

WU #6 - Interpreting Coefficients

Math 158 - Jo Hardin

Tuesday 2/8/2022

Name: _____

Names of people you worked with: _____

Consider the following linear model:

$$E[Y] = \beta_0 + \beta_1 \ln(x)$$

1. Does β_1 represent the change in $E[Y]$ for a one unit change in x ?
2. Consider a doubling of x . How does $E[Y]$ change for a doubling of x ? Does your answer depend on the start value of x ?

Solution:

1. No, β_1 does not represent the change in $E[Y]$ for a one unit change in x . That is because a one unit change in x produces different \ln differences depending on the value of x . That is, $\ln(5) - \ln(4) \neq \ln(50) - \ln(49)$.
2. Instead, for a doubling of x (at any value of x !), the change in $E[Y]$ is $\beta_1 \ln(2)$.

$$E[Y | \ln(2x)] - E[Y | \ln(x)] = \beta_1 \cdot (\ln(2x) - \ln(x)) = \beta_1 \ln(2).$$