File: Ch06, Chapter 6, Further Inference in the Multiple Regression Model

Multiple Choice

1. The following model has been estimated using a dataset with 4854 observations.

	SS	df	MS
Regression	919587.543	4	229896.9
Error	2590390.62	4849	534.2113

Variable	β	Std. Error	t	P>|t|
x2	-0.0126355	0.005519	-2.28937	0.022
x3	0.5957923	0.014482	41.13934	0.000
x4	1.124589	0.877192	1.282032	0.200
x5	0.3237421	0.060709	5.332661	0.000
Constant	8.86016	1.766116	5.016749	0.000

Calculate the F-statistic to test **H_0: $\beta_2 = \beta_3 = \beta_4 = \beta_5 = 0$**
a.) 430.35
b.) .2620
c.) 76.80
d.) 2.8169

2. The critical value for a given p-value in the F-distribution depends on the degrees of freedom in the numerator and denominator. How do you find the degrees of freedom in the numerator?
a.) It is the number of observations minus the number of coefficients estimated (N-K)
b.) It is the number of hypotheses being tested simultaneously (J)
c.) It is the number of coefficients being estimated (K)
d.) It is the number of observations minus the number of hypotheses tested (N-J)

3. The critical value for a given p-value in the F-distribution depends on the degrees of freedom in the numerator and denominator. How do you find the degrees of freedom in the denominator?
a.) It is the number of observations minus the number of coefficients estimated (N-K)
b.) It is the number of hypotheses being tested simultaneously (J)
c.) It is the number of coefficients being estimated (K)
d.) It is the number of observations minus the number of hypotheses tested (N-J)

4. When performing an F-test, if the null hypothesis is $\mathbf{H_0: \beta_2 = \beta_3 = 0}$ what is the alternative hypothesis?
a.) $\beta_2 \neq 0$ and $\beta_3 \neq 0$
b.) $\beta_2 \neq 0$ or $\beta_3 \neq 0$
c.) ($\beta_2 \neq 0$ and $\beta_3 = 0$) or ($\beta_2 = 0$ and $\beta_3 \neq 0$)
d.) ($\beta_2 < 0$ and $\beta_3 > 0$) or ($\beta_2 > 0$ and $\beta_3 < 0$)

5. The $F_{(1,218)}$ distribution is equivalent to what distribution?
a.) N (1,218)
b.) $F_{(2, 114)}$
c.) $t_{(218)}$
d.) $\chi^2_{(2,114)}$

6. What statistical test allows joint hypotheses to be tested?
a.) Breusch-Pagan Test
b.) t-test
c.) Gauss-Markov
d.) F-test

7. If your computer printout includes an F-statistic and p-value for the overall model, how should you interpret the p-value?
a.) the probability that all of the coefficients are actually equal to zero
b.) the probability that all of the coefficients other than the intercept are actually zero and we would observe the estimated results
c.) the probability that the model is completely invalid
d.) the probability that the model is incorrectly specified

8. How does omitting a relevant variable from a regression model affect the estimated coefficient of other variables in the model?
a.) they are biased downward and have smaller standard errors
b.) they are biased upward and have larger standard errors
c.) they are biased and the bias can be negative or positive
d.) they are unbiased but have larger standard errors

9. How does including an irrelevant variable in a regression model affect the estimated coefficient of other variables in the model?
a.) they are biased downward and have smaller standard errors
b.) they are biased upward and have larger standard errors

c.) they are biased and the bias can be negative or positive
d.) they are unbiased but have larger standard errors

10. Which of the following measures is NOT used to evaluate model specification?
a.) adj R^2
b.) Akiake Information Criterion (AIC)
c.) Bayesian Information Criterion (BIC)
d.) Jarque-Bera Test

11. When are R^2 and adjusted R^2 equal?
a.) when the model is correctly specified
b.) when K = 1
c.) when the error terms are normally distributed
d.) when an unrestricted model is estimated

12. You estimate 4 different specifications of an econometric model by adding a variable each time and get the following results

	R^2	adj R^2	AIC
Model A	0.3458	0.3285	22.56
Model B	0.3689	0.3394	22.37
Model C	0.4256	0.3916	21.21
Model D	0.4299	0.3911	21.79

Which model appears to be correctly specified?
a.)A
b.)B
c.)C
d.)D

13. If you reject the null hypothesis when performing a RESET test, what should you conclude?
a.) at least one of the original coefficients is not equal to zero
b.) the original model is incorrectly specified and can be improved upon
c.) relevant variable are omitted and the coefficient estimates of included variables are biased
d.) an incorrect functional form was used

14. When collinear variables are included in an econometric model coefficient estimates are
a.) biased downward and have smaller standard errors
b.) biased upward and have larger standard errors

c.) biased and the bias can be negative or positive
d.) unbiased but have larger standard errors

15. When a set of variables with exact collinearity is included in an econometric model coefficient estimates are
a.) undefined
b.) unbiased
c.) biased upward
d.) biased, but the direction is unclear

16. If your regression results show a high R^2, adj R^2, and a significant F-test, but low t values for the coefficients, what is the most likely cause?
a.) omitted relevant variables
b.) irrelevant variables included
c.) collinearity
d.) heteroskedasiticity

17. Running auxillary regressions where each explanatory variable is estimated as a function of the remaining explanatory variables can help detect
a.) omitted relevant variables
b.) irrelevant variables included
c.) collinearity
d.) heteroskedasiticity

18. Why is the variance of the forecast y larger than the variance of the expected value of y?
a.) the estimated forecast variance includes an estimate of $\hat{\sigma}^2$
b.) the estimated forecast variance includes weighted covariance terms of all paired variables
c.) the Gauss-Markov theorem does not apply to forecast of a single observation
d.) the expected value of confidence intervals rely on the standard normal distribution while forecast use a t distribution.