ECONOMICS 7344, Spring 2007
Bent E. Sørensen
February 22, 2007

Midterm Exam 1, February 26—4 questions. All sub-questions carry equal weight.

1. (24%) Assume that y_t follows the AR(1) process

$$y_t = 200 + 0.8y_{t-1} + e_t \quad (*)$$

where e_t is white noise with variance 3.
a) Is this time-series process stable?
b) Find the mean and variance of y_t assuming that y_t is stationary.

Now assume $y_1 = 210$ and $y_0 = 200$ (which implies the time series is no longer stationary).
c) What is the conditional expectation $E(y_2|y_1)$?
d) What is the conditional expectation $E(y_2|y_0)$?

2. (30%) Assume the output in an economy is determined by the equilibrium condition that aggregate demand E is equal to total output Y. Assume that $E = C + I + G$ where consumption $C = 2 + .5 * (Y - T)$ (T is net taxes), investment $I = 1 - 0.2 * r$ (r is the real interest rate), and government consumption is exogenous at 2. T equals 2. Assume that inflation and expected inflation is 0 and that $P = 1$. Money supply is exogenous at 10, and the demand for money is $P * L(Y, r)$ where $L(Y, r) = Y - 0.1 * r$.
a) Derive the IS curve.
b) Derive the MP-curve (in Romer's notation) (equivalent to the LM curve here where inflation is 0).
c) Solve the model for the equilibrium level of output and interest rates.
d) Solve the model for $P = 0.5$ and $P = 2$.
e) Sketch the AD-curve.

3. (24%) In the imperfect competition model the level of output was found to be

$$(\frac{\eta - 1}{\eta})^{\frac{1}{\gamma - 1}} ,$$

using the notation from the book.
a) What is the interpretation/definition of η and γ.
b) Is the level of output increasing with η and with γ?
c) Explain intuitively your answers in part b).
d) Is the level of output equal to, higher, or lower than in the perfect information case? Explain your answer intuitively. (What is the logic, not the technical derivations.)

PLEASE TURN OVER

4. (22%) a) Describe the price setting assumptions in the Fischer model (write down the equations).
b) The solution for output is linear in m_t, $E_{t-1}m_t$, and $E_{t-2}m_t$. What is the coefficient to m_t? Explain the logic of your answer (this can, and should, be done precisely).
c) Explain what point(s) Fischer was making about rational expectations models. (You don't need to mention all the details from the book, but you need to get the main point across.)