

# *Master in Economics*

## Labour economics – Lecture 9

March 2025



# Lecture 9

## Topics

- **Inequality in earnings**
  - Measuring Inequality
  - Earnings Inequality Since 1980: Some Descriptive Data
  - The Underlying Causes of Growing Inequality

## Bibliography:

- Ehrenberg, Ronald & Robert Smith, *Modern Labor Economics: Theory and Public Policy* – Chapter 14

# Inequality in Earnings

# Inequality in Earnings

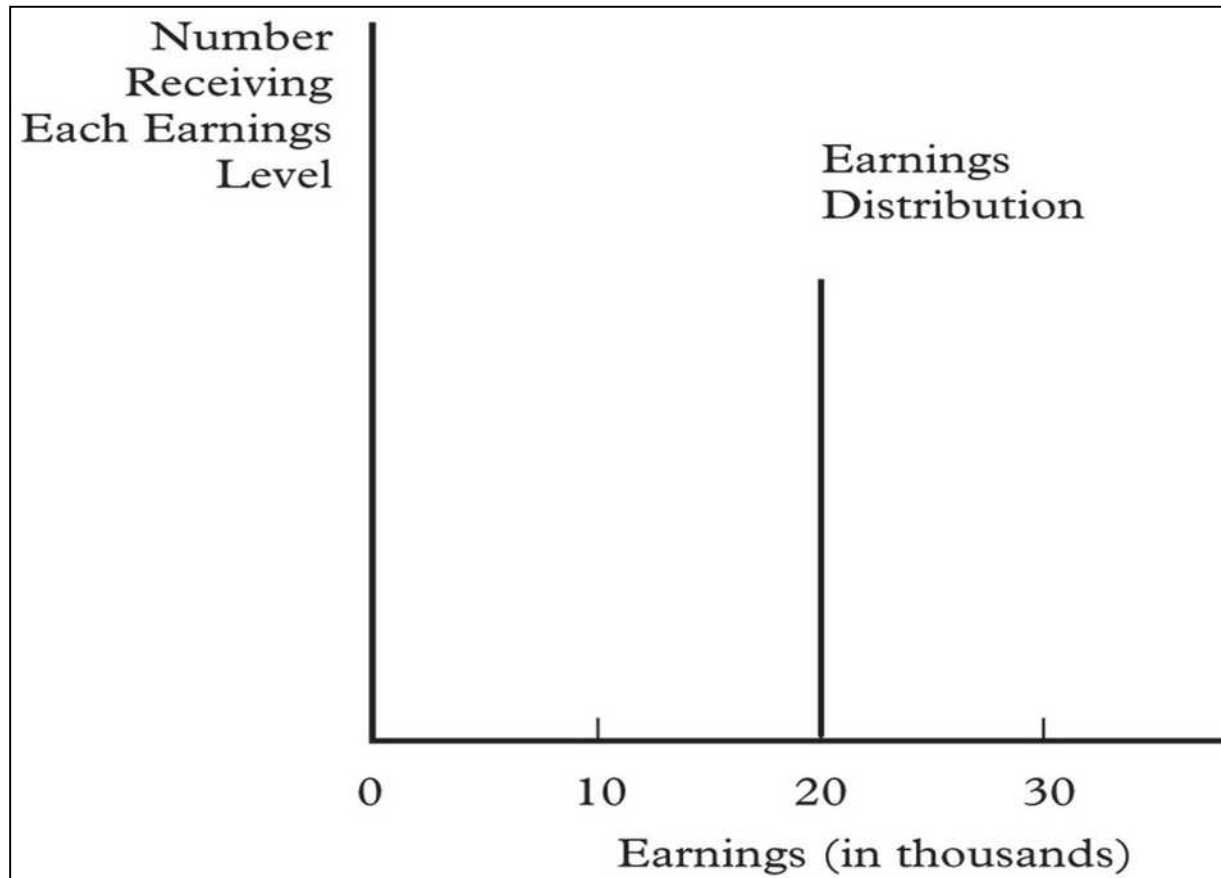
- **Societies concerned with both the level and the dispersion of income in the economy**
  - concerns about the level: stem from income being an important determinant of the consumption
  - concerns about the distribution: stem from the importance that the individuals place on their relative standing in society and the importance that the society places on equity
- **Distribution of family incomes is of interest for purposes of assessing issues of poverty and relative consumption opportunities**
  - whether to consider unearned as well as earned income
  - deal with family size and how families are defined, formed, and dissolved

# Inequality in Earnings

- **Focus on the distribution of earnings**
  - only part of overall income
  - earnings are a reflection of
    - marginal productivity
    - investment in (and returns to) education, training, and migration activities
    - access to opportunities

