

Income and Wage Inequality

A. Introduction

1. We have considered (and will consider) why there might be variation in labor supply and wage outcomes
 - a. variation in hours: from our previous models, differences in labor supply result from differences in preferences, wages, non-labor incomes, family structure, non-market production opportunities, etc.
 - b. variation in wages:
 - 1) we have also talked about differences in skills (more specifically, human capital) contributing to differences in wages
 - 2) in future lectures, we will discuss other reasons for differences in wages such as compensating differentials and discrimination
 - c. variation in hours and wages leads to variation in earnings and incomes
2. Given that we have already examined these issues, what motivates any additional inquiry into inequality?
 - a. concern for fairness – people (including economists) may prefer relatively equal distributions
 - b. concern for people at the bottom of the wage and income distributions (the poor)
 - c. want to explain trends – why does inequality in a society increase or decrease over time; specifically, for the U.S. want to examine why
 - 1) inequality has increased since the 1970s

2) absolute outcomes for people at the bottom of the distribution have gotten worse

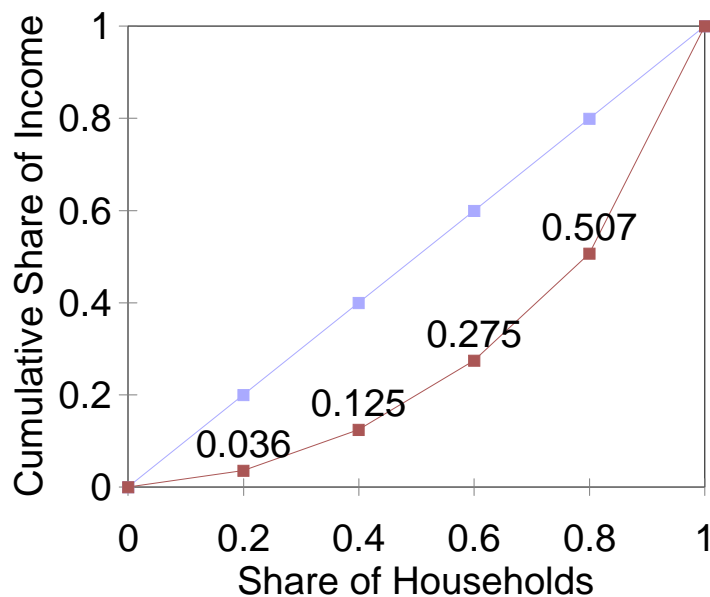
B. How do we measure income inequality?

1. The Lorenz Curve

- a. orders households (or individuals) in order of income
- b. then captures the cumulative share of income received by each share of the population
- c. if incomes are all equal, the curve is a 45° line
- d. if incomes are not equal, the curve is convex
- e. the farther the curve is from the 45° line, the greater the degree of income inequality
- f. Lorenz curve for 1997 household incomes in U.S. is shown on right (Census Bureau, 1998)

g. picture is good but would like a summary statistic

Lorenz Curve -- Household Income 1997



2. Gini Coefficient

- a. calculated as the ratio of
 - 1) the difference between the area under the Lorenz Curve under perfect income equality (.5) and the actual Lorenz curve, and
 - 2) the area under the Lorenz Curve under perfect income equality
- b. the formula is

$$\text{Gini Coefficient} = \frac{.5 - \text{area under Lorenz Curve}}{.5}$$

3. Variance of the natural log of income

- a. variance is a standard measure of dispersion
- b. measure is sensitive to the units used (e.g., might not be comparable over time or across countries)
- c. not necessarily a good measure for skewed distributions

4. Coefficient of variation of income

- a. defined as the ratio of
 - 1) the standard deviation of the distribution
 - 2) and the mean of the distribution
- b. provides a way of scaling the standard deviation (variance)

