SIMON FRASER UNIVERSITY
Department of Economics

Econ 842 — Prof. Kasa
International Monetary Economics — Spring 2017

MIDTERM EXAM
(March 6)

Answer the following questions True, False, or Uncertain. Briefly explain your answers. (10 points each).

1. Increased government spending causes current account deficits.
2. According to Uncovered Interest Parity, exchange rates should be unpredictable.
3. Rapid productivity growth causes the real exchange rate to appreciate.
4. With complete markets, current accounts are always in balance.

The following questions are short answer. Briefly explain your answer. Clarity will be rewarded.

5. (30 points). In most developed countries, the current account surplus (CA) and detrended GNP (Y) have a negative covariance, $\text{cov}(CA, Y) < 0$. In addition, the variance of detrended consumption is less than the variance of detrended GNP, $\text{var}(C) < \text{var}(Y)$.

   (a) Prove that these two empirical observations cannot be explained in a model that does not incorporate government spending or investment.

   (b) Consider a small open-economy that can borrow and lend at constant (gross) world interest rate R. This real non-state-contingent bond is the only traded asset. A representative household maximizes expected discounted utility, with discount factor β, where $\beta R = 1$. The household produces output using capital according to the production function, $Y_t = A_t F(K_t)$, where $F' > 0$ and $F'' < 0$. Productivity, A_t, is an exogenous random variable. Households can augment the capital stock by using some output for investment, but there is a one-period installation lag, so that $K_{t+1} = K_t + I_t$. (Note for simplicity, capital is assumed not to depreciate).

      (i) Suppose first that A_t is i.i.d. (ie., productivity shocks are purely temporary). Let $\bar{A}$ be the mean of A_t. Assume there is a positive productivity shock at time-t, (ie., $A_t > \bar{A}$). Explain how time-t consumption and investment respond. What happens to the current account at time-t?

      (ii) Now suppose that productivity shocks are permanent, so that $A_{t+1} = \bar{A} + A_t + \varepsilon_{t+1}$, where ε_{t+1} is mean-zero and i.i.d. (Ignore the fact that this permits negative productivity with some positive probability). Again assume that there is a positive productivity shock at time-t. Explain how time-t consumption and investment respond in this case. What happens to the current account?

   (c) Do either of these two examples explain the empirical facts described in part (a)?

6. (30 points). This question is based on the monetary model of exchange rate determination. Equilibrium in the domestic and foreign money markets is given by (with all variables in logs, except the interest rate).

$$\begin{aligned} m_t - p_t &= \phi y_t - \lambda i_t \\ m_t^* - p_t^* &= \phi y_t^* - \lambda i_t^* \end{aligned}$$

where ϕ is the income elasticity of money demand and λ is the interest rate semi-elasticity of money demand. Money demand parameters are identical across countries.

International capital market equilibrium is given by uncovered interest parity:

$$i_t - i_t^* = E_t s_{t+1} - s_t$$

where $E_t s_{t+1}$ is the expectation at time-t of the exchange rate in period $t+1$.

Price levels and the exchange rate are related through purchasing-power parity:

$$s_t = p_t - p_t^*$$

Define $f_t = (m_t - m_t^*) - \phi(y_t - y_t^*)$ as the economic fundamentals.

(a) Derive a first-order stochastic difference equation for the equilibrium exchange rate, s_t.

(b) Find the fundamentals (no bubbles) solution. What is the condition for this solution to hold?

(c) Suppose fundamentals are governed by the AR(1) process, $f_t = \rho f_{t-1} + \epsilon_t$, where ϵ_t is an i.i.d. shock, and $0 < \rho < 1$. Using your answer to part (b), calculate the equilibrium exchange rate when fundamentals follow this process. Show that this model cannot explain the fact that $\text{var}(s_t) > \text{var}(f_t)$.

(d) In response, some people argue that 'bubbles' are responsible for observed exchange rate volatility. In the context of this model, explain what a bubble would be. Provide an explicit expression for a bubble (ie, a time-series process). Explain how either a Hausman specification test or Shiller's variance bound could be used to test for bubbles in the foreign exchange market.