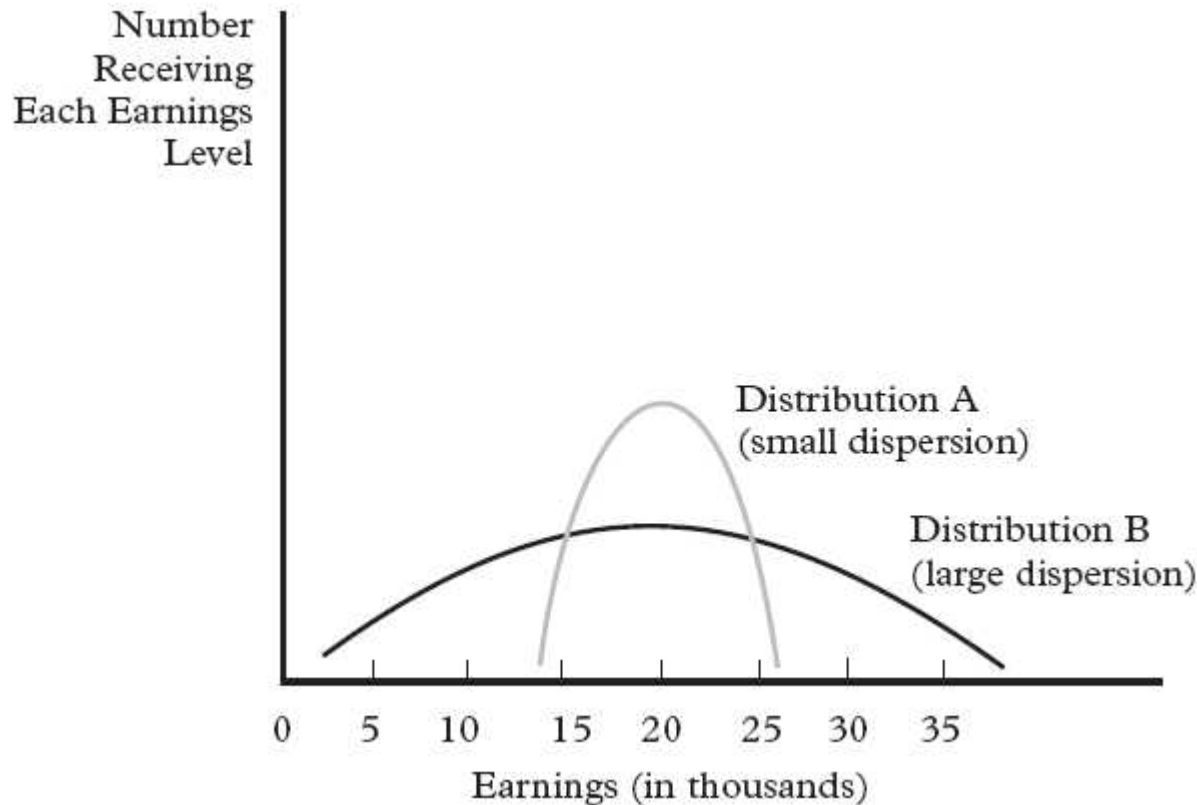
# Measuring Inequality

- **Earnings Distribution with Perfect Equality**



# Measuring Inequality

- **Distributions of Earnings with Different Degrees of Dispersion**



Distribution A shows small dispersion around the mean/average income of \$20,000

Distribution B shows large dispersion around the mean/average income of \$20,000

# Measuring Inequality

- **Measures of inequality**

- variance
  - problem: rises as earnings grow
  - better measure of the absolute than of the relative dispersion of earnings
- coefficient of variation: std. deviation/mean
- shares ratio:
  - ratio of shares of total earnings received by some percentiles - eg: comparing shares of total income received by the top and bottom fifth (or “quintiles”) of households in the population
- ratio of earnings
  - ratio of earnings received by some percentiles - eg: compare earnings at the 80<sup>th</sup> percentile to earnings at the 20<sup>th</sup>
- Gini index and Lorenz curves

# Earnings Inequality Since 1980

Table 15.1 The Dispersion of Earnings by Gender, Ages 25–64, 1980–2018 (Expressed in 2018 Dollars)

	Earnings at		
	80th percentile (a)	20th percentile (b)	Ratio: (a)/(b)
<b>Men</b>			
1980	87,122	28,329	3.08
1990	87,166	24,787	3.52
2005	91,580	26,822	3.41
2018	95,883	27,443	3.49
<b>Women</b>			
1980	46,498	12,558	3.70
1990	52,696	11,468	4.60
2005	61,971	15,718	3.94
2018	70,000	19,999	3.50

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; U.S. Bureau of the Census, [http://pubdb3.census.gov/macro/032006/perinc/new03\\_000.htm](http://pubdb3.census.gov/macro/032006/perinc/new03_000.htm) (2005), [www.census.gov/data/tables/time-series/demo/income-poverty/cps-pinc/pinc-03.html](http://www.census.gov/data/tables/time-series/demo/income-poverty/cps-pinc/pinc-03.html) (2018)

# Earnings Inequality Since 1980

Table 15.2 Earnings Ratios at Various Percentiles of the Earnings Distribution—1980, 1990, 2005, 2018

