

MITx: 14.310x Data Analysis for Social Scientists

Heli



- Module 1: The Basics of R and Introduction to the Course
- Entrance Survey
- Module 2:

   Fundamentals of
   Probability, Random

   Variables, Distributions,
   and Joint Distributions
- Module 3: Gathering and Collecting Data, Ethics, and Kernel Density Estimates
- Module 4: Joint,
   Marginal, and
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   Distributions &
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Module 9: Single and Multivariate Linear Models > The Multivariate Linear Model > Deriving Estimators in MV Linear Model - Quiz

# 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,  $E[\hat{eta}] 
eq eta$ .

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

- Module 5: Moments of a Random Variable. Applications to Auctions, & Intro to Regression
- Module 6: Special Distributions, the Sample Mean, the Central Limit Theorem, and Estimation
- Module 7: Assessing and **Deriving Estimators -**Confidence Intervals, and Hypothesis Testing
- Module 8: Causality, **Analyzing Randomized** Experiments, & **Nonparametric** Regression
- Module 9: Single and **Multivariate Linear** Models

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

Ø.

Correct (1/1 point)

### **Question 2**

1/1 point (graded)

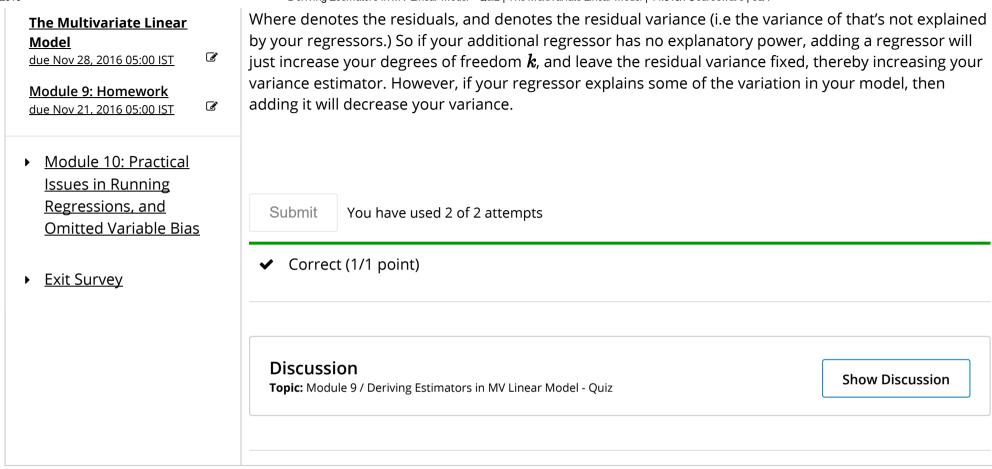
Based on the multivariate results Prof. Ellison showed in class, what happens to your estimator for the variance as you add more regressors?

- 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:

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



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