

Dynamic Microeconomics. Midterm October 17, 2011.

(All questions have weight 20%.)

1. Explain (5-10 lines) the intuition of each of the two models Paul Romer suggested to endogenize steady state technological progress.
2. Assume $Ef(x_t, \theta)$ is a vector moment condition which has expectation 0 for $\theta = \theta_0$ and you have observations x_1, \dots, x_T .
 - a) Explain how the GMM estimator works.
 - b) Outline the Bartlett/Newey-West/"tent" estimator of the optimal weighting matrix.
3. In an optimal search model where an unemployed person who gets a job, stays on the job forever, receiving consumption w in each period and with a utility cost of effort, show the first order condition that pins down the agent's search effort.
4. Assume that there are two states of the world and a consumer has utility 1 in the first state of the world and 3 in the second state of the world.
Find the expected value of $\sum_{t=0}^{\infty} \beta^t u(c_t)$ given a discount factor $\beta = .5$, initial probabilities $\pi'_0 = (.3, .7)$, and a transition matrix P which is equal to the identity matrix I .
5. Bellman equations.
 - a) Write down the Bellman equation. (Explain the definition of all terms.)
 - b) State (best to derive) the Benveniste-Scheinkman equation (assuming all functions are differentiable).
 - c) Find the Euler equation implied by the Bellman equation and the Benveniste-Scheinkman formula under a certain assumption (explain which).