Ratio of earnings at given percentiles	1980	1990	2005	2018
<b>Men</b>				
80:20 (see <a href="#">Table 15.1</a> )	3.08	3.52	3.41	3.49
80:50	1.53	1.74	1.77	1.85
50:20	2.01	2.03	1.93	1.89
<b>Women</b>				
80:20 (see <a href="#">Table 15.1</a> )	3.70	4.60	3.94	3.50
80:50	1.66	1.79	1.78	1.83
50:20	2.24	2.57	2.22	1.91
<b>Men</b>				
90:10	4.68	7.31	7.97	*
90:50	1.87	2.14	2.49	*
50:10	2.50	3.41	3.20	2.70
<b>Women</b>				
90:10	9.12	13.88	9.74	8.47
90:50	2.07	2.27	2.34	2.45
50:10	4.41	6.12	4.16	3.45

\*Because published earnings at the 90th percentile fell into an “open” range (“\$100,000 and above”), we could not observe earnings at this percentile.

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; U.S. Bureau of the Census,

[http://pubdb3.census.gov/macro/032006/perinc/new03\\_000.htm](http://pubdb3.census.gov/macro/032006/perinc/new03_000.htm) (2005), [www.census.gov/data/tables/time-series/demo/income-poverty/cps-pinc/pinc-03.html](http://www.census.gov/data/tables/time-series/demo/income-poverty/cps-pinc/pinc-03.html) (2018)

# Earnings Inequality Since 1980

Country	90:10 Ratios in 2018
Sweden	2.14
Norway	2.51
Japan	2.82
Netherlands	3.02 (for 2014)
Australia	3.13
Germany	3.33
Canada	3.42
United Kingdom	3.42
United States	4.95

# Earnings Inequality Since 1980

- **Summary**

- unambiguous increase in inequality during the 1980s, with earnings in both the upper and lower halves of the earnings distribution becoming more dispersed
- especially pronounced fall in relative earnings at the very bottom of the distribution (lowest 10th percentile) during the 1980s - downward pressures on the earnings of the lowest-skilled workers
- since 1990 earnings have become less dispersed in the lower half of the earnings distribution - earnings at the bottom have increased relative to the median (at least prior to the recession that started to take hold in 2008)
- since 1990 earnings at the 90th percentile have pulled farther away from the median than have earnings at the 80th percentile — continued increases in relative earnings at the very top of the earnings distribution

# Income Inequality in Portugal

Figure 14. Indicators on income inequality, Portugal, 2017-2023

	unit	2017	2018	2019	2020	2021	2022	2023
Gini Coefficient (%)	%	32.1	31.9	31.2	33.0	32.0	33.7	31.9
S80/S20	no.	5.2	5.2	5.0	5.7	5.1	5.6	5.2
S90/S10	no.	8.7	8.6	8.1	9.8	8.5	9.7	8.9

Source: INE, Survey on Income and Living Conditions 2018-2024.

# Income Inequality in Portugal

Figure 15. Some percentiles of net monetary income per adult equivalent, Portugal, 2017-2023



Source: INE, Survey on Income and Living Conditions 2018-2024.

# Income Inequality in Portugal

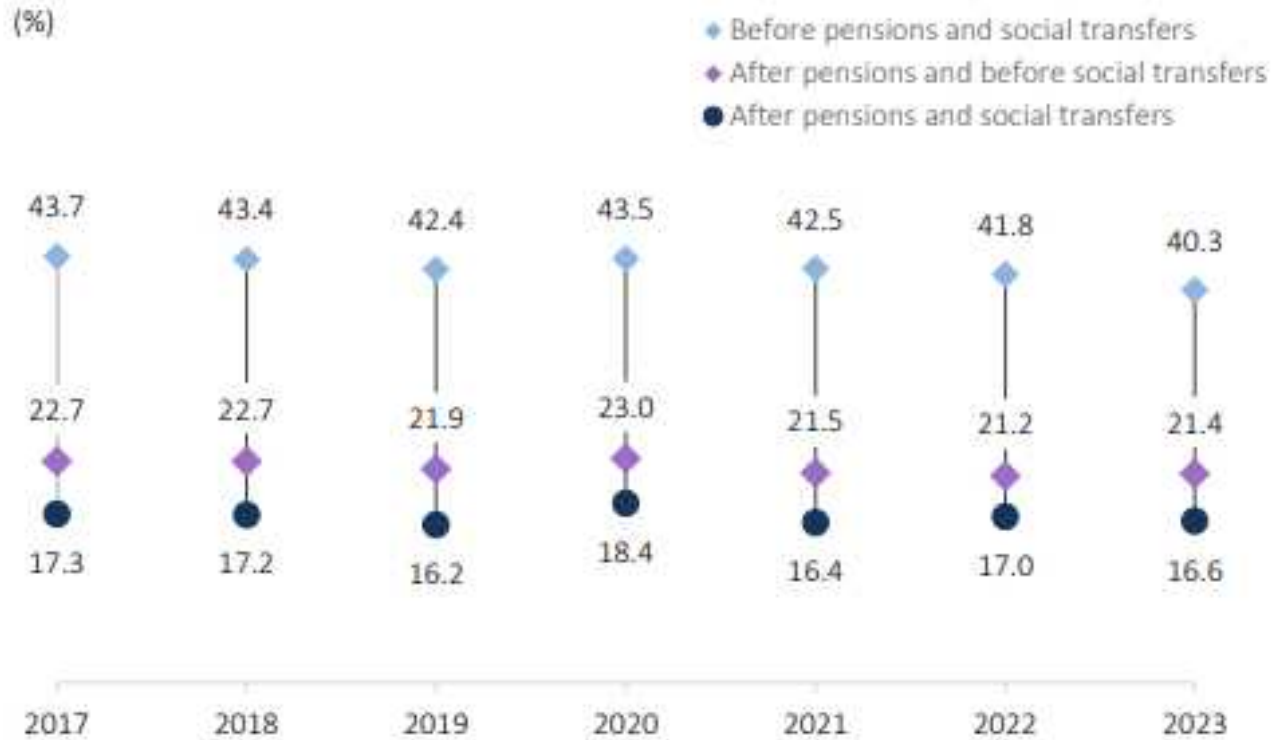
Figure 20. Indicators of material and social deprivation, Portugal, 2018-2024

