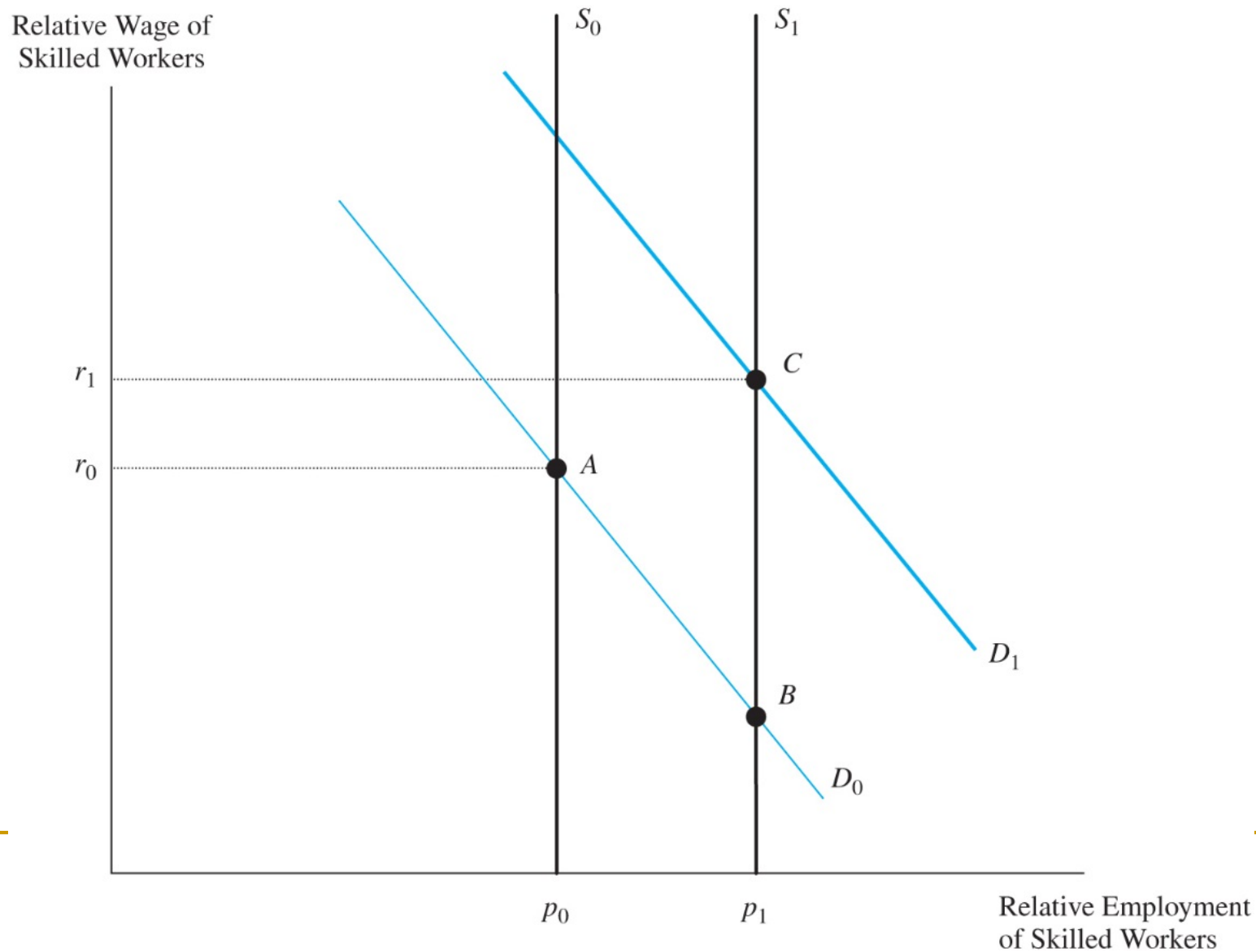
Why Did Wage Inequality Increase?

- No single factor explains the changes.
 - The increase in inequality seems to be caused by concurrent changes in economic “fundamentals” and labor market institutions.
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Why did wage inequality increase?

- Supply shifts
 - Changes in supply: slowdown in the rate of growth of relative skill + increase in unskilled immigration
 - Institutional Changes
 - Decline in unionization
 - Erosion of real value of minimum wage
 - Skill biased technological change
 - International Trade
-

Changes in the wage structure resulting from shifts in supply and demand



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- The competitive labor market then attains equilibrium at point A
 - Two ways in which changes in the underlying economic condition could have increased the wage gap between skilled and unskilled workers
 - Supply curve shift to the left – indicating **a reduction in the relative number of skilled workers**, hence, driving up their relative wage
 - Demand curve shift to the right – indicating **a relative increase in the demand for skilled workers**, and driving up their relative wage
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Educational Composition of the Workforce

(Percent Distribution of Workers by Education)

Source: David H. Autor, Lawrence F. Katz, and Alan B. Krueger, "Computing Inequality: How Computers Changed the Labor Market," *Quarterly Journal of Economics* 113 (November 1998): 1169–213, Table 1.

Year	High School Dropouts	High School Graduates	Some College	College Graduates
1960	49.5%	27.7%	12.2%	10.6%
1970	35.9	34.7	15.6	13.8
1980	19.1	38.0	22.0	20.9
1990	12.7	36.2	25.1	26.1
1996	9.4	33.4	28.9	28.3

The Earnings of Superstars

- Superstar phenomenon – a few persons in some professions earn very high salaries and seem to dominate their field.
 - This suggests that even if a job is the same, different people bring different skills to the same job.
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Superstar Earnings

Rank	Name	2006 Income (in millions)
1	Oprah Winfrey	\$260
2	Jerry Bruckheimer	\$120
3	Steven Spielberg	\$110
4	Tiger Woods	\$100
5	Johnny Depp	\$92
6	Rolling Stones	\$88
7	Jay-Z	\$83
8	Tom Hanks	\$74
9	Madonna	\$72
10	Howard Stern	\$70
10	Brian Grazer & Ron Howard	\$70

Why Did Wage Inequality Increase?

