**Topics in Macroeconometrics, EUI**
**Fall 2013**
**Fabio Canova**

**Homework 1**

**To be done in groups of 3.** We want to study the transmission of shocks to the term structure of interest rates (which is one of the QE measures used). Collect data for your favorite country and consider both a small scale (Y, P, term, M, hours or employment) and a large scale VAR (depending on what you find include additional variables) or a FAVAR. Make sure you include proper financial data and/or foreign variables if the economy is small and explain your choices.

1) Specify your VAR appropriately (in particular select reasonable transformation of the data and check whether volatility changes or not). Setup up a prior and estimate the model using the Bayesian approach which is consistent with the choices you have made above - keep 2 years for later use. Choose your identification restrictions meaningfully and report standard error bands which take into account parameter (and identification if any) uncertainty. Make sure you clearly explain how many shocks you identify and why.

2) Compare impulse responses in the two systems are they different? Why?

3) Forecast out of sample unconditionally for 4 periods and conditionally. What should we expect to happen to output and inflation in the next year? Back out the shocks to the term structure which are consistent with an annual output growth of 2 percent and an inflation rate of 2 percent over the next year. Repeat the exercise requiring an annual output growth of 4 percent. What advise would you give to policymakers that want to foster growth via monetary policy actions?

**Homework 2**

Collect data for output, government debt, inflation and long term interests rates for as many countries as you can find. Consider the question of what are the effects of the level of debt to GDP ratio on inflation in the long run (a recent papaer dealing with this issue is Kliem, Kriwolutzky, Sarferaz (2013): On the low freqnecy relationship between public deficits and inflation).

1) Run a static panel using average levels of the two variables. Test the hypothesis that the pass through is one.

For points 2) and 3) use 4 randomly selected countries for your sample.

2) Consider a dynamic homogeneous panel of the following form

$$\pi_{it} = \alpha_i + \rho\pi_{it-1} + \beta(\frac{Debt}{GDP})_{it} + e_{it} \tag{1}$$

Estimate the long run effect of Debt/GDP on inflation.Test the unitary pass through hypothesis. How does the coefficient here differ from the one in 1)?

3) Run a VAR with the four variables you have collected, allowing both the intercept and the slope to be different. Compute the average long run effect using a average time series estimator. Repeat the exercise using a (bayesian) random coefficient approach. Test whether there is dynamic heterogeneity in the panel. Examine the hypothesis that there is unitary pass through from debt/GDP to inflation.

Note: in 3) you will have to choose the number of lags, the preliminary transformation to be used, etc. You need to motivate your answer here.