

Temple University  
Department of Economics

Econometrics I  
Simple Regression

1. Suppose we specify the population regression model to be

$$y_i = a + b x_i + u_i$$

Where  $x_i$  is a composite price index based on 500 common stocks and  $y_i$  is aggregate investment during the next period. We wish to estimate the model parameters from twenty observations. The following information has been calculated:

$$\bar{y} = \frac{1}{n} \sum y_i = 88.915 \quad , \quad \bar{x} = \frac{1}{n} \sum x_i = 688.92 \quad , \quad s_y^2 = \frac{1}{n-1} \sum (y_i - \bar{y})^2 = 11,485/19$$

As well as the additional calculations;

$$s_x^2 = \frac{1}{n-1} \sum (x_i - \bar{x})^2 = 628713/19$$

$$s_{xy} = \frac{1}{n-1} \sum (x_i - \bar{x})(y_i - \bar{y}) = 77685/19$$

a. What are the least squares estimates of the intercept and slope for this model?

b. The following calculations have also been made:

$$\sum (y_i - \hat{y}_i)^2 = 1901$$

$$\sum (\hat{y}_i - \bar{y})^2 = 9584$$

What is your estimate of  $\text{Var}(u_i)$ ?

c. At the 5% level of significance would you accept or reject the null hypothesis that the slope coefficient is no different from zero?

d. At the 5% level of significance test

$$H_0: a = 0$$

$$H_1: a \neq 0$$