	2018	2019	2020	2021	2022	2023	2024
Material and social deprivation rate	14.5	13.2	12.7	13.5	11.9	11.9	11.0
Severe material and social deprivation rate	6.6	5.6	5.4	6.0	5.3	4.9	4.3

Source: INE, Survey on Income and Living Conditions 2018-2024.

# Income Inequality in Portugal

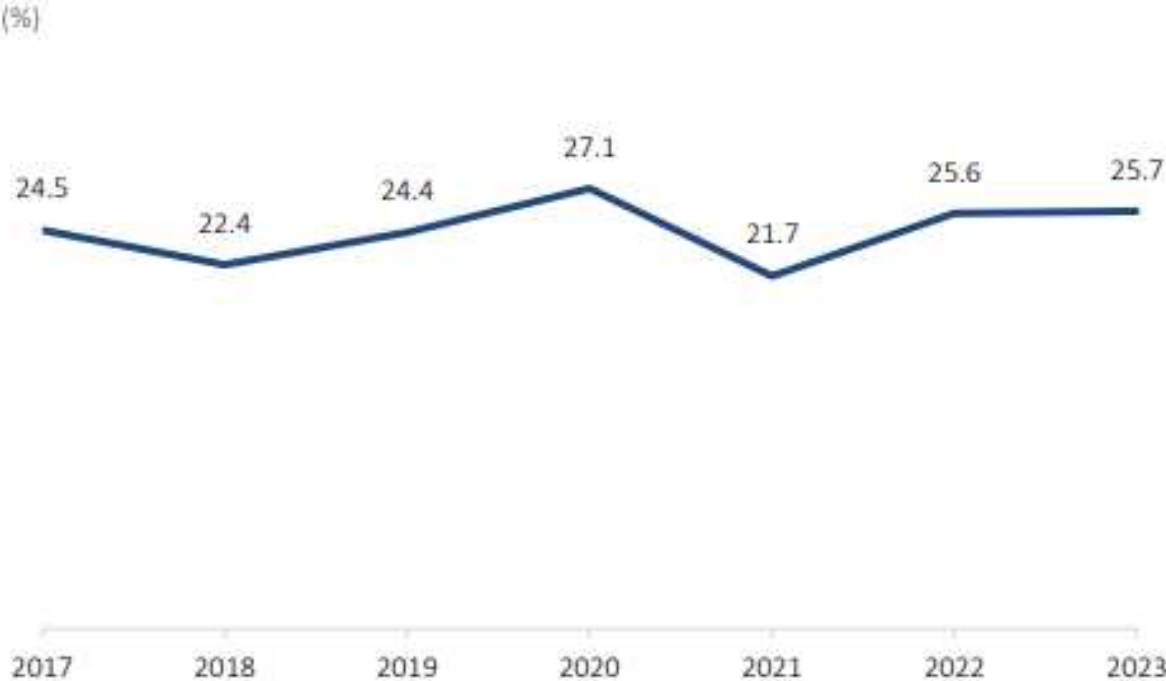
Figure 12. At-risk-of-poverty rate considering social transfers, Portugal, 2017-2023



Source: INE, Survey on Income and Living Conditions 2018-2024.

