

Estimation of Wage Discrimination: A Numerical Example

An econometric study estimates the following wage relationships among lab technicians employed by a certain business establishment:

$$W_m = 2.40 + 0.35S + 0.08T + 0.40E$$

$$W_f = 3.01 + 0.25S + 0.03T + 0.35E$$

where W_m and W_f are the hourly compensation rates for males and females, S is years of schooling completed, T is years of work experience with previous employers, and E is years of work experience with the current employer.

The average values of worker characteristics for the company's lab technicians are denoted by the overscored variables given below.

	\bar{W}	\bar{S}	\bar{T}	\bar{E}
males	9.00	12	10	4
females	7.20	13	8	2

Problem

The company's male lab technicians earn on average \$9.00/hr, and its female technicians earn on average \$7.20/hr. How much of the hourly earnings gap of \$1.80/hr can be attributed to differences in qualifications? How much of the earnings gap might be construed as sex discrimination?

Solution

Let W_f^0 denote the predicted average hourly earnings of the female lab technicians if they were compensated according to the same earnings formula as the males:

$$\begin{aligned}W_f^0 &= 2.40 + (0.35)(13) + (0.08)(8) + (0.40)(2) \\ &= \$8.39.\end{aligned}$$

The gap in earnings attributable to measured productivity (qualifications) differences is computed according to

$$\begin{aligned}\bar{W}_m - W_f^0 &= (0.35)(\bar{S}_m - \bar{S}_f) + (0.08)(\bar{T}_m - \bar{T}_f) + (0.40)(\bar{E}_m - \bar{E}_f) \\ &= (0.35)(12 - 13) + (0.08)(10 - 8) + (0.40)(4 - 2) \\ &= \$0.61.\end{aligned}$$

or simply $\bar{W}_m - W_f^0 = \$9.00 - \$8.39 = \$0.61$.

According to these calculations, 61 cents of the \$1.80 hourly earnings gap is attributed to differing qualifications. This leaves a remainder of \$1.19 that could be attributable to wage discrimination. In other words since the female lab technicians actually earn an average of \$7.20/hr, the discrepancy of

$$\begin{aligned}W_f^0 - \bar{W}_f &= \$8.39 - \$7.20 \\ &= \$1.19\end{aligned}$$

is an estimate of the amount of wage discrimination against the female lab technicians.