

Empirical Project II (no more than 2 pages)
(See the deadline to upload it in Aula Global in my web page)

- **Granger Causality:** Specify a dynamic model with lags of $(1-L)\text{Log}(y_t)$ and lags of $(1-L)x_t$ (no contemporaneous values of $(1-L)x_t$). This what SW calls ADL(p,q) model. Indicate how the model specification has been done: (i) Information Criteria or (ii) General to Particular with F-tests by pairs or any other way. The goal is to conclude with a Granger causality test. Notice that the errors have to be white noise. **[2 points]**

In E-views this can be done via ARDL in Estimation with dly and dx(-1) so no contemporaneous dx appears in the regression. Use an IC and check errors are white noise (otherwise consistency is lost). In any case use HAC robust coef tests. Test for Granger causality by testing via Wald test that the coefficients of the lags of dx are zero.

- Compare forecast ability of the previous distributed lag model DL with the best univariate model you obtained in Empirical Project I. Divide the sample into estimation part (120 observations) and forecasting part (the rest). Provide a conclusion via Diebold-Mariano test. **[2 points]**
- Specify and estimate what SW denominates a distributed lag model DL (now with contemporaneous $(1-L)x_t$ BUT no lags of dly) and provide: impact multiplier, long run multiplier (is it zero? This can be tested by regressing $(1-L)\text{Log}(y_t)$ on a constant, $(1-L)(1-L)x_t$, $(1-L)(1-L)x_{t-1} + \dots + (1-L)x_{t-k}$...the last coeff is the long-run multiplier (is it significant? Which is its sign?), and the median lag. **[2 points]**

In EViews this is done via OLS regression estimation (IC or General to Particular).

- Final part of the project will consist on testing for unit roots and if so for cointegration (simple Engle-Granger procedure). If there is cointegration then estimate a single equation error correction model (ECM) where the ADL is in levels. If this has not been taught in class then specify how you should have modified the ARDL (with contemporaneous X_t) to get a balanced regression model. If the variables are NOT cointegrated but have a unit root, estimate an ECM in first differences. **[2 points] (this part substitutes the original part)**
- Write a short (5 lines) conclusion on the effectiveness of the monetary policy (goal of the project). **[2 points]**

Of course, do not forget the name of the members of the team, country, variables, sample period, etc.