

ESM 204 Assignment 3

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1. Linear Probability Model

Create a linear probability model that predicts a respondent's probability of voting "yes" on the ballot based on their age, income, NEP score, the program's risk reduction, and cost of the program to that respondent.

Regression Model:

$$\text{Probability}(\text{Voting Yes}) = 0.1197 + 0.0204(\text{Age to 30}) - 0.0201(\text{Age to 40}) + 0.01(\text{Age to 50}) - 0.0162(\text{Age to 60}) + 0.0088(\text{Income One Percent}) + 0.0027(\text{Income Poor}) + 0.0075(\text{Income Rich}) + 0.0468(\text{Income Very Rich}) + 0.0159(\text{NEP}) - 0.0011(\text{Bid}) + 7 \times 10^{-4}(\text{Risk Reduction})$$

Coefficient Interpretation:

Age: Reference Level Over 65

- to 30:
- to 40:
- to 50:
- to 60:

Income: Reference Level Middle

- One Percent:
- Poor:
- Rich:
- Very Rich:

NEP:

Bid:

Risk:

2. Value of Prevented Whale Deaths

3. Estimated Willingness to Pay for a Vessel Speed Reduction Program

a. Choose three participants at random

Using a random number generator select three participants:

- 38 NEP:32 Income:Rich Age:to30
- 44 NEP:51 Income:Poor Age:to40
- 102 NEP:51 Income:Middle Age:to60

b. Predict willingness to pay for 60% VSR program

Assume the probability of voting yes is 100%, calculate the willingness to pay using the following equations:

Individual 38:

$$1 = 0.1197 + 0.0204(\text{Age to 30}) + 0.0075(\text{Income Rich}) + 0.0159(\text{NEP}) - 0.0011(\text{Bid}) + 7 \times 10^{-4}(0.60)$$

Individual 44:

$$1 = 0.1197 - 0.0201(\text{Age to 40}) + 0.0027(\text{Income Poor}) + 0.0159(\text{NEP}) - 0.0011(\text{Bid}) + 7 \times 10^{-4}(0.60)$$

Individual 122:

$$1 = 0.1197 - 0.0162(\text{Age to 60}) + 0.0159(\text{NEP}) - 0.0011(\text{Bid}) + 7 \times 10^{-4}(0.60)$$

Individual 38:
Willingness to Pay = 321.7901

Individual 44:
Willingness to Pay = 44.8076

Individual 122:
Willingness to Pay = 51.0059