

University of Pittsburgh
Spring 2015 Economics 2510
International Finance
Problem Set 1

Due Tuesday 1/27, in class.

1 Home bias in trade (35 points)

Consider a simple two country, two good, endowment economy. The home and foreign country is endowed with Y_H and Y_F respectively. There are iceberg transportation costs τ . Utility maximization for home and foreign agents is given by

$$\begin{aligned} \max \quad & C \equiv \left(C_H^{(\theta-1)/\theta} + C_F^{(\theta-1)/\theta} \right)^{\theta/(\theta-1)} \\ \text{s.t.} \quad & P_H C_H + P_F C_F \leq P_H Y_H \end{aligned}$$

and

$$\begin{aligned} \max \quad & \left(C_H^{*(\theta-1)/\theta} + C_F^{*(\theta-1)/\theta} \right)^{\theta/(\theta-1)} \\ \text{s.t.} \quad & P_H^* C_H^* + P_F^* C_F^* \leq P_F Y_F \end{aligned} .$$

- a) Define the competitive equilibrium of this economy.
- b) Consider the symmetric case where $Y_H = Y_F$. Derive the ratio of home expenditure on imports relative to home goods as a function of τ and θ .
- c) Now consider home bias $\omega < 1$ in preferences

$$U \equiv \left(C_H^{(\theta-1)/\theta} + \omega C_F^{(\theta-1)/\theta} \right)^{\theta/(\theta-1)}$$

and

$$U \equiv \left(\omega C_H^{*(\theta-1)/\theta} + C_F^{*(\theta-1)/\theta} \right)^{\theta/(\theta-1)}$$

Consider the symmetric case where $Y_H = Y_F$. Derive the ratio of home expenditure on imports relative to home goods as a function of ω and θ . Are the effects of home bias in preferences ($\omega < 1$) isomorphic to the effects of trade costs τ ?

2 Home bias in equity portfolio (35 points)

Consider a two-country, two-good, endowment economy. Countries are symmetric, and national endowments $s = (Y_H, Y_F)$ follow a symmetric joint distribution. There is free and costless trade in Arrow-Debreu securities, and iceberg transportation costs τ . Agents choose state-contingent consumptions C_H and C_F of the home and foreign goods to maximize

$$EU = E \left\{ \frac{1}{1-\rho} \left[\left(C_H^{(\theta-1)/\theta} + C_F^{(\theta-1)/\theta} \right)^{\theta/(\theta-1)} \right]^{1-\rho} \right\} = E \frac{C^{1-\rho}}{1-\rho}.$$

- a) Define the competitive equilibrium of this economy.
- b) Derive the conditions which characterize C_H, C_F, C_H^*, C_F^* for every state s .
- c) Now consider the model without Arrow-Debreu securities, but with trade in equity shares to each country's output. Assume that $\rho = 1/\theta$. Show that the equity trade allocation is identical to the Arrow-Debreu allocation.

3 Data crunching (30 points)

Obtain data from the OECD quarterly national accounts for real GDP for some country for the period 1970Q1 to 2014Q4 (or the latest period you can get). In addition, download employment data for the same country and timeframe. Both series should be seasonally adjusted (s.a.).

- a) Using the Hodrik-Prescott(HP) filter with a smoothing parameter of 1600, obtain a trend and deviation series for GDP. Plot the time series of real GDP and the HP trend of GDP on one graph.
- b) Compute the percent deviation from trend of real GDP, i.e. $\frac{\text{deviation}_t}{\text{trend}_t} * 100$. Plot the time series.
- c) Now compute real labor productivity, that is, divide real GDP by employment. Use a smoothing parameter of 1600 to obtain a trend and deviation series for real labor productivity. Plot the time series of real labor productivity and the HP trend of real labor productivity on one graph.
- d) Compute the percent deviation from trend of labor productivity, i.e. $\frac{\text{deviation}_t}{\text{trend}_t} * 100$. Plot the time series.
- e) Now plot the time series of the percent deviations from trend of labor productivity and real GDP in one graph. Include recession bars on this graph. (Recession bars indicate the periods during which the economy is in a recession) Briefly comment on the cyclicity of the two time series.