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Deriving Estimators in MV Linear Model - Quiz

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Question 1

1.0 point possible (graded)

True or False: If the errors are not normally distributed, $\boldsymbol{E}[\hat{\beta}] \neq \beta$.

- a. True
- b. False ✔

Explanation

The distribution of the errors only affects the distribution of $\hat{\beta}$. However, $\hat{\beta}$ is an unbiased estimator irrespective of the distribution of the errors. This assumption is useful for inference purposes (recall the discussion on hypothesis testing, you need to make an assumption about the underlying distribution so you have something to compare your estimator to!).

Submit You have used 1 of 1 attempt

✔ Correct (1/1 point)

Question 2

1/1 point (graded)

Based on the multivariate results Prof. Ellison showed in class, what happens to your estimator for the variance as you add more regressors?

- a. The variance increases.
- b. It depends on the explanatory power of the additional variable. ✔
- c. The variance decreases.
- d. This does not affect variance.

Explanation

Recall the formula for the variance estimator:

$$\hat{\sigma}^2 = \frac{\hat{\epsilon}^T \hat{\epsilon}}{(n-k)}$$

The Multivariate Linear Model
due Nov 28, 2016 05:00 IST

Module 9: Homework
due Nov 21, 2016 05:00 IST

- Module 10: Practical Issues in Running Regressions, and Omitted Variable Bias
- Exit Survey

Where denotes the residuals, and denotes the residual variance (i.e the variance of that's not explained by your regressors.) So if your additional regressor has no explanatory power, adding a regressor will just increase your degrees of freedom k, and leave the residual variance fixed, thereby increasing your variance estimator. However, if your regressor explains some of the variation in your model, then adding it will decrease your variance.

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Discussion
Topic: Module 9 / Deriving Estimators in MV Linear Model - Quiz

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