Economics 202A Final Exam
December 16, 2008

Instructions: You have 2 hours, 15 minutes. Answer all questions; their values are listed. Take the first 5 minutes to look over the entire exam before you start. That way you can better pace yourself. If you get stuck, go on to something you can answer more easily and return to the difficult bits later on. Good luck, and happy holidays!

1. (22 points) Explain the distinction between endogenous economic growth and exogenous economic growth. Briefly sketch a model of endogenous economic growth, and give a concrete example of a policy action by the government that affects the rate of economic growth in your chosen model.

2. (a) (22 points) Use the Barro-Gordon model of dynamic inconsistency in monetary policy to explain how a government's inability to commit to a monetary-policy rule may land it in an equilibrium where *expected* inflation is high relative to the government's preferred rate.

(b) (12 points; *this question requires no math – just words, please.*) In a world where bank runs are possible, such as the Diamond-Dybvig model's world, the central bank of the economy can prevent bank runs by acting as a lender of last resort (LLR) to the private banking system. But if everyone knows the central bank will behave in this way, moral hazard will arise – lenders to the banks will not monitor its management, and the banks themselves will engage in excessively risky behaviors. In your opinion, is it dynamically consistent for the central bank to announce to the public that it will *not* step in as an LLR if banks get into trouble? Explain. What would the Nash equilibrium look like if the central bank exercises discretion, if people know it has LLR capabilities, and if no regulatory restrictions are placed on the behavior of private banks?

3. (22 points) Derive the q model of investment, including the associated phase diagram. Then show how q and K adjust to (a) an unanticipated permanent rise in the real interest rate r and (b) an anticipated future *temporary* rise in the real interest rate r.

4. (22 points) Suppose we have a quadratic utility function

$$u(c_t) = ac_t - \frac{b}{2}c_t^2$$

and that the consumer maximizes

$$\mathbb{E}_0\left\{\sum_{t=0}^{\infty} \beta^t u(c_t)\right\}$$

where the real interest rate r is constant and $\beta(1+r) = 1$. The intertemporal budget constraint is

$$\sum_{t=0}^{\infty} \frac{c_t}{(1+r)^t} = \sum_{t=0}^{\infty} \frac{w_t}{(1+r)^t},$$

where w_t is labor income on date t. Above, I have assumed that the initial assets are $a_0 = 0$.

(a) Derive the certainty equivalent consumption function

$$c_0 = \frac{r}{1+r}\mathbb{E}_0 \sum_{t=0}^{\infty} \frac{w_t}{(1+r)^t}.$$

(b) Suppose labor income follows the autoregressive process

$$w_t = \rho w_{t-1} + \varepsilon_t$$

where $\mathbb{E}_{t-1}\varepsilon_t = 0$ and $0 \leq \rho \leq 1$. Solve for c_0 in terms of w_0, r, and ρ.

(c) Use your consumption function to solve for the (unconditional) variance of c_0, $\text{Var}(c_0)$, as a function of $\text{Var}(w_0)$.

(d) Can you show that for $\rho < 1$, $\text{Var}(c_0) < \text{Var}(w_0)$? Interpret this inequality.

(e) What happens when $\rho = 1$?