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- ▶ [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 Conditional Distributions & Functions of Random Variable](#)

Module 10: Practical Issues in Running Regressions, and Omitted Variable Bias > Practical Issues in Running Regressions > Using the F-test - Quiz

## Using the F-test - Quiz

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### Question 1

1/1 point (graded)

Which of the following null hypotheses is the default F-test statistic computed by R testing?

- ☐ a. the hypothesis that none of the coefficients on your regressors is equal to 0.
- ☐ b. the hypothesis that any of the coefficients on your regressors is equal to 0.
- ☐ c. the hypothesis that all of your coefficients are equal to 0.
- ☒ d. the hypothesis that all of your coefficients with the exception of the intercept are equal to 0.



### Explanation

The default F-stat reported by R tests the null hypothesis that all your coefficients, with the exception of the intercept are equal to 0. C is incorrect because the set of coefficients on your regressors does not include the intercept.

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✓ Correct (1/1 point)

## Question 2

1/1 point (graded)

**True or False:** If you have only one regressor, the default F-test statistic and t-test statistic reported by R for the coefficient on that regressor will be equivalent. Here "equivalent" means whether you derive the same conclusion of the test. (Intutievly, think whether there is a relationship between the t and the F statistics.)

☒ a. True ✓☐ b. False

## Explanation

As Prof. Duflo showed in lecture, the F-test statistic computed by R is testing whether each of the coefficients on your regressors is equal to 0, whereas the reported t-test statistic is testing that the specific coefficient is equal to 0. Therefore, if you only have one regressor, these will be equivalent. In particular, the reported F-test statistic will be the square of the reported t-test statistic.

## Regressions, and Omitted Variable Bias

### Practical Issues in Running Regressions

due Dec 5, 2016 05:00 IST



### Omitted Variable Bias

due Dec 5, 2016 05:00 IST



### Module 10: Homework

due Nov 28, 2016 05:00 IST



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### Question 3

1/1 point (graded)

Suppose you are interested in the effect of education on wages. To this goal, you run the following regression in R:

$$\log(\text{wage})_i = \alpha + \beta \text{years of education}_i + \epsilon_i$$

where  $i$  indexes the individuals in your sample. The reported t-test statistic on  $\beta$  is 2.09, and the reported coefficient is  $\hat{\beta} = 0.10$ . Furthermore, you know your sample size is large enough for the t-distribution to be very close to a normal distribution.

What can you conclude given this information?

- ☐ a. You accept the null that  $\beta = 0$  at the 95% confidence level.
- ☒ b. You reject the null that  $\beta = 0$  at the 95% confidence level. ✓
- ☐ c. You are 95% sure that  $\beta = 0$ .

- ☐ d. You are **95%** sure that  $\beta = 0.10$ .
- ☐ e. You are **95%** sure that  $\beta$  is positive.

### Explanation

The reported t-test statistic tests the specific null hypothesis  $H_0 : \beta = 0$ , against the alternative hypothesis  $H_1 : \beta \neq 0$ . R's default is to report test-statistics at the **5%** significance level. If you want to test a different hypothesis (ex.  $\beta > 0$ ) you need to construct a different test. In practice, R will do that for you. Look up the R command "linearHypothesis" for more details.

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### Discussion

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