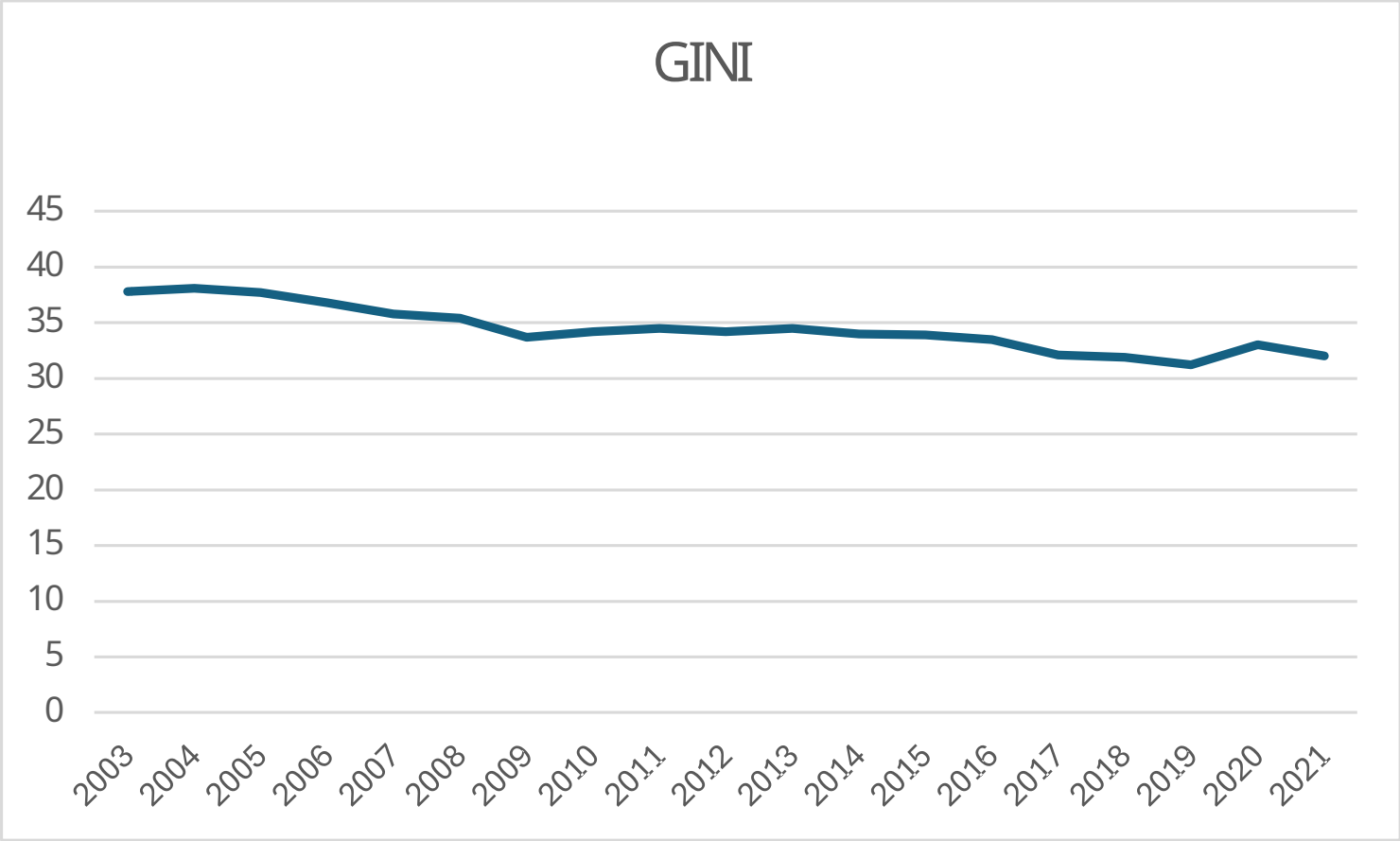
# Income Inequality in Portugal

Figure 13. Relative median at-risk-of-poverty gap (60% of median), Portugal, 2017-2023



Source: INE, Survey on Income and Living Conditions 2018-2024.

# Income Inequality in Portugal



# Earnings Inequality Since 1980

- **Explanations for the changes in the distribution of earnings since 1980**
  - changes in the distribution of earnings since 1980 occurred along two dimensions
    - increased returns to investments in higher education raised the relative earnings of those at the top of the distribution (those with higher levels of human capital)
    - the growth in earnings disparities within human-capital groups, which stretches out the earnings at both the higher and lower ends of the distribution

# Earnings Inequality Since 1980

- The Increased Returns to Higher Education

Table 15.3 Mean Earnings and the Returns to Education among Full-Time, Year-Round Workers, Ages of 35 and 44 (Expressed in 2018 Dollars)

	Earnings				Earnings ratios		
	Dropout (\$)	H.S. grad (\$)	Bachelor's (\$)	Grad school <sup>a</sup> (\$)	H.S./dropout	Bachelor's/H.S.	Grad/bachelor's
<b>Men</b>							
1980	44,910	62,661	88,297	100,866	1.40	1.41	1.14
1990	39,516	55,798	91,389	112,869	1.41	1.64	1.24
2005	37,756	54,363	103,761	142,343	1.44	1.91	1.37
2018	41,453	53,291	97,145	133,085	1.29	1.82	1.37
<b>Women</b>							
1980	27,787	35,916	48,930	57,174	1.29	1.36	1.17
1990	27,673	38,341	60,985	72,491	1.39	1.59	1.19
2005	26,122	37,806	70,091	91,656	1.45	1.85	1.31
2018	26,833	37,667	75,145	98,855	1.40	1.99	1.32

