SIMON FRASER UNIVERSITY
Department of Economics

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

FINAL EXAM
(April 21)

Questions 1-4. Answer True, False, or Uncertain. Briefly explain your answer. No credit without explanation (10 points each).

1. Currency crises reflect the existence of multiple equilibria in foreign exchange markets.
2. International capital flows cause national outputs to be more highly correlated.
3. If national productivity shocks are transitory, then bond trading nearly reproduces the complete markets equilibrium.
4. China has current account surpluses because its domestic financial markets are distorted.

   The following questions are short answer. 30 points each.

5. Briefly describe the assumptions and results of the paper "International Real Business Cycles", by Backus, Kehoe and Kydland (JPE, 1992). What were its successes and failures? Describe how these failures motivated the work of Baxter and Crucini (IER, 1995). Were they able to resolve the puzzles identified by Backus, Kehoe and Kydland? Describe how the work of Baxter and Crucini motivated the work of Kehoe and Perri (Econometrica, 2002). How did their analysis and findings differ from those of Baxter and Crucini?
6. **Growth and Portfolio Diversification**. This question explores this links between growth and international capital market integration. Consider first a closed-economy, inhabited by a representative agent with the following preferences

$$U_t = \max_C E_t \sum_{s=t} \beta^{s-t} \log C_s$$

   Assume that this economy has *two* linear (ie, AK) technologies, a 'safe' technology and a 'risky' technology. For each unit invested at the beginning of the period in the safe technology, the agent receives $1+A$ units of goods at the end of the period. Hence, by no arbitrage, we know that the riskless rate of interest in this economy will be, $1+r = 1+A$. In contrast, for each unit invested at time-t in the risky technology the agent receives a random rate of return $1+\tilde{r}_t$. For simplicity, assume that $\tilde{r}_t$ is i.i.d. Of course, since the agent is risk averse, for this investment to be at all tempting, we must assume $E_t\tilde{r}_t > r$. Given these two investment options, the agent's budget constraint is:

$$K_{t+1} = [x_t(1+\tilde{r}_t) + (1-x_t)(1+r)]K_t - C_t \tag{1}$$

   where x_t is the share of his portfolio invested in the risky technology, and K_t represents total (ie, safe and risky) beginning of period capital. (Note, consumption takes place at the end of the period, after investment returns are realized).

Proceeding in the usual way, one can show that optimal investment is characterized by the following two Euler equations:

$$1 = \beta(1+r)E_t\left(\frac{C_t}{C_{t+1}}\right) \quad (2)$$

$$1 = \beta E_t\left((1+\tilde{r}_{t+1})\frac{C_t}{C_{t+1}}\right) \quad (3)$$

Exploiting the fact that the utility function is logarithmic and returns are i.i.d., we can combine these with the budget constraint to get the following optimal consumption function:

$$C_t = (1-\beta)[x_t(1+\tilde{r}_t) + (1-x_t)(1+r)]K_t \quad (4)$$

(a) Linearize the two first-order conditions in (2) and (3) to obtain an expression for $E_t\tilde{r}_{t+1}$ in terms of r, β, and $\text{cov}_t(C_{t+1}/C_t, \tilde{r}_{t+1} - r)$.

(b) Notice that by combining equations (4) and (1) we have

$$\frac{C_{t+1}}{C_t} = \beta[1 + r + x(\tilde{r}_{t+1} - r)]$$

Notice that growth is increasing in the share allocated to the risky technology. (Note, we can drop the time subscript on x, since with i.i.d returns, the portfolio shares will be constant). Use this result, along with your answer to part (a) to prove that the optimal share in the risky technology is

$$x = \frac{E_t(\tilde{r}_{t+1} - r)}{\beta^2(1+r)\text{var}_t(\tilde{r}_{t+1} - r)}$$

(c) Now consider a global economy, consisting of many identical countries, just like the one you just analyzed. The only difference between them is that the returns on their risky technologies are uncorrelated (although the mean returns are the same). With identical preferences and open capital markets, all investors will invest in an identical global mutual fund, consisting of an equally weighted share of all countries' risky technologies. Suppose there are N countries in the world. What is the variance of this global mutual fund, relative to the variance of the return on an individual country's risky technology?

(d) Derive an expression for each country's equilibrium growth rate as a function of N. Explain intuitively what is going on here. Discuss the implications for measuring the gains from international portfolio diversification.