

ECON 4115/5115 Outline of Lecture Notes

Chapter 4. Time Series Features

- This chapter looks at additional exploratory features of a time series.
- The features() function, similar to summary(), is useful to calculate ...
 - Means & quantiles
 - Minimum and maximum
- The feat_acf() calculates various types of autocorrelation functions, such as ...
 - $ACF(j) = \frac{(1/T) \sum_{t=j+1}^T (y_t - \bar{y})(y_{t-j} - \bar{y})}{var(y_t)}$ where $0 \leq ACF(j) \leq 1$ for $j = 0, 1, 2, ..$
 - Sum of first 10 autocorrelations (i.e., ACFs)
 - Autocorrelations for differenced and seasonal differenced data
- Features of STL decompositions
 - Recall, for the additive decomposition: $y_t = T_t + S_t + R_t$
 - The feat_stl() function will calculate useful measures such as
 - $F_T = \max\left(0, 1 - \frac{var(R_t)}{var(T_t + R_t)}\right)$
 - $F_S = \max\left(0, 1 - \frac{var(R_t)}{var(S_t + R_t)}\right)$
 - Spikiness, linearity, and curvature measures
- The “feasts” package will calculate a vector of other useful time series features (e.g., ...
 - bp_stat & lb_stat (white noise statistic)
 - partial autocorrelations
 - n_crossing_points and n_flat_spots