

ECO220Y: Homework, Lecture 20

Readings: Sections 18.6 – 18.7, review sections 18.1-18.4

Exercises: 37, 39, 41, 44

Problems:

(1) Variable “Lottery” measures the percent of income a respondent’s household spends on lotteries. Variable “Education” measures the number of years of education of the respondent (the head of the household). Consider the following STATA summaries of these two variables and regression results.

| Lottery | | | | |
|---------|-------------|----------|-------------|-----------|
| | Percentiles | Smallest | | |
| 1% | 0 | 0 | | |
| 5% | 0 | 0 | | |
| 10% | 0 | 0 | Obs | 100 |
| 25% | 1 | 0 | Sum of Wgt. | 100 |
| 50% | 6.5 | | Mean | 5.39 |
| | | Largest | Std. Dev. | 3.786993 |
| 75% | 8 | 11 | | |
| 90% | 10 | 11 | Variance | 14.34131 |
| 95% | 11 | 12 | Skewness | -.2000242 |
| 99% | 12.5 | 13 | Kurtosis | 1.807037 |

| Education | | | | |
|-----------|-------------|----------|-------------|----------|
| | Percentiles | Smallest | | |
| 1% | 7 | 7 | | |
| 5% | 8 | 7 | | |
| 10% | 9 | 7 | Obs | 100 |
| 25% | 10 | 8 | Sum of Wgt. | 100 |
| 50% | 12 | | Mean | 12.78 |
| | | Largest | Std. Dev. | 3.356224 |
| 75% | 16 | 19 | | |
| 90% | 17 | 19 | Variance | 11.26424 |
| 95% | 18 | 20 | Skewness | .196852 |
| 99% | 20 | 20 | Kurtosis | 1.932887 |

regress lottery education

| Source | SS | df | MS | Number of obs = 100 | | |
|----------|------------|----|------------|------------------------|--|--|
| Model | 546.159633 | 1 | 546.159633 | F(1, 98) = 61.27 | | |
| Residual | 873.630367 | 98 | 8.91459558 | Prob > F = 0.0000 | | |
| Total | 1419.79 | 99 | 14.3413131 | R-squared = 0.3847 | | |
| | | | | Adj R-squared = 0.3784 | | |
| | | | | Root MSE = 2.9857 | | |

| lottery | Coef. | Std. Err. | t | P> t | [95% Conf. Interval] | |
|-----------|-----------|-----------|-------|-------|----------------------|-----------|
| education | -.6998278 | .0894092 | -7.83 | 0.000 | -.8772575 | -.5223982 |
| _cons | 14.3338 | 1.181014 | 12.14 | 0.000 | 11.99012 | 16.67748 |

(a) What is interpretation of the slope estimate?

(b) What is interpretation of the intercept?

- (c) Verify that the Least Squares Line passes through the mean.
- (d) Compute 95% prediction and confidence intervals when given value of education is 15 years. Compute 90% prediction and confidence intervals. Compare. What have you noticed?