

## TS Module 11 Simulated and actual time series

(The attached PDF file has better formatting.)

- Specification of simulated time series
- Specification of actual time series

Read Section 6.3, "Specification of simulated time series," on pages 117-124. The text shows how to use correlograms to identify the time series. You use these tools for your student project.

Read Section 6.4, "Non-stationarity," on pages 124-128.

Know the problems of over-differencing on pages 126-128. Some student projects make this error at first. A candidate may feel that the correlogram does not approach zero fast enough and takes a second difference. Sometimes this is correct; more often it is wrong.

Be sure that differencing is warranted in your project. If you take a second difference, say why it is justified. The time series may be a combination of two ARIMA(1,1,0) processes with different values for  $\mu$  or  $\phi$ . Taking second differences obscures the true parameters.

For your student project, consider taking logarithms before first differences. If you have a long enough time series, such as average claim severities in nominal dollars for forty years, you see the exponential curve. For a short time series, such as twelve months of daily stock prices, you won't see the exponential pattern in the sample points.

The final exam does not test the Dickey-Fuller Unit-Root test on pages 128-130. You may want to use this tool in your student project, though. It provides a quantitative test for non-stationarity that you may use in addition to graphic analysis.

Read Section 6.6, "Specification of actual time series," on pages 133-140. The final exam does not test these time series, but this section helps you in your student project.