Econ 3302
Dr. Balke

Final Exam

Directions: Answer every question. Be sure to label your diagrams and to budget your time efficiently. Good luck.

1. (10 points) Briefly explain how the increased use of securitization, the rise of the "shadow" banking system in which "banks" used of nontraditional instruments such as "repos" to obtain funds (borrow), coupled with the decline in house prices resulted in the financial crisis of 2008. What actions did the Fed take during 2008 in response to this "crisis"?

2. Consider the following modified Solow Growth model.

   Economy wide production function is:

   $$Y = f(L,K),$$

   where Y is output (GDP), K is the stock of capital and L is labor input. Assume that the production function is characterized by constant returns to scale. Both the marginal products of labor and capital are diminishing.

   Assume that population (L) is growing over time at the rate n.

   The capital-labor ratio evolves over time according to:

   $$\Delta\left(\frac{K}{L}\right) = \frac{I}{L} - (\delta + n)\frac{K}{L},$$

   where $\Delta\left(\frac{K}{L}\right)$ in the change in the capital-labor ratio, $\frac{I}{L}$ is investment per capita, and δ is the depreciation rate. Total savings in the economy is given by

   $$S = sY,$$

   where s is the marginal propensity to save (or the savings rate). In equilibrium, total investment expenditures, I, equals total savings, S.

   a) (3 points) Using a diagram show the steady state level of the capital-labor ratio. What is the growth rate of GDP per capita $\left(\frac{Y}{L}\right)$ in the steady state? What is the growth rate of GDP (Y) in the long-run?

   b) (7 points) Suppose that the plague strikes, killing a substantial portion of the current population (but not altering the long-run growth rate in the population). Show this effect in the context of the above Solow growth model. What happens to the current level of per capita GDP? What happens to the steady level of per capita GDP? What happens to the growth rate in per capita GDP in the long run? What happens to the growth rate in GDP in the long run?

3. (10 points) Consider a closed economy. Assume that all prices in the economy are perfectly flexible and that all markets are in equilibrium. Assume that money demand is negatively

related to the nominal interest rate. Consumption depends on current disposable income, expected future disposable income, and the real interest rate. Furthermore, the marginal product of labor depends positively on the amount of capital used and the marginal product of capital depends positively on the amount of labor used.

Speculate on what would happen to equilibrium real wages, real interest rate, aggregate output, aggregate consumption, aggregate investment, and the price level if the following events occur. Be sure to provide a thorough explanation for why you make the prediction you do.

a. The money supply increases.

b. Taxes on capital income in the future are expected to rise, but taxes on labor income in the future are expected to fall so that the total tax burden in unchanged.

4. (10 points) Consider a small open economy. Assume that all prices in the economy are perfectly flexible and that all markets are in equilibrium. Assume that money demand is negatively related to the nominal interest rate. Consumption depends on current and future disposable income and the real interest rate. Furthermore, the marginal product of labor depends positively on the amount of capital used and the marginal product of capital depends positively on the amount of labor used. Also, net-exports depends negatively on the real exchange rate.

Speculate on what would happen to equilibrium output, price level, investment, net capital flows (CF), real exchange rate, nominal exchange rate if:

a. A breakthrough in computer technology dramatically increased the productivity of labor and capital throughout the domestic economy and this increase in productivity is anticipated to last into the future.

b. Government expenditures temporarily rise and taxes rise also to keep the budget balanced.

5. (10 points) Consider a large open economy. Assume that all prices in the economy are perfectly flexible and that all markets are in equilibrium. Assume that money demand is negatively related to the nominal interest rate. Consumption depends on current and future disposable income and the real interest rate. Furthermore, the marginal product of labor depends positively on the amount of capital used and the marginal product of capital depends positively on the amount of labor used. Net capital flow depends negatively on the domestic real interest rate and reflects the relative attractiveness of investing in US versus abroad. Finally, net-exports depends negatively on the real exchange rate.

   Speculate on what would happen to equilibrium output, price level, investment, net capital flows (CF), net exports, real exchange rate, nominal exchange rate if:

   a. Foreign countries dramatically increase their demand for loans as they try to increase their capital stocks.

   b. There is a freak drought in the Midwest causing grain harvests to be unusually low..

6. (10 points) Consider a closed economy. Assume that goods prices in are sticky and that firms produce to meet demand. Assume that money demand is negatively related to the nominal interest rate and positively related to output. Consumption depends on current and future disposable income and the real interest rate.

   Speculate on what would happen to equilibrium output, price level, consumption, investment, and nominal and real interest rates if:

   a. A temporary increase in government spending occurred and this increase is financed by the government issuing debt.

   b. Household demand for money rises.

7. (10 points) Consider an **open** economy in which goods prices are flexible but nominal wages are fixed in the short run; firms determine the level of employment. Assume that money demand depends negatively on the nominal interest rate and positively on output. Consumption depends on current and future disposable income and the real interest rate.

   Speculate on what would happen to equilibrium output, price level, nominal and real wages, real interest rates, net capital flows, net exports, and nominal and real exchange rates if:

   a. There is a dramatic increase in the amount of foreign savings.

   b. There is a one-time increase in money supply that was anticipated ahead of time, i.e. workers expected the increase in money supply at the time that nominal wages were set.

8. (10 points) Consider a closed economy in which goods prices and wages are flexible but workers do not know the true price. They base their labor supply decision on expected real wage. Assume also that the labor supply curve is upward sloping. Assume that money demand depends negatively on the nominal interest rate and positively on output. Consumption depends on current and future disposable income and the real interest rate.

   Speculate on what would happen to equilibrium output, price level, nominal and real wages, consumption, investment, and real interest rates if:

   a. Expected future inflation rises (but not expectations of the current price level).

   b. A hurricane destroys a large number of industrial plants, oil refineries, and other factories along the Gulf Coast of the United States.

9. Consider simple model where Phillips curve describes the relationship between inflation and unemployment. The Phillips curve is given by $\pi_t = \pi_t^e - \theta(u_t - u^N)$. The demand growth curve is given by: $\pi_t = DG_t + \gamma(u_t - u_{t-1})$, DG_t is the growth rate in nominal GDP. Suppose that initially expected inflation was equal to 10% ($\pi_0^e = 10\%$), actual inflation was equal to 10% ($\pi_0 = 10\%$), the unemployment rate was equal to the natural rate ($u_0 = u^N$), and the growth in nominal GDP was 10% ($DG_0 = 10\%$). Assume that the economy at been at this position for many time periods. Finally, assume people have adaptive expectations such that $\pi_t^e = \pi_{t-1}$.

   a. (5 points) On a new page in your bluebook, take almost the entire page to draw a diagram with Phillips curve and demand growth curve (DG curve) and show the initial equilibrium.

   b. (10 points) Trace out for the first four time periods the effects of the monetary authority cutting demand growth to zero and keeping it there. Be sure to draw your diagram carefully, neatness counts!

   c. (5 points) What would the inflation/unemployment outcome be if, instead of adaptive expectations, people had rational expectations and the decrease in demand growth was correctly anticipated.