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; U.S. Bureau of the Census website:

[http://pubdb3.census.gov/macro/032006/perinc/new03\\_190.htm](http://pubdb3.census.gov/macro/032006/perinc/new03_190.htm) and

[http://pubdb3.census.gov/macro/032006/perinc/new03\\_316.htm](http://pubdb3.census.gov/macro/032006/perinc/new03_316.htm) (2005), [www.census.gov/data/tables/time-series/demo/income-poverty/cps-pinc/pinc-03.html](http://www.census.gov/data/tables/time-series/demo/income-poverty/cps-pinc/pinc-03.html) (2018)

# Earnings Inequality Since 1980

- **The Increased Returns to Higher Education**
  - the real earnings of men between age 35 and 44 with college or graduate school education have risen since 1980 – particularly among those with graduate degrees – while those with high school education or less have experienced decreases in real earnings
  - the rising returns to investing in bachelor's degrees or a graduate degree are also observed for women, although the underlying changes within each level of education are different

# Earnings Inequality Since 1980

- **Growth of Earnings Dispersion within Human-Capital Groups**
  - earnings within narrowly defined human-capital groups became more diverse
    - if for example, those at the top of the earnings distribution are older workers with college education (and are better paid), while those at the bottom are younger workers who dropped out of high school (unskilled group with lower wages) – the increase of within group diversity increases the overall 80:20 or 90:10 ratios
  - division of men into different groups by age cohorts and education (college and high school) revealed that earnings disparities grew among each human-capital group since the 1980s

# Earnings Inequality Since 1980

- **Growth of Earnings Dispersion within Human-Capital Groups**

Table 15.4 Ratio of Earnings at the 80th to 20th Percentiles for Men Who Work Full Time, by Age and Education, 1994–2018

	1994	2004	2018
Male bachelor's graduates			
Ages 25–34	2.23	2.35	2.32
Ages 35–44	2.67	2.72	*
Ages 45–54	2.57	2.69	*
Male high school graduates			
Ages 25–34	2.52	2.39	2.26
Ages 35–44	2.67	2.40	2.49
Ages 45–54	2.13	2.37	2.43

\*Because published earnings at the top of the earnings distribution fell into an “open” range (\$100,000 and above), earnings at the 80th percentile could not be observed.

Sources: U.S. Bureau of the Census, Current Population Survey Tables for Personal Income, PINC-03:

[www.census.gov/data/tables/time-series/demo/income-poverty/cps-pinc/pinc-03.1994.html](http://www.census.gov/data/tables/time-series/demo/income-poverty/cps-pinc/pinc-03.1994.html) (1994);

[www.census.gov/data/tables/time-series/demo/income-poverty/cps-pinc/pinc-03.2004.html](http://www.census.gov/data/tables/time-series/demo/income-poverty/cps-pinc/pinc-03.2004.html) (2004);

[www.census.gov/data/tables/time-series/demo/income-poverty/cps-pinc/pinc-03.2014.html](http://www.census.gov/data/tables/time-series/demo/income-poverty/cps-pinc/pinc-03.2014.html) (2018)

# The Underlying Causes of Growing Inequality

- **Possible reasons for the widening gap between the wages of highly educated and less-educated workers**
  - the supply of less-educated workers might have risen faster than the supply of college graduates
  - the demand for more-educated workers might have increased relative to the demand for less-educated workers
  - changes in institutional forces (the minimum wage or the decline in unions) might have reduced the relative wages of less-educated workers

