

17.874, Spring 2004  
Problem Set 4

1. Warwick and Druckman (British Journal of Political Science 2001) regress a party's share of cabinet posts on that party's share of seats. They argue that no intercept need be included in the regression as the theoretical model they have supposed assumes a zero intercept.
  - a. Derive the formula for slope in the regression of  $y$  on  $X$  (1) when there is a constant and (2) when there is no constant. Comment on the difference between the formulae.
  - b. Call  $b_1$  the slope when the intercept is omitted and  $b_2$  the slope in the regression that has an intercept. What is the expected value of each of these slopes, assuming  $\alpha = 0$ ?
  - c. If  $\alpha = 0$  are the expected values the same?
  - d. What is the  $V(b)$  (1) when an intercept is included, and (2) when it is not?

(Greene, Chapter 4, Problems 2 and 3 are variants on this problem.)

2. Greene, Chapter 4. Problem 11.