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## Module 9: Single and Multivariate Linear Models &gt; The Linear Model &gt; Comparative Statics - Quiz

## Comparative Statics - Quiz

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### Question 1

1/1 point (graded)

If the error variance ( $\sigma^2$ ) of our estimates is larger, we can estimate the linear relationship between Y and X more precisely.

☐ a. True☒ b. False ✓

### Explanation

A higher error variance means that the variance of our  $\hat{\beta}$ s is higher, meaning that we should be less sure of our estimates. This means we should have less confidence in our ability to estimate the linear relationship precisely.

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**The Linear Model**

due Nov 28, 2016 05:00 IST



✓ Correct (1/1 point)

**Question 2**

1/1 point (graded)

Greater variance in  $\mathbf{X}$  ( $\sigma_x^2$ ) means greater variance in our estimates  $\hat{\beta}$ .☐ a. True☒ b. False ✓**Explanation**

As the variance in  $\mathbf{X}$  decreases, the variance in our estimates increases because we don't have a lot of variation in  $\mathbf{X}$  to identify the effect we are interested in. Remember that the limit (when there is no variance in  $\mathbf{X}$ ), we cannot estimate the linear regression coefficients  $\hat{\beta}$  at all.

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✓ Correct (1/1 point)

**Question 3**

1/1 point (graded)

## 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](#)

Professor Ellison discusses a mechanical relationship between the two estimates  $\beta_0$  and  $\beta_1$ . Which of the following is true about the relationship between  $\bar{X}$ , estimates of  $\beta_0$  and  $\beta_1$ ?

- ☐ a. If  $\bar{X} > 0$ , an overestimate of  $\hat{\beta}_0$  will likely lead to an overestimate of  $\hat{\beta}_1$ .
- ☒ b. If  $\bar{X} > 0$ , an underestimate of  $\hat{\beta}_0$  will likely lead to an overestimate of  $\hat{\beta}_1$ .
- ☐ c. If  $\bar{X} > 0$ , an underestimate of  $\hat{\beta}_0$  will likely lead to an underestimate of  $\hat{\beta}_1$ .
- ☒ d. If  $\bar{X} > 0$ , an overestimate of  $\hat{\beta}_0$  will likely lead to an underestimate of  $\hat{\beta}_1$ .



### Explanation

We know that  $\hat{\beta}_0$  and  $\hat{\beta}_1$  are related as follows:  $\hat{\beta}_0 = \bar{Y} - \hat{\beta}_1 \bar{X}$ . Therefore, if we overestimate or underestimate the intercept  $\beta_0$ , then the slope  $\beta_1$  will have to make up for it (by doing the opposite).

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You have used 1 of 2 attempts

✓ Correct (1/1 point)

Discussion

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**Topic:** Module 9 / Comparative Statics - Quiz

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