Final Exam, May 4 — 5 questions. All sub-questions carry equal weight except when stated.

1. (10%) Assume that income follows the AR(2) process

$$y_t = 3 + 1.5y_{t-1} + 0.5y_{t-2} + e_t \quad (*)$$

where e_t is white noise.

What is $E_1 y_3$ if $y_1 = 4$ and $y_0 = 2$? (Note, the time indices are 0, 1, and 3).

2. (20%) Consider the Lucas imperfect information model.
Assume that shock to individual demand (z_i in the text) have a variance σ_z^2. Now assume that demand follow one of the two following models

$$m_t = 1 + .2m_{t-1} + u_t \; ; \; var(u_t) = 4 \, , \; (A)$$

or

$$m_t = 3 + .6m_{t-1} + u_t \; ; \; var(u_t) = 2 \, . \; (B)$$

(The process for individual demand is the same in both cases.) Assume that agents observe m_{t-1} before making decisions in period t; i.e., at time t m_{t-1} is given. Then assume that the shock u_t takes the value 1. Now would the impact of the shock be larger if monetary policy is described by model A or by model B. (Explain the logic of your answer).

3. (40%) Assume that 2 agents (or countries) live for 2 periods in an economy with perfect Arrow-Debreu markets and no storage. Assume that the endowment of the first agent is $y_0 = 3$, $y_1 = 5$ in state A and $y_1 = 1$ in state B. The endowment of the second agent in period 0 is $y_0^* = 3$ and in period 1 his or her endowment is $y_1^* = 4$ in state "A." In the state "B" the endowment of the second agent is $y_1^* = 2$. Assume that state A happens with probability 1/3.
Assume each agent maximizes a utility function

$$\log(C_0) + E_0 \log(C_1) \, .$$

a) (20%) Find the consumption of both agents in both periods and in both states of the world.
b) (10%) Does one agent consume more than the other? Explain the intuition for why.
c) (10%) Find the rate of interest. Explain intuitively why it is negative or positive.

PLEASE TURN OVER

4. (20%) Consider the PIH model with an interest rate of 10 percent. a) Assume that a consumer's income follows the AR(2) process

$$y_t = 2 + 0.5y_{t-1} + 0.3y_{t-2} + e_t \quad (*)$$

where e_t is white noise with variance 3.

If $y_t = 4$, $y_{t-1} = 2$, and $y_{t-2} = 1$ what is $c_t - c_{t-1}$?

b) Assume that a consumer's income follows the ARMA(2,1) process

$$y_t = 2 + 0.5y_{t-1} + 0.3y_{t-2} + e_t + e_{t-1} \quad (*)$$

where e_t is white noise with variance 3.

If $y_t = 4$, $y_{t-1} = 2$, $e_{t-1} = 1$, and $y_{t-2} = 1$ what is $c_t - c_{t-1}$?

5. (10%) Explain what is meant by "Home Bias" in international portfolio holdings. (You need to be explicit about what the empirical issue is and the theoretical reason for why it is referred to as "bias.")