Econ 635 Fall 2009
Problem Set 2

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November 16, 2009
Due date: November 30, 2009

Instruction: Answer 2 out of 3 questions below.

1. (20 points: money, sticky price and exchange rate)
   (a) (10 points) Consider the sticky-price two-country model discussed in class. Assume that some firms set price in buyer’s currency and some firms set price in seller’s currency. Explain the effects of a permanent increase in money supply on nominal exchange rate, real exchange rate, terms of trade and current account in the short run.
   (b) (10 points) Now assume that goods trade is subject to iceberg-type trade costs. How will your answers in part (a) change?

2. (20 points: preferences and real exchange rate)
   (a) (5 points) Suppose that the utility function depends on both consumption $c_t$ and labor supply $l_t$,
   \[
   U(c_t, l_t) = \frac{c_t^{1-\sigma}}{1-\sigma} + \frac{(1-l_t)^{1-\sigma}}{1-\sigma}.
   \]
   Assume that households face a cash-in-advance constraint and that the asset market is complete. Assume that production is linear in labor input. The source of uncertainty is in the money growth rate which influences the path of inflation. Define the utility maximization problem and derive the equilibrium real exchange rate.
   (b) (5 points) How is volatility of real exchange rate related to volatility of consumption.
   (c) (5 points) What are the effects of positive shocks on money growth rate on consumption and real exchange rate?
(d) (5 points) Now assume that the utility function is non-separable in consumption and leisure,

\[ U(c_t, l_t) = \frac{(c_t(1 - l_t))^{1-\sigma}}{1 - \sigma}. \]

How will your answers in Parts (b) and (c) change?

3. (20 points: simulation of a dynamic model) Simulate the path of real exchange rate and consumption in Parts (a)-(c) in Question 2 given the following conditions.

(a) The foreign and home central banks adopt the following interest rate rule: 
\[ \hat{i}_t = 0.8\hat{i}_{t-1} + 0.20[\hat{y}_t + 1.50E_t\hat{\pi}_{t+1}], \]
where \( \hat{i}_t \) is nominal interest rate, \( \hat{y}_t \) is output and \( \hat{\pi}_t \) is inflation. The superscript \( \hat{\cdot} \) denote deviations from the steady state.

(b) The path of inflation growth rate \( \hat{\pi}_t \) tracks the path of money supply growth rate \( \hat{\mu}_t \).

(c) Money supply growth rate follows the AR(1) process: 
\[ \hat{\mu}_t = 0.50\hat{\mu}_{t-1} + v_t, \]
where \( v_t \) follows \( N(0, 0.01^2) \).

(d) Intertemporal elasticity of substitution \( \sigma \) is 5.

(e) Home and foreign economy have symmetric size.