International Trade
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International Trade and Payments Theory (8403)

Spring 2012, Mini 1

Problem set 1

Due Friday, Feb. 3, in class. Important total output for the problem set should not exceed 7 pages.

Part 1

Obtain data from the OECD national quarterly accounts and Main Economic Indicators for quarterly GDP, consumption (including private and public), investment (gross capital formation), exports, imports, terms of trade and civilian employment for United States, Japan, Canada, UK, France and Italy for the period 1984.1 and 2011.4. (or the latest period you can get). Obtain real exchange rate data (for the same period) from the IMF international financial statistics. Compute the statistics reported in panels A & B and last two columns of panel C of table 2 in Heathcote and Perri, 2002 for each country. In addition report correlation of labor productivity (i.e. GDP divided by employment) and GDP. Briefly comment on whether the business cycles look similar across these countries.

Compute pairwise correlations of output, consumption, investment and employment and report mean and medians of these correlations. Report how these mean and medians correlations change when you exclude the Great Recession period (i.e. if you restrict the sample to 1984.1-2007.1)

Repeat the exercise above adding a variable that measure the value of the stock market for every country (you can obtain the data from MSCI Barra or from the OECD main economic indicators). In particular compute stock market volatility (relative to GDP) and domestic and international co-movements of the stock market. Also compare the cross sectional dispersion of the stock market performance with the cross sectional dispersion of GDP. All your output for this part should be contained in 3 pages.

Part 2

Solve the model in Heathcote and Perri (in complete markets, bond economy and financial autarky) using a package of your choice. Set the parameters to the benchmark in the paper (or change them if you like) and produce business cycle statistics comparable to the data you have computed in part 1. Write 1 page highlighting success and failures of the model and explain why it is so. How does the model do in replicating the correlation between labor and productivity.

Part 3

Now assume that while consumption is produced using the aggregate between good a and b, investment is produced using only the local good. Recalibrate the ω in the aggregator to get the same trade share as in the benchmark version and otherwise leave all other parameters the same. Recompute business cycle statistics and assess what is the major impact of this modelling change. Output of this part should be contained in 1 page.

Part 4

Suppose you'd want to use the model above to talk about stock markets and how their fluctuations affect business cycles. What is the equivalent of the stock market value in the model? Using the benchmark parameters assess how well the model does in terms of stock market variables (Also describe how you compute stock market values in the various market structures of the model). Suppose that now depreciation of capital in each country is stochastic instead of deterministic. Let δ_{it} be the deviation of the depreciation rate from its steady state level and have it follow

$$\begin{aligned} \delta_{it} &= 0.95\delta_{it-1} + \varepsilon_{it} \\ \begin{bmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \end{bmatrix} &\rightarrow N(0, \Sigma) \end{aligned}$$

Assume Σ is symmetric and pick variance and correlation so that that the model matches the average volatility of stock markets relative to GDP and average comovement. Assess how the model with these additional shocks does in matching business cycles. (2 pages)

Part 5

Now suppose you want to use the model to assess its ability to explain international co-movement during the great recession. Focus on two countries (for example US and Germany). Feed the model the realizations of TFP shocks so that TFP in the model matches TFP in the data in US and Germany. Plot GDP (log deviations from HP trend) in the model and in the data for US and Germany. Comment.