

Calculating business cycle statistics:

How similar are business cycle facts across countries?

For this exercise you should obtain (quarterly) data on macroeconomic aggregates such as GDP and its components, the unemployment rate, inflation, interest rates from your own country; if you do not have access to these data, you can download these series for the US and other developed countries from [St Louis Fed' FRED](#) or [Eurostat](#).

1. Once you have the raw data, take logarithms unless a time-series is expressed in percentage terms (e.g. unemployment rate, inflation).
2. Filter the raw data using the Hodrick-Prescott filter. This can be done using many different programs ([Excel](#), Eviews, Matlab). Calculate the stochastic trend of each series; subtract the trend from the original series to obtain the cyclical component. In the RBCfacts zip folder I have done this in Matlab using data for the US.
3. Calculate the standard deviation of each variable and divide it by the standard deviation of the cyclical component of GDP. Which variables have cyclical components that are more volatile than GDP? Which ones less?
4. Calculate the autocorrelation (i.e. the correlation coefficient between a variable and its one-period lag). Are cyclical components highly persistent or do they revert quickly back to their mean?
5. Calculate the cross-correlation between different leads and lags of cyclical components and the cyclical component of GDP. Which variables are procyclical, countercyclical and acyclic? Which ones lead GDP and which ones lag it?