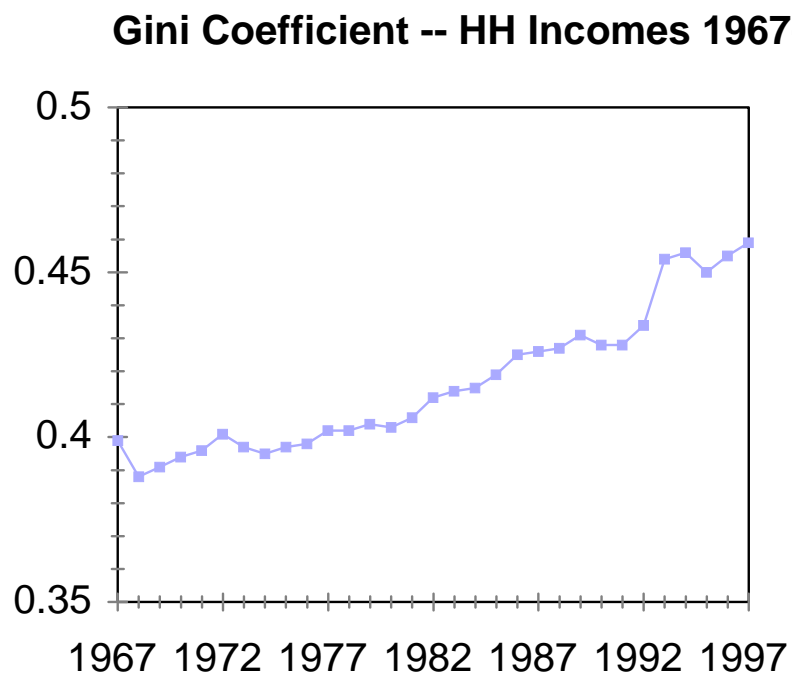
5. Ratios of incomes at different points of the distribution

- a. for example, could compare incomes of the households in the 90th and 10th percentiles of the distribution or 75th and 25th percentiles

- b. useful when working with top-coded data or data with some unreasonably low values (extreme outliers)
- 6. All of these are sensible distributional measures, but...
 - a. they capture different points or different features of the distribution
 - b. because of this, conclusions regarding trends and patterns in income inequality may be sensitive to alternative measures

C. Trends in income inequality over time

- 1. Trends in the Gini Coefficient for household money income from 1967-97 are shown below (U.S. Census Bureau 1998)

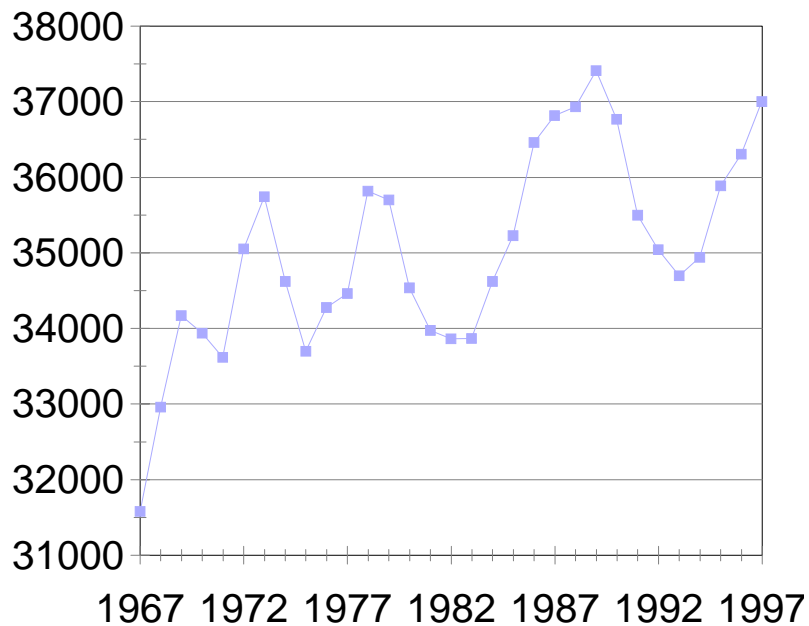


- 2. Note: the survey methodology of the CPS changed in

1993 (spike in 1993-4 is an artifact of that change)

3. By most measures income inequality has risen since the late 1970s
4. rise in inequality has been accompanied by slow growth in incomes (see graph below)

