

Assignment 5
International Macroeconomics
Fall 2007
Professor M. Uribe
Duke University
Due November 12

The purpose of this homework is to gauge the importance of terms of trade (TOT) shocks in driving business cycles in Argentina during the period 1900-2005, and to ascertain whether the RBC model can account for the effects of TOT shocks on macroeconomic variables of interest.

1. Using the data contained in the file hwk5_07fall.xls, estimate a VAR system of the form $AX_t = BX_{t-1} + \epsilon_t$, where the vector X_t contains, in this order, the logarithms of the terms of trade, output, consumption, investment, and the level of the trade-balance-to-output ratio. In the estimation, include a quadratic trend (i.e., include t and t^2 as regressors).
2. To identify TOT shocks, assume that TOT are exogenous to Argentina.
3. Calculate the fraction of the variances of the variables contained in X_t attributable to TOT shocks. Discuss.
4. Plot (using 5 subplots arranged in 3 rows and 2 columns) the impulse response function (IRF) of all the components of X_t to a one-percent positive deviation of TOT from trend. Allow for 10 periods. In the graph, include a two-standard-error band around the point estimate. To construct this band you can use either the delta method or a bootstrapping method. Make a table displaying the numerical values of the IRFs for the TA to check. Discuss the empirical results.
5. Now produce theoretical IRFs. To this end, use the small-open-economy RBC model with a debt-elastic interest rate discussed in class. Interpret the productivity shock as a TOT shock. As a process for the TOT shock, use the first equation of the your estimated VAR system. Use as a basis the calibration from SGU (JIE, 2003) but alter the coefficient ϕ governing capital adjustment costs to make the initial response of investment to a TOT shock the same in the theoretical and empirical models. Report the estimated value of ϕ . How does it compare to the one used by SGU. What explains the difference?
6. Make a plot displaying the empirical IRFs, the theoretical IRFs, and the standard-error bands (again, use the 3×2 subplot arrangement). Discuss the performance of the theoretical model. Make a table containing the numerical values of the IRFs, for the TA's use.