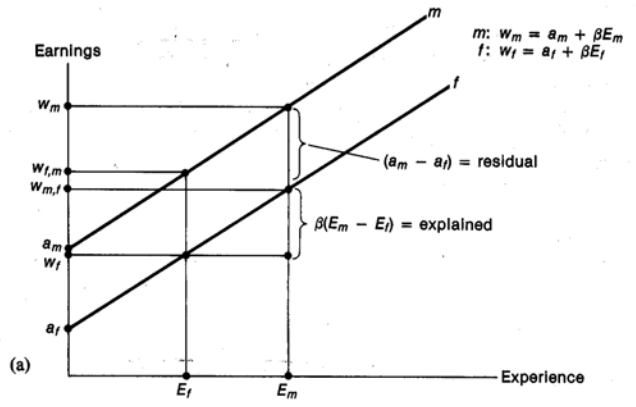
Decomposition of Differences in Means

- ***Regression***: what percent of variation in dependent variable explained by independent variables
- ***Decomposition***: what proportion of gap between two populations explained by independent variables

Decomposition: two explanations

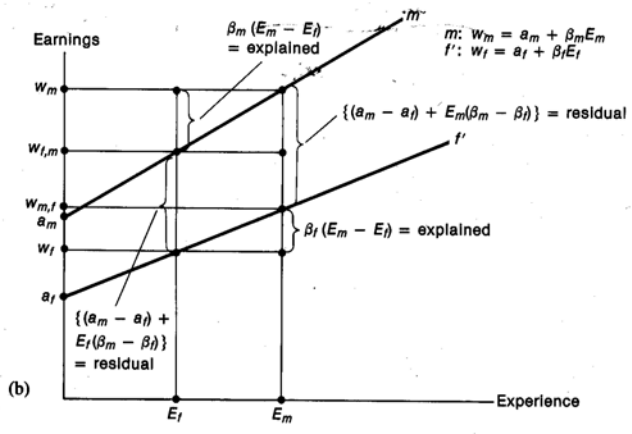
- ***Composition factors*** ("legitimate"): groups differ in their values on the independent variables
- ***Rates of return*** ("illegitimate"): groups differ in rates of return to independent variables
- Estimate by ***regression standardization***

Decomposition:
where two b's are equal



Source: Claudia Goldin. 1990. Understanding the Gender Gap.
New York: Oxford University Press, p. 85.

Decomposition:
where two b's are not equal



Source: Claudia Goldin. 1990. Understanding the Gender Gap.
New York: Oxford University Press, p. 85.

Decomposition:
Jones and Kelley, 1984

1) $\mathbf{a_m - a_f}$: portion unexplained due to group membership
2) $\mathbf{E_m(b_m - b_f)}$, or
   $\mathbf{E_f(b_m - b_f)}$: portion attributed to coefficients
3) $\mathbf{b_m(E_m - E_f)}$, or
   $\mathbf{b_f(E_m - E_f)}$: portion attributed to background factors
4) **Interaction effect**: dollar difference involved in choosing either the male or female as standard

Decomposition:
revisiting two methods

1) $\mathbf{b_m(E_m - E_f)}$: weighting differences in background characteristics by male characteristics

   Jones and Kelley: "Blinder's privilege model," or how much would men's income be reduced if we decreased their background factors to those of women?

Decomposition:
revisiting two methods

2) **$b_f (E_m - E_f)$**: weighting differences in background characteristics by female characteristics

Jones and Kelley: "Deprivation model," or

how much would women's income be increased if we increased their background factors to those of men?

Decomposition:
technical information

Diffs in intercepts

Diffs in slopes

$$(w_m - w_f) = [(a_m - a_f) + \sum X_f (b_m - b_f)] + \sum b_m (X_m - X_f)$$

Diffs in means

Source: Claudia Goldin. 1990. Understanding the Gender Gap. New York: Oxford University Press, p. 86.

Decomposition:
good sources

- I use the decomposition method in Claudia Goldin's, Understanding the Gender Gap, 1990, p. 86
- Other good cites (for these and additional cites, see the course bibliography):

  Duncan, 1968

  Jones and Kelley, 1984

  Roos, 1981

  Roos and Hennessy, 1987

  Wellington, 1994