Whitman College
Econ 308
Exam 1
February 17, 2012

Write all answers in your blue book. On all graphs, label your axes. **Show all of your work.** After you finish the exam, you may keep the questions. The exam ends at 2:20.

1. Consider the speech "The Federal Reserve and the Economic Recovery," that San Francisco Federal Reserve Bank President John Williams gave January 10, 2012, which you read for class.

(a) (10pts) In his speech, President Williams forecasts that the United States unemployment rate "will remain over 8% well into next year." According to Okun's Law, what would happen to real Gross Domestic Product in the U.S. in 2012 if the unemployment rate averages 8.3% in 2012? In your calculation, use the fact that the unemployment rate averaged 9.0% in 2011. Be precise in your answer and explain your work.

(b) (8pts) According to President Williams, why has the economic recovery since the 2007-2009 recession been unusually slow and weak?

2. Consider the September 7, 2011 National Public Radio interview entitled "Former FDIC Chair Sheila Bair" that you read for class.

(a) (3pts) According to Ms. Bair, what abuses occurred in the United States subprime mortgage market in the 2000's, and who was committing these abuses?

(b) (5pts) Why didn't regulators stop these abuses?

3. Consider the information in the following table for the United States economy.

| Period | Nominal Gross Domestic Product | Real Gross Domestic Product in chained 2005 dollars |
|---|---|---|
| Fourth Quarter of 2009 | $14.087 trillion | $12.813 trillion |
| Fourth Quarter of 2010 | $14.755 trillion | $13.216 trillion |
| Fourth Quarter of 2011 | $15.294 trillion | $13.422 trillion |

(a) (5pts) What was the Gross Domestic Product (GDP) price deflator in the fourth quarter of 2010?

(b) (10pts) Using the GDP deflator as the price level, what was the inflation rate between the fourth quarter of 2010 and the fourth quarter of 2011?

4. Suppose that an economy has a Cobb-Douglas production function and perfectly competitive markets.

(a) (3pts)  Draw a graph showing the real aggregate output this economy could produce at various levels of labor, assuming it has a constant quantity of capital, $K_1$.

(b) (2pts)  Define the marginal product of labor.

(c) (2pts)  Explain how to use your graph from (a) to determine the marginal product of labor at a particular quantity of labor, $L_1$.  On your graph, indicate $L_1$ and the marginal product of labor at $L_1$.

(d) (5pts) With quantity of labor on the horizontal axis and the wage on the vertical axis, derive the demand curve for labor, i.e. derive the curve that shows the highest amount that firms in this economy would be willing to pay for any particular amount of labor.   Explain your work.

For parts (e) and (f), suppose the quantity of capital increases from $K_1$ to $K_2$ with all else unchanged.

(e) (8pts)  Explain how the increase in capital affects the equilibrium wage.  In your explanation, refer to new graphