

Lab Assignment 2, Math 590C

Due Nov. 29, 2005

Data: Two interest rate series, the AAA corporate bond rate for the years 1953 through 1970 and the U.S. federal fund interest rate for the years 1966 through 1980, are in two files: “aaa1.dat” and “fedfund1.dat” of the disk. The AAA corporate bond series has $T=72$ data points of quarterly observations, while the federal fund rate series has $T=180$ monthly observations. They can be obtained at “<http://mendota.umkc.edu/teaching/m561.html>”.

Objective: The objective of this assignment is find adequate models for the two series using the same criteria and format as explained in Lab Assignment 1. Your analysis and report should be carried out in a similar manner and using the same guidelines as for Lab Assignment 1. Note that the degrees of differencing, d , might not be zero for these data.

In addition to this, forecast 20 periods ahead using your model. (This can be done by choosing “forecast” in the “ARIMA” window.)

For the federal fund series, consider performing your analysis (also) on the *natural* logarithms of the data, and on the basis of your analysis indicate why the analysis of the ln-data may be preferred for this series.

To-do List for the “final” model that you use for each series,

1. obtain 20 forecasts by Minitab,
2. determine the mathematical form of the “eventual” forecast function $\hat{Y}_t(l)$ based on the ARIMA model you have fitted to the data,
3. and relate this to the actual forecasted values you have obtained.
4. Also, find the values of the ψ_j weights, $j = 1, 2, 3$, of the ARIMA model for each series,
5. from these ψ_j , determine the standard deviations of the forecast errors for $l = 1, 2, 3$, step ahead forecast,
6. and compare these standard deviations with Minitab output.

Note that, in practice, the ‘long-term’ forecasts are usually not as useful as the ‘short-term’ forecast. The purpose of computing and displaying forecasts for 20 time periods ahead is to see the form of the ‘eventual’ (long-term) forecast function.

Comment on whether the forecasts look reasonable in comparison with the observed series, in one or two sentences.