

## Chapter 12

4 a) we have explained 94% of the variation in  $y$  with our regression

5  $H_0: \beta_i = 0$      $t_{obs1} = \frac{1.24}{.42} = 3.071$      $t_{obs2} = \frac{2.72}{.65} = 4.185$      $t_{obs3} = \frac{.4}{.17} = 2.412$

$H_a: \beta_i \neq 0$      $t_{crit} = 2.201$

$df = 3 - 1 = 2$

$i = 1, 2, 3$

$t_{obs1} > t_{crit}$      $t_{obs2} > t_{crit}$      $t_{obs3} > t_{crit}$

Reject  $H_0$  for all coefficients so each of them contribute in formation in the prediction of  $y$

16 a)  $y = \alpha + \beta_1 x_1 + \beta_2 x_2 + \epsilon$      $y =$  ave closing bid     $x_1 =$  <sup>+</sup>Aster price  
 $x_2 =$  Ave Buyers bid

b)  $\hat{y} = 81.6 + .3564 x_1 + .5915 x_2$

c)  $R^2 = .99$  we've explained 99% of the variation in  $y$

d)  $H_0: \beta_1 = \beta_2 = 0$

$H_a: \beta_1 \neq 0$  or  $\beta_2 \neq 0$

$F_{obs} = 426.37$

$df_1 = 2$

$df_2 = 7$

$F_{crit} = 4.74$

Reject  $H_0$  - model contributes info

e) 0.000 p-value

- 17 a)  $INDEX = \alpha + \beta_1 \text{income} + \beta_2 \text{Price}$   $\epsilon^2$   
 b)  $\widehat{INDEX} = 83.93 + 1.0258(\text{income}) - .47(\text{price})$   
 c)  $R^2 = .814$  we've explained 81.4% of the variation in Y

f)  $R^2$  for each individual regression in 11.22 are much lower than in this case with them combined into one regression ( $R^2 = .538$  and  $.066$  vs.  $R^2 = .814$  here) and most importantly notice that the adjusted  $R^2$  squared increased with the addition of the other variable so we are really encouraged we have a better estimation

d)  $H_0: \beta_1 = \beta_2 = 0$   $F_{obs} = 18.30$   $\begin{matrix} df_1 = 2 \\ df_2 = 7 \end{matrix} = F_{crit} = 4.74$   
 $H_A: H_0$  is false

$F_{obs} > F_{crit}$  reject  $H_0$   
 + here is explanation