

Econ 101b Spring 2008 Practice "Applications" Exam.

Do three of the four questions ...

1. Moral Hazard: Suppose that the demand for mortgage loans by "good borrowers" is given by:

$$D = 80000(0.1 - r)$$

where D is total demand in billions of dollars and an r of 5% means $r=0.05$. Suppose further that the demand for mortgage loans by "bad borrowers" is simply some parameter y . Banks earn a net rate of interest of 0 on the loans they make to bad borrowers. Banks earn the posted rate of interest on the loans they make to good borrowers. Assume that the banking industry is competitive: banks make loans at a posted interest rate that gives them an average return equal to their cost of funds.

- Suppose $y = 4000$ and the cost of funds to banks is perfectly elastic at 1%. What volume of loans are made in equilibrium? How many go to good borrowers? How many to bad borrowers?
- Suppose $y = 4000$ and the cost of funds to banks is perfectly elastic at 2%. What volume of loans are made in equilibrium? How many go to good borrowers? How many to bad borrowers?
- Suppose $y = 4000$ and the cost of funds to banks is perfectly elastic at 3%. What volume of loans are made in equilibrium? How many go to good borrowers? How many to bad borrowers?
- Suppose $y = 4000$ and there is one monopoly bank with a cost of funds of 2%. What is its profit-maximizing strategy?

2. International Finance: Start with the consensus international business cycle model, in differences form:

$$\Delta Y = \Delta C + \Delta I + \Delta G + \Delta GX - \Delta IM$$

$$\Delta C = (0.75)(1 - 1/3)\Delta Y$$

$$\Delta I = -2000\Delta r$$

$$\Delta G = 0$$

$$\Delta GX = 100\Delta \epsilon$$

$$\Delta IM = 0.1\Delta Y$$

$$\Delta \epsilon = \Delta \epsilon_0 - 10\Delta r$$

- Suppose that in the flexible-price version of the model—with Y fixed at potential output—foreign exchange speculators panic and the price of foreign currency ϵ jumps upward by an amount $\Delta \epsilon_0$. Solve for the changes in all the other variables of the model.
- Suppose that we are in the sticky-price version of the model where the Federal Reserve sets the real interest rate r . What would you advise the Federal Reserve to do in the event of a panic that causes an upward jump in the price of foreign currency ϵ jumps upward by an amount $\Delta \epsilon_0$ as in part a above? Why?

3. Financial Crises: Start with the international business cycle model, in differences form:

$$\Delta Y = \Delta C + \Delta I + \Delta G + \Delta GX - \Delta IM$$

$$\Delta C = (0.75)(1 - 1/3)\Delta Y$$

$$\Delta I = -2000\Delta r - 10\chi$$

$$\Delta G = 0$$

$$\Delta GX = 100\Delta \varepsilon$$

$$\Delta IM = 0.1\Delta Y$$

$$\Delta \varepsilon = \Delta \varepsilon_0 - 10\Delta r$$

$$\chi = \phi(\Delta \varepsilon)^2$$

where χ is the intensity of financial crisis, determined by the square of the upward jump in the price of foreign currency do to mismatch (i.e., banks that have loaned at home but borrowed abroad in foreign currency) and the parameter ϕ .

- Suppose that there is a collapse of confidence by foreign exchange speculators that makes $\Delta \varepsilon_0 = 0.5$, with $\phi = 15$. What happens—in flexible and in sticky-price situations?
- Suppose that there is a collapse of confidence by foreign exchange speculators that makes $\Delta \varepsilon_0 = 0.5$, with $\phi = 20$. What happens—in flexible and in sticky-price situations?
- Suppose that there is a collapse of confidence by foreign exchange speculators that makes $\Delta \varepsilon_0 = 0.5$, with $\phi = 25$. What happens—in flexible and in sticky-price situations?

4. Long-Run Growth: Remember our Solow growth model:

$$Y_t = K_t^\alpha L_t^{1-\alpha} E_t^{1-\alpha} \quad \text{steady - state growth capital -}$$

$$\frac{d}{dt} \ln(L_t) = n \quad \text{output ratio :}$$

$$\frac{d}{dt} \ln(E_t) = g \quad \kappa^* = \left(\frac{K_t}{Y_t} \right)^* = \frac{s}{n + g + \delta}$$

$$\frac{d}{dt} \ln(K_t) = sY_t - \delta K_t \quad \text{net rate of return :}$$

$$r = \frac{\partial Y_t}{\partial K_t} - \delta$$

- Suppose that the economy is on its steady-state growth path with $\alpha = 1/3$, $\delta = 0.03$, $n = 0.01$, $g = 0.02$, and $s = 20\%$. Calculate the net rate of return on investment. Is the savings rate “too high” according to the Golden Rule? Is the savings rate not high enough? What kind of surplus or deficit would you recommend that the government run?
- Suppose that the economy is on its steady-state growth path with $\alpha = 1/3$, $\delta = 0.03$, $n = 0.01$, $g = 0.02$, and $s = 40\%$. Calculate the net rate of return on investment. Is the savings rate “too high” according to the Golden Rule? Is the savings rate not high enough? What kind of surplus or deficit would you recommend that the government run?
- If the savings rate is below the “Golden Rule” value, how would you go about figuring out how far and fast the savings rate should be raised?