Final Exam, May 3—5 questions, total weight is 100%, all sub-questions carry equal weight.

1. (12%) a) Derive the Keynesian AD curve.

b) Give *one* explanation for why the AS curve may be sloping the way it does. Be specific about why your explanation leads to this AS-curve.

c) Show what happens to the AS/AD curves when government consumption increases (with fixed taxes).

2. (12%) Assume that income follows the ARMA process

$$y_t = 3 + 0.3y_{t-1} + e_t$$

where e_t is white noise.

a) Is this time-series process stable?

b) What is $E_{t-2}y_t$ if $y_{t-2} = 5$ and $y_{t-3} = 10$?

3. (35%) Consider the case of the 2 agents, 2 periods, 2 states-of-the-world model of Obstfeld-Rogoff Chapter 5.2 (where agents can trade using a full set of Arrow securities). Assume that both agents have quadratic utility functions $U(C_0) + E_0U(C_1)$, where $U(C_t) = aC_t + bC_t^2$. Assume that $a = 10$ and $b = -0.5$.

Assume that the endowment of the first agent is $y_0 = 2, y_1 = 2$ and that the endowment of the second agent in period 0 is $y_0^* = 2$ and in period 1 his or her endowment is $y_1^* = 4$ in the "good state" g. In the "bad state" b the endowment of the second agent is $y_1^* = 4/3$. Assume that the good state happens with probability 0.25.

a) Find the price of the Arrow securities for state g and state b.

b) Explain intuitively why the price of the Arrow security for one of the states may be higher than for the other state. You need to give two reasons and explain the logic.

c) Find the safe rate of interest.

d) Assume that the agents now DO NOT have access to Arrow securities but that they have access to a risk-less bond. Continue assuming that the two agents make up the world. Find the amount of the bond purchased or sold in period 1 by each of the agents and the rate of interest. (Ignore non-negativity constraints for consumption if you encounter any.)

e) Explain the logic of the answer in d) [even if you didn't solve d)]. You need to explain the logic of why the rate of interest will be positive/negative. (Hint: The answer in this case with a quadratic utility function is different from the one you get with a CRRA utility function.)

Please turn over

4. (21%) a) Derive the Consumption CAPM (C-CAPM).

b) Assume that Asset A and asset B exist for one period and their pay-offs have identical variances. The pay-off of asset B has a covariance with the growth rate of consumption that is twice as large as the covariance of the pay-off of asset A with the growth rate of consumption. Which asset will—if the C-CAPM holds—have the highest expected rate of return?

5. (20%) a) Explain the Campbell-Mankiw "rule-of-thumb" consumer model.

b) Explain how the model can be estimated using instrumental variables estimation.