Notes

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Notes

Lecture 3 Notes

For ML we will always need to specify the distribution. We are asking what value of theta given the observations we have seen from an assumed/known distribution.

How does the information matrix relate to the Variance? The information matrix is the second derivative of the the log likelihood, so the slope of the slope, if we have determined the slope and that in itself is not steep then it is hard to pinpoint where our solution lies, (thinking along 2d lines if we have a line of very small slope any small change in y can lead to a large change in X so hard to pinpoint our variable, if it is steeper a small change in y will lead to a small change in x so easier to estimate our paramater) so if the second derivative is small, or information martix is small, then the variance in our estimate of our paramater can be large. If the second derivative is large then the information matrix is large and variance in our estimator is less.

The ML estimator is normally distributed and is efficient.

Log Likelihood: We are assuming independence here in our original notes, hence the joint distribution is the product of their marginal distributions. This is not the case for a time-series but we will look at this later. (Assume a product of their conditional distributions and marginals)

Questions

The example in Log likelihood $L(\theta) = f(y_1, \theta)f(y_2, \theta)f(y_T, \theta)$, we are assuming each sample is independent, what if this is not the case? e.g. if y_t is not independent of y_{t-1}, e.g. if we take the price of an equity this is not indpendent, but if we take the return this would be independent.

Lecture 5 Notes

Looking at testing and inference. Could this estimate have happened by chance. We will look at distributions of the estimators.

If the p-value is small it is unlikely that the estimate was generated by the true value

p-value think about it as the probability the null hypothesis is true

why is individual null hypthoses a t-test and join and f-test?, how is this linked to what we saw ,

Joint and individual tests can conáict

trying to link the linear restrictions we impose with what

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Log Likelihood: We are assuming independence here in our original notes, hence the joint distribution is the product of their marginal distributions. This is not the case for a time-series but we will look at this later

Thinking of the null hypothesis, our starting point that this is true, if this is true and we reject it this is type 1, if this is false and we accept it then this is type 2, so type 1 is getting our starting point wrong, type two is accepting when it is false

t-ratio distributed around 0 with a t-distribution if the null hypothesis is true

Use BIC model selection criteria in general.

Exams will contain output from a statistical programmes and we will be asked questions on this.