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More on Inference in the Linear Model - Quiz

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Question 1

1/1 point (graded)

Suppose you are interested in testing hypotheses of the following form:

$$H_0 : R\beta = c$$

$$H_1 : R\beta \neq c$$

Suppose R and c are as follows:

$$R = [0 \ 0 \ 1 \ 1 \ 1 \ 0], c = 1$$

What hypotheses would this be testing?

- ▶ Module 5: Moments of a Random Variable, Applications to Auctions, & Intro to Regression
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The Linear Model

due Nov 28, 2016 05:00 IST



- ☐ a. The set of coefficients $\beta_2 = \beta_3 = \beta_4 = 1, \beta_5 = 0$
- ☐ b. The set of coefficients $\beta_1 = \beta_2 = \beta_3 = 1, \beta_4 = 0$
- ☒ c. $\beta_2 + \beta_3 + \beta_4 = 1$ ✓
- ☐ d. A subset of the coefficients are all equal.

Explanation

Write out the matrix multiplication:

$$R\beta = [0 \ 0 \ 1 \ 1 \ 1 \ 0] \begin{bmatrix} \beta_0 \\ \beta_1 \\ \beta_2 \\ \beta_3 \\ \beta_4 \\ \beta_5 \end{bmatrix} = \beta_2 + \beta_3 + \beta_4 = c = 1$$

Submit

You have used 1 of 2 attempts

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](#)

✓ Correct (1/1 point)

Question 2

1/1 point (graded)

Using the same setup discussed in class, and in the previous questions, suppose we have a model with 5 parameters, and want to test the hypotheses that $\beta_1 = \beta_2$, $\beta_3 + \beta_4 = 1$, and $\beta_5 = 10$. Fill in the missing elements of the matrix of restrictions \mathbf{R} and the vector \mathbf{c} (Note: the elements to fill in are bolded and underlined below):

$$\mathbf{R}\beta = \begin{bmatrix} 0 & 1 & \underline{\mathbf{a}} & 0 & 0 & 0 \\ 0 & 0 & \underline{\mathbf{b}} & \underline{\mathbf{c}} & 1 & 0 \\ 0 & 0 & 0 & 0 & \underline{\mathbf{d}} & \underline{\mathbf{e}} \end{bmatrix} \begin{bmatrix} \beta_0 \\ \beta_1 \\ \beta_2 \\ \beta_3 \\ \beta_4 \\ \beta_5 \end{bmatrix} = \mathbf{c} = \begin{bmatrix} \underline{\mathbf{f}} \\ \underline{\mathbf{g}} \\ \underline{\mathbf{h}} \end{bmatrix}$$

A:

-1

✓ Answer: -1

-1

B:

✓ Answer: 0

C:

✓ Answer: 1

D:

✓ Answer: 0

E:

✓ Answer: 1

F:

✓ Answer: 0

0

G:

1

✓ Answer: 1

1

H:

10

✓ Answer: 10

10

Explanation

$$R\beta = \begin{bmatrix} 0 & 1 & -1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} \beta_0 \\ \beta_1 \\ \beta_2 \\ \beta_3 \\ \beta_4 \\ \beta_5 \end{bmatrix} = c = \begin{bmatrix} 0 \\ 1 \\ 10 \end{bmatrix}$$

This follows immediately from the matrix multiplication

$$R\beta = \begin{bmatrix} 0 & 1 & -1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} \beta_0 \\ \beta_1 \\ \beta_2 \\ \beta_3 \\ \beta_4 \\ \beta_5 \end{bmatrix} = \begin{bmatrix} \beta_1 - \beta_2 \\ \beta_3 + \beta_4 \\ \beta_5 \end{bmatrix} = \begin{bmatrix} 0 \\ 1 \\ 10 \end{bmatrix}$$

You have used 1 of 2 attempts

✓ Correct (1/1 point)

Discussion

Topic: Module 9 / More on Inference in the Linear Model - Quiz

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