File: Ch04, Chapter 4, Prediction, Goodness-of-Fit, and Modeling Issues

Multiple Choice

1. Which of the following leads to large forecast errors?
a.) larger sample size, N
b.) variation in the explanatory variable, x, is large
c.) overall uncertainty in the model, as measured by σ^2, is smaller
d.) the value of $(x_0 - \bar{x})^2$ is larger

2. At what values of x_0 will the standard error of the forecast be smallest?
a.) $x_0 = 0$
b.) $x_0 = \bar{x}$
c.) $x_0^2 = \hat{\sigma}^2$
d.) $x_0 = t_c\, se(f)$

3. Which of the following expressions is NOT equal to $\Sigma(y_i - \bar{y})^2$?
a.) $\Sigma(\hat{y}_i - \bar{y})^2 + \Sigma e_i^2$
b.) SSR + SSE
c.) SSR/SSE
d.) SST

4. What does R^2, the coefficient of determination, measure?
a.) the probability of the true value falling within the forecast interval
b.) the p-value on the coefficient we are using to test our hypothesis of interest
c.) the confidence interval of the error terms as determined by the coefficients
d.) the proportion of the variation in y explained by x within the regression model

5. You have estimated a regression model and your printout includes the following information

s_{xy}= 3614.00
s_x = 12.72
s_y = 394.61
SST = 758912.00.

What is R^2 for this regression model?
a.) .72
b.) .11
c.) .03
d.) .52

6. You have estimated a regression model and your printout includes the following information

s_{xy}= 3614.00

s_x = 12.72
s_y = 394.61
SST = 758912.00.
Use this information to calculate SSE.
a.) 394,634
b.) 364,276
c.) 381.89
d.) 5019.44

7. Which of the following will change if you scale the dependent variable in a simple regression model?
a.) p-value
b.) t-value of β_2
c.) R^2
d.) β_1

8. When should a researcher consider transforming the explanatory variable in the simple linear regression model?
a.) to estimate a coefficient on the dependent variable that matches economic theory
b.) to allow non-constant marginal effects
c.) to reduce variance in the dependent variable
d.) to reduce $se(\hat{\beta}_2)$

9. How do you interpret the estimated value of β_2 in the following model?

$\ln(y) = \beta_1 + \beta_2 * \ln(x)$

a.) the slope of the line representing the relationship between y and x
b) the elasticity of y with respect to x
c.) cannot be determined without more information
d.) the mean value of ln(y) when ln(x) = 0.

10. You have estimated the following simple regression model

$y = 379 + 1.44\ x^3$

What does this model predict y to be when x = 8.49?
a.) 415.68
b.) 690.39
c.) 1260.22
d.) 2205.47

11. You have estimated the following simple regression model
$y = 379 + 1.44\ x^3$
What is the elasticity when x = 8.49?
a.) 263.19
b.) 311.39
c.) 2.10

d.) -24.7

12. You have estimated a model of two variables related such that

ln(y) = 17.3 - .04 x

If x decreases by 2 units, what is the expected change in y?

a.) y decreases by .08 units.
b.) y increases by 8 percent.
c.) y increases by 4 units
d.) y decreases by 8 percent.

13. While working with the sales manager of your firm you have estimated the following model of sales volume as a function of monthly household income:

$$\ln(Q) = 3.418 + 1.212 * \ln(I)$$
$$(0.781) \quad (0.392)$$

Where Q is monthly sales volume, I is monthly household income in thousands, and standard errors are listed below the parameter estimates.

What is the income elasticity of your firm's product?

a.) 1.212
b.) 2.206
c.) 3.418
d.) 4.630

14. While working with the sales manager of your firm you have estimated the following model of sales volume as a function of monthly household income:

$$\ln(Q) = 3.418 + 1.212 * \ln(I)$$
$$(0.781) \quad (0.392)$$

Where Q is monthly sales volume, I is monthly household income in thousands, and standard errors are listed below the parameter estimates.

What does the model predict sales volume to be if using the corrected predictor when income is $4000 per month?

a.) 708,133.68
b.) 723,146.11
c.) 163.73
d.) 167.20

15. What hypothesis is tested when using the Jarque-Berra test ?

a.) H_0: The model is correctly specified as estimated
b.) H_0: The error terms are normally distributed
c.) H_0: The error terms are uncorrelated with x
d.) H_0: The error terms are random