Median Household Income 1967-97



5. households at the lower end of the income scale have been growing poorer in both relative and absolute terms
6. Levy and Murnane (1992) divide recent income and inequality trends into three distinct periods
 - a. 1970-1982
 - 1) some increase in overall inequality; however, little concern because of rising income levels and falling poverty rates
 - 2) some concern about the decrease in the returns to

schooling and increase in the returns to experience

- b. 1983-1987
 - 1) large increase in inequality
 - 2) slow real wage growth
 - 3) tax cuts and reductions in redistribution further focused attention on inequality
 - 4) concerns about de-industrialization (switch from manufacturing to service jobs), loss of “middle class jobs”
 - c. after 1987
 - 1) continued increases in inequality
 - 2) increasing returns to education and experience
 - 3) more sophisticated studies that begin to look at why the demand for skills may have changed and why within group inequality increased
7. Katz and Autor (1999) examine wage inequality; find similar patterns (see their Figure 3)
- a. 1963-1971
 - 1) strong wage growth for men and women
 - 2) little change in inequality
 - b. 1971-1979
 - 1) little wage growth
 - 2) small increase in inequality for men
 - c. 1979-1987
 - 1) men–little wage growth; women–some growth
 - 2) large increase in inequality for men and women

d. 1987-1995

- 1) slight wage growth for women, slight declines for men
- 2) modest increase in inequality for both sexes

D. Other changes in earnings inequality

1. Black/white – between group

a. men:

- 1) narrowing of gap during the late 1960s
- 2) relatively little change over the 1970s and 1980s
- 3) continued narrowing during the 1990s

b. women:

- 1) gap was much smaller to begin with
- 2) narrowed during the late 1960s
- 3) no change during the 1970s
- 4) widened during the 1980s
- 5) and has begun to narrow again

2. Age (experience) – between group

a. premium associated with age has increased over time

b. much of the increase in the earnings differential is associated with the absolute declines in the earnings of young men

c. there has also been an absolute, albeit smaller, decline for young women

3. Education – between group

a. rate of return to schooling declined during the 1970s

- b. rate of return has subsequently increased
- 4. Within group changes in inequality
 - a. changes in inequality between groups has also been accompanied by changes within groups
 - b. specifically, inequality has increased within groups defined by age, education, and gender since the 1970s
- 5. Differences across countries
 - a. many other countries experienced increases in inequality over the last few decades
 - b. increases in inequality have been especially pronounced, however, in the U.S. and U.K.

E. Explanations

1. Supply shifts

- a. increase in supply of young people during the 1970s as a result of the baby boom
 - 1) may account for the fall in the return to schooling during the 1970s
 - 2) may also account for the initial drop in young workers' wages
 - 3) however, does not explain the continued drop in young workers' wages
- b. increased labor force participation by women
 - 1) may have also increased competition among low experience workers
 - 2) trend is continuing
 - 3) more generally, could consider many types of

“secondary workers” – married mothers, retirees

- c. increases in immigration may have also led to an expansion in the supply of low-skill labor
 - d. in general, supply shifts seem consistent with some of the age and education trends; however, they do not explain the whole story
 - 1) does not explain growing within-group inequality
 - 2) do not explain recent trends
2. Demand shifts
- a. “de-industrialization”
 - 1) the growth in inequality during the late 1970s and early 1980s coincided with large declines in manufacturing employment
 - 2) changes in the relative trade position of the U.S. may have contributed to the decline in manufacturing employment
 - 3) concerns about “good” (middle class) jobs being lost and replaced with “bad,” low-paying jobs
 - 4) there is some evidence that middle class jobs were lost during this period; however, sectoral shifts do not seem to account for a lot of the change
 - 5) in particular, there is evidence of growing inequality within industrial sectors
 - 6) evidence that low-skill workers fared differently than high-skill workers within industries
 - b. technological change
 - 1) one theory is that technological change has

increased the productivity of (and hence demand for) high-skilled labor relative to that for low-skilled labor

- 2) increased computerization is one example of these types of changes
- 3) researchers have found evidence linking computer investment to wage and productivity increases
- 4) unfortunately, some of the increase in inequality predates the widespread increase in computerization

c. outsourcing of production

- 1) may explain decline in demand for some types of manufacturing jobs (e.g., automobiles, textiles)
- 2) more recently, lots of service jobs have begun to be outsourced (e.g., computer programming to Ireland and India, telemarketing to the Caribbean)