Supply shifts.

International trade.

Skill-based technological change.

Institutional changes in the U.S. labor market.

- Unions
- Minimum Wage

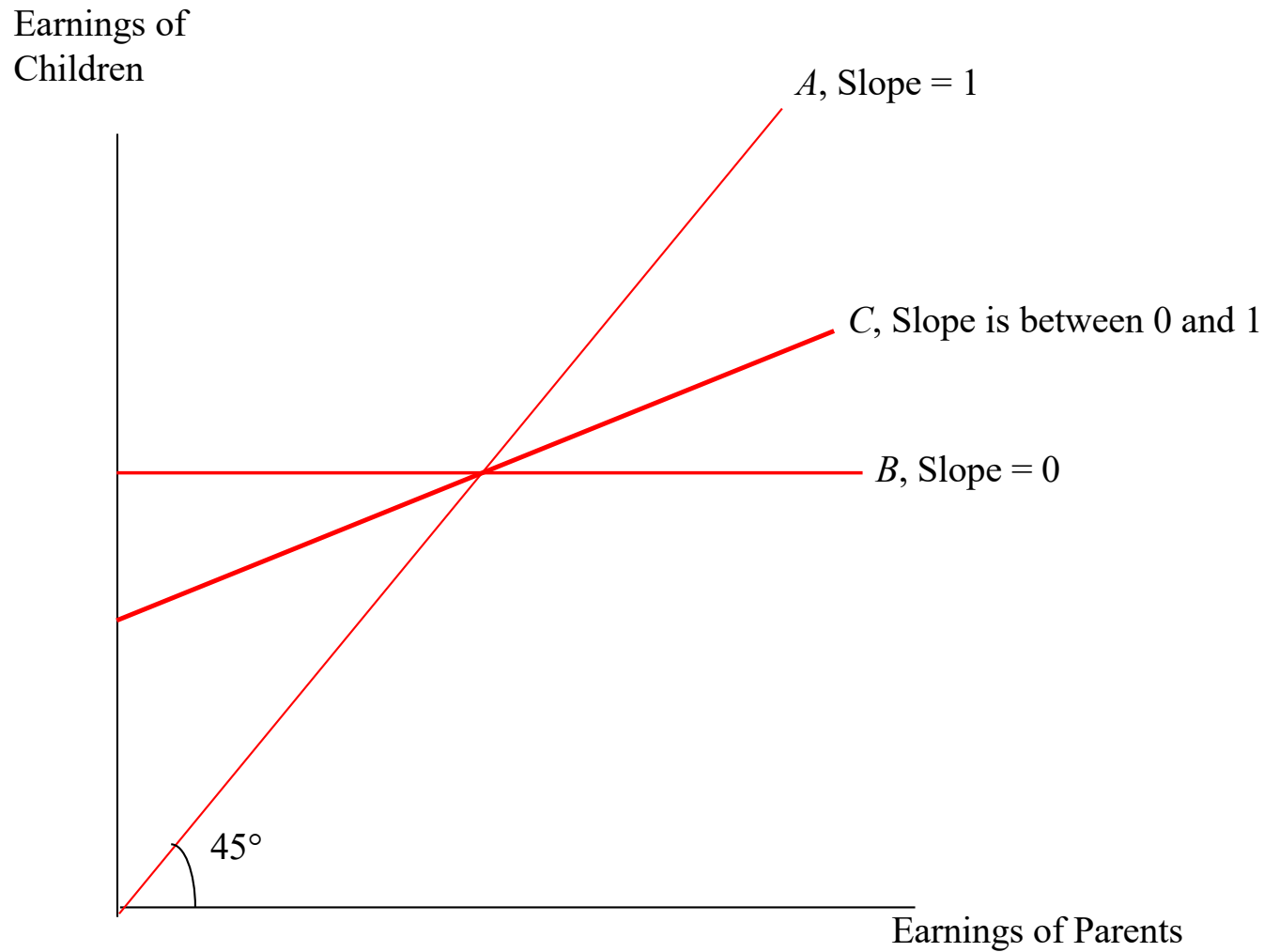
Inequality Across Generations

- There is a positive correlation between the skills of parents and their children.
 - High-income parents typically invest more in the education of their children than do low-income parents.
 - There is a tendency for income differences across families to get smaller over time (“regression toward the mean”).
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Inequality across generation

- Social Mobility
 - Intergeneration correlation → earning of children and earning of parent
 - Factors:
 - Innate ability
 - Opportunity for education
 - Family background
-

The intergenerational link in skills



Intergenerational correlation

- ❑ The slope of the regression line linking the earnings of the children and the earnings of the parents
 - ❑ Slope =1 the wage gap between any two parents persists entirely into the next generation and there is no regression toward the mean
 - ❑ Slope=0 the wage of children is independent of the wage of the parents and there is complete regression toward the mean
-

Social Capital

- The quality of the environment where a child grows up helps determine human capital.
 - There is evidence that varied factors influence a child's level of human capital.
 - Quality of neighborhood.
 - Importance of religious organizations.
 - Socioeconomic background of classmates.
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