

## MS Module 18: Regression analysis: Fitted values and predictions (overview)

(The attached PDF file has better formatting.)

Reading: §12.4 Inferences concerning  $\mu_{Y \cdot x^*}$  and the prediction of future values

Know how to form the confidence interval for  $\mu_{Y \cdot x^*}$  and the prediction interval for a single  $Y$  value. The point estimates for these two items are the same, but the prediction interval is wider.

The formulas are similar; they depend on  $\sigma^2$ , the number of observations  $n$ , and the squared deviation of the  $x$  value from its mean. The prediction interval has an extra term (a “1”) under the square root sign.

The upper and lower limits of the confidence interval and the prediction interval get farther apart as  $x$  moves away from  $\bar{x}$ . The opposite relation is true for standard deviations of residuals, discussed in a later module).

A final exam problem may give  $x$  values and the width of the 99% confidence interval for the fitted value at one point and ask for the width of the 95% prediction interval at another point.

The final exam does not test Bonferroni intervals.