Professor Salyer, Economics 137, Fall 2007

Second Midterm Exam

Directions: Answer all questions - they are weighted equally. Remember, to receive full credit you must provide ***complete explanations*** *for your answers. Relax and Good Luck.*

1. Within the context of the Lucas Imperfect Information model, answer the following

   (a) It was assumed that agents in the model formed expectations rationally. This implied that they knew that the aggregate price level, p, was distributed normally with mean of μ_p and variance of σ_p^2 while the relative price of good i, r_i, was distributed normally with mean of 0 and variance of σ_r^2. Furthermore, it was known that p and r_i were independently distributed. Derive the implied mean and variance of the price of good i, that is, p_i.

   (b) At the core of the model is a signal extraction problem. Describe the nature of this problem and how its solution determines the slope of the aggregate supply curve.

   (c) What are the exogenous sources of uncertainty in the model?

2. When Lucas won the Nobel prize, the press release stated that, "Lucas was able to explain why the Phillips curve appeared to have so much empirical support, he could also show that any attempt to exploit the Phillips curve and permanently increase employment by systematically creating higher inflation would be futile." What does this mean?

3. Again quoting for the press release announcing Lucas's Nobel prize: "The fate of the Phillips curve demonstrates the dangers in uncritically using a statistical relationship to draw economic-policy conclusions. The insights into these dangers were developed further in the so-called Lucas Critique." Explain what this means; in particular, discuss the insights that were developed in the Lucas Critique.

4. The following questions are drawn from the Lucas Critique model:

   (a) In deriving the investment demand function associated with a hypothetical industry, Lucas derived the following necessary condition:

   $$\left(1-\psi_t\right)=\left(\frac{1}{1+r}\right)\left\{\lambda\left(1-\theta\right)E_t\left(p_{t+1}\right)+\theta\delta+\left(1-\delta\right)\left[1-E_t\left(\psi_{t+1}\right)\right]\right\}$$

   Interpret this expression in terms of marginal cost = marginal benefit; identify the role of each term in the expression.

   (b) Lucas criticizes Hall and Jorgenson's econometric analysis of the effects of an investment tax credit on investment demand. What is the nature of Lucas's criticism? In your discussion, use the above necessary condition to support your argument.