

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

Ans: a

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)

Ans: b

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)

Ans: a

4. When performing an F-test, if the null hypothesis is $H_0: \beta_2 = \beta_3 = 0$ 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 $\beta_3 < 0$)

Ans: b

5. The $F_{(1,218)}$ distribution is equivalent to what distribution?

- a.) $N(1,218)$
- b.) $F_{(2,114)}$
- c.) $t_{(218)}$
- d.) $\chi^2_{(2,114)}$

Ans: c

6. What statistical test allows joint hypotheses to be tested?

- a.) Breusch-Pagan Test
- b.) t-test
- c.) Gauss-Markov
- d.) F-test

Ans: d

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

Ans: b

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

Ans: c.

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

Ans: d

10. Which of the following measures is NOT used to evaluate model specification?

- a.) $\text{adj } R^2$
- b.) Akaike Information Criterion (AIC)
- c.) Bayesian Information Criterion (BIC)
- d.) Jarque-Bera Test

Ans: d

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

Ans: b

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

	R^2	$\text{adj } R^2$	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

Ans: C

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

Ans: b (the misspecification does not have to be an omitted variable)

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

Ans: d

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

Ans: a

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.) heteroskedasticity

Ans: c

17. Running auxiliary 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.) heteroskedasticity

Ans: c

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.

Ans: a