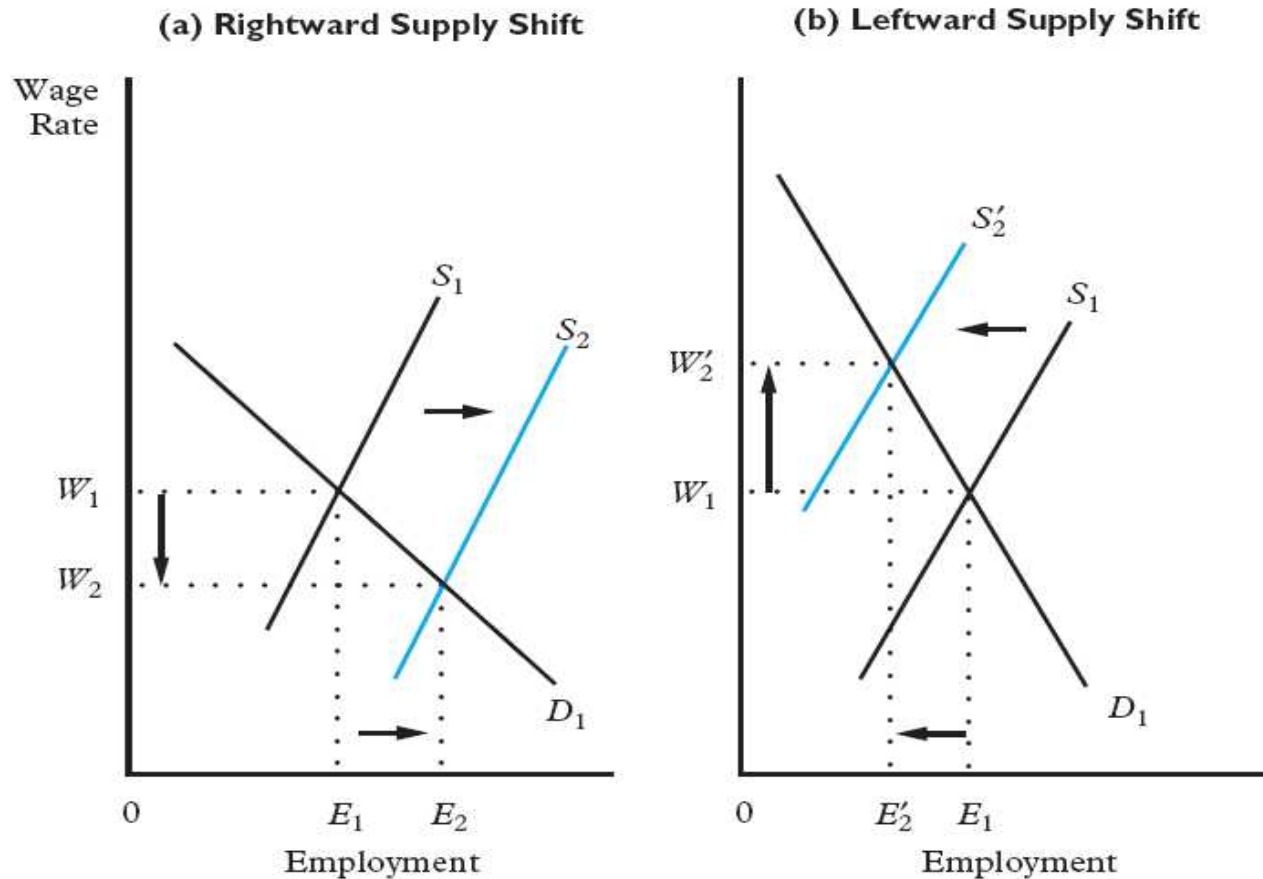
# The Underlying Causes of Growing Inequality

- **Changes in Supply**

- the changes in supply can be the dominant force/cause of the wage changes or the increasing gap in recent years
- if supply shifts are primarily responsible for the increasing gap between the wages of highly educated (skilled) and less-educated workers, we should observe that the employment of unskilled workers increased relative to the employment of the college-educated workforce

# The Underlying Causes of Growing Inequality

- **Changes in Supply**



# The Underlying Causes of Growing Inequality

- Changes in Supply

Table 15.5 Employment Shares (Within Gender) of Educational Groups, Workers 25 and Older—1980, 1990, 2005, 2018

<b>Groups whose relative earnings rose</b>	<b>1980</b>	<b>1990</b>	<b>2005</b>	<b>2018</b>
A. Men with graduate degree (%)	9.1	10.5	11.6	14.2
B. Men with bachelor's degree (%)	11.4	14.0	20.5	24.5
C. Women with graduate degree (%)	5.7	8.2	11.1	17.5
D. Women with bachelor's degree (%)	10.3	13.9	21.8	27.0
<b>Groups whose relative earnings fell</b>				
E. Men with high school degree (%)	38.2	38.1	30.8	27.8
F. Male dropouts (%)	22.7	16.3	11.6	8.3
G. Women with high school degree (%)	46.4	42.1	28.6	22.2
H. Female dropouts (%)	17.8	12.2	7.8	5.3

Sources: U.S. Bureau of the Census, *Money Income of Households, Families, and Individuals in the United States*, Series P-60: no. 132 (1980), Table 52; no. 174 (1990), Table 30; U.S. Bureau of the Census,

[http://pubdb3.census.gov/macro/032006/perinc/new03\\_127.htm](http://pubdb3.census.gov/macro/032006/perinc/new03_127.htm),

[http://pubdb3.census.gov/macro/032006/perinc/new03\\_253.htm](http://pubdb3.census.gov/macro/032006/perinc/new03_253.htm) (2005), and [www.census.gov/data/tables/time-series/demo/income-poverty/pinc-04.html](http://www.census.gov/data/tables/time-series/demo/income-poverty/pinc-04.html) (2018)

# The Underlying Causes of Growing Inequality

- **Changes in Supply**

- shifts in supply cannot be the dominant explanation for the growing returns to education:
  - groups that experienced increases in their relative earnings also experienced more rapid employment growth, and
  - groups whose earnings fell also experienced falling shares of employment
- they might had some effect - immigration to the United States rose during the period – but not the only explanation
  - one study: one-third of the decreased relative wages of high school dropouts was caused by immigration