3. Institutional changes

a. decline in discriminatory practices

- 1) increased opportunities for women and minorities
- 2) was likely to be more important in the 1960s and 1970s than later

b. decline in the importance and influence of unions

- 1) unions were greatly weakened during the 1980s by losses in membership and bargaining position
- 2) in many instances, unions were forced to accept wage cuts to stem employment losses
- 3) although unions have won some recent battles

(e.g., UPS strike from a few years back), they still are not as strong as they were 20-30 years ago

4) loss of union influence is assumed to mean a loss in middle-class wage opportunities

c. decline in the minimum wage

1) Federal minimum wage fixed at \$3.35 1981-90

2) increased to \$3.80 in 1991 and \$4.25 in 1992

3) increased again to \$4.75 in 1997 and \$5.15 in 1998

4) declines in real value when fixed

5) increases also have not kept pace with inflation (e.g., 1981 wage was worth roughly six and a half 2002 dollars)

6) may have led to real decreases for low-wage and secondary earners

d. deregulation

1) numerous industries – trucking, airlines, railroads, natural gas – were deregulated during the late 1970s and early 1980s

2) prior to deregulation, many of these industries enjoyed above-normal profits (rents) which could be shared with labor

3) increased competitive pressure may have decreased wages and employment

F. Empirical methodology for examining SDI approach

1. SDI approach: Supply-Demand-Institutions

2. Katz and Autor (1999) categorize studies

- a. assume log wage consists of
 - 1) competitive component determined by supply and demand, $\ln w_{ic}$, and
 - 2) “rent” component determined by institutional factors, $\ln \mu_i$
 - 3) $\ln w_i = \ln w_{ic} + \ln \mu_i$
 - b. can distinguish between studies that focus on competitive and rent components
3. Some supply and demand studies
- a. Katz and Murphy (1992)
 - 1) basic supply and demand insight – if demand is stable, increase in labor supply should be accompanied by a fall in wages; more complicated when multiple types of labor are considered
 - 2) use gender, education and experience to define labor inputs
 - 3) examine relationship between changes in supply for these groups and changes in wages
 - 4) expected negative relationship appears in 1970s data but not 1980s data (e.g., wages and supplies of skilled workers increase in 1980s)
 - 5) conclude that demand shifts are necessary to explain wage changes in 1980s
 - b. Juhn, Murphy and Pierce (1993)
 - 1) let log wages follow $\ln w_{it} = \mathbf{X}_{it}\boldsymbol{\beta}_t + u_{it}$ where \mathbf{X}_{it} is a vector of observable characteristics like education and experience

- 2) can interpret β_t as a vector of skills prices; note, that these prices are allowed to vary over time
- 3) JMP estimate log wage equations then decompose wage changes into
 - S changes in observable characteristics (skills)
 - S changes in skill prices (demand)
 - S changes in unobservable components (either unobserved supply and demand factors or institutional factors)
- 4) standard variance decomposition technique; however, they show how to decompose changes in other parts of the income distribution
- 5) examine 1964-88 data on inequality, find that
 - S contribution from unobservable components is large
 - S observed components important in 1964-79
 - S skill price component important in 1979-88
- 6) also examine relationship between weekly and annual earnings (use this to infer relationship with income inequality); find that wage inequality accounts for most of the increase in earnings inequality

References

- Juhn, Chinhui; Kevin Murphy, and Brooks Pierce. "Wage Inequality and the Rise in Returns to Skill," *Journal of Political Economy* 101:3 (June 1993), 410-42.
- Katz, Lawrence, and David Autor. "Changes in the Wage Structure and Earnings Inequality," in *Handbook of Labor Economics* Vol. 3A, ed. by O. Ashenfelter and D. Card. Amsterdam: Elsevier, 1999
- Katz, Lawrence, and Kevin Murphy. "Changes in Relative Wages, 1963-1987: Supply and Demand Factors," *Quarterly Journal of Economics* 107:1 (February 1992), 35-78.
- Levy, Frank, and Richard Murnane. "U.S. Earnings Levels and Earnings Inequality: A Review of Recent Trends," *Journal of Economic Literature* 30:3 (September 1992), 1333-81.
- U.S. Census Bureau. *Money Income in the United States: 1997*. Current Population Report # P60-200. Washington, D.C.: U.S. G.P.O., August 1998.