

Answers to Exam No. 1 on Topics from Chapters 2 through 7

1. $H_0: \mathbf{b}_i = 0$ for $i = 6, \dots, 10$.

2. Model A is the unrestricted model and Model B is the restricted model. Compute

$$F_c = \frac{(ESSA - ESSB)/5}{ESSA/(116 - 10)} = \frac{(5172.56 - 763.029)/5}{763.029/106} = 122.51$$

Under H_0 : , $F_c \sim F_{5,106}$.

3. From the F -table for 1 percent level, $F_{5,106}^*(0.01)$ is between 3.17 and 3.34. Since $F_c > F^*$, we reject H_0 and conclude that there has been a significant change in the structure.

4. Six out of the eight model selection criteria choose Model C as the best. But Model C \mathbf{b}_2 and \mathbf{b}_8 with p -values slightly above 10 percent. Omitted variable bias suggests that it is better to leave a variable in a model if it appears to have some effect. Since \mathbf{b}_2 and \mathbf{b}_8 are only slightly insignificant, Model C is the best.

5.

	1980 data	1990 data
Famsize	4.944	4.944 + 9.760 = 14.704
Highschl	0.223	0.223 + 0.199 = 0.422
College	0.339	0.339 + 0.871 = 1.210

6. In 1990, an increase in family size of one person resulted in an average increase of \$14,704 in median income. This is \$9,760 more than the same marginal effect in 1980.

A one percent increase in high school graduates increased median income on average by \$422 in 1990, which is \$199 more than the marginal effect in 1980.

A one percent increase in college graduates increased median income on average by \$422 in 1990, which is \$199 more than the marginal effect in 1980.