# The Underlying Causes of Growing Inequality

- **Changes in Demand: Technological Change**
  - shifts in labour demand curves were a prominent factor raising inequality since 1980
  - data: rightward shift in the demand for workers with a university education and a leftward shift in the demand for workers with a high school education or less
  - skill-biased technological change - technological change that increased the productivity of highly skilled workers and reduced the need for low-skilled workers
    - *capital and skilled labour tend to be gross complements; capital and unskilled labour are likely to be gross substitutes*

# The Underlying Causes of Growing Inequality

- **Changes in Demand: Technological Change**
  - abrupt need to learn new skills, combined with differential learning costs across workers, generated two sources of greater inequality:
    - **Across**: those with lower learning costs are likely to invest more in education: workers with more schooling were the ones who adapted more quickly to the new, high-tech environment
    - **Within**: even within human-capital groups, the psychic costs of learning cause some workers to be more resistant to change than others; as some adapt more quickly and completely than others, it is quite likely that earnings disparities within human-capital groups will grow

# The Underlying Causes of Growing Inequality

- **Changes in Demand: Technological Change**

- high-tech revolution: effects on the demand for labour that were more complex than simply increasing the demand for skilled workers
  - computerized technologies were readily substituted for labour in routine processes
  - computers **cannot** replace the abstract and interpersonal skills used by the highly educated—nor can they replace the non-routine manual skills used in many very low-skilled jobs
- computerization had a **polarizing effect** on job growth
  - reduced the demand for many factory and clerical workers
  - increased the demand for both the highly educated **and** (through the scale effect) those in non-routine manual jobs
- increased demand for jobs at the lower end of the earnings distribution played a role in **reducing inequality in the lower half of the earnings distribution** in recent years

# The Underlying Causes of Growing Inequality

- **Changes in Demand: Technological Change: evidence of polarization**

Table 15.6 Changes in the Share of Employment for Four Major Occupational Groups, 1983–2018

Occupational group (2015 weekly earnings)	Share in total employment		
	1983 (%)	2000 (%)	2018 (%)
Managers (\$1,355)	10.7	15.1	16.6
Professionals (\$1,176)	12.7	15.6	23.5
Office and administrative support (\$717)	16.3	14.2	11.3
Service (\$569)	13.7	13.9	17.2

Sources: U.S. Bureau of Labor Statistics, *Employment and Earnings* 31 (January 1984), Table 20 (1983); 48 (January 1991), Table 23 (2000); and U.S. Bureau of Labor Statistics, “2018 Annual Averages—Household Data—Tables from Employment and Earnings,” Tables 9 and 39, at [bls.gov/cps/cps\\_aa2018.htm](https://bls.gov/cps/cps_aa2018.htm)

- share of workers who are managers or professionals, or service workers increased while the share of workers in office and administrative support jobs declined
- technological change has had a polarizing effect on employment

# The Underlying Causes of Growing Inequality

- **Changes in Demand: Earnings instability**

- technological developments (coupled with growing competition within product markets through deregulation and the globalization of production) have led to a growth in the **instability of earnings for individual workers**
- in periods of rapid change, some firms grow while others die, and some workers work overtime while others are laid off – any growth in the **instability of individual earnings could also have contributed to the growth of earnings inequality**

a recent study has found evidence that the degree of earnings instability is higher now than in 1980, particularly in the lower end of the earnings distribution

# The Underlying Causes of Growing Inequality

- **Changes in Institutional Forces**
- **two other causes of growing earnings inequality:**
  - **decline in unions** - could have caused the increase in the 80:50 or 90:50 ratios - unionized workers tended to have earnings in the middle of the distribution
  - **minimum wage** - remained constant over much of the period since 1980, while wages in general rose, thus falling real minimum wage - increase the 50:20 or 50:10 ratios

# The Underlying Causes of Growing Inequality

- **Changes in Institutional Forces: Unions**
  - a priori reasons to doubt that the decline of labour unions has been a significant causal factor of the increased returns to education after 1980
    - the declining share of unionized workers in the United States is a phenomenon that started in the 1950s
    - women are less highly unionized than men, and the fall in their rates of unionization has been considerably smaller, yet increases in the returns to education were as large among women as among men, or larger, after 1980
  - **Studies:** effects of declining unionization on wage inequality conclude that it explains perhaps 20% of the growth in inequality for men (but not women) in the 1980s, but played no important role after 1990

# The Underlying Causes of Growing Inequality

- **Changes in Institutional Forces: Minimum wage**
  - **1981:** the minimum wage was set at a value that was 45% of the average wage for nonsupervisory workers in manufacturing
    - the nominal minimum wage was held constant throughout the rest of the 1980s - the legal minimum had fallen to about one-third of the average wage by the time it was again increased in the early 1990s
  - the increasing equality in the lower half of the earnings distribution and the relative wage growth in the very upper tail suggest that declines in the real minimum wage— which were once again marked after 1997—did not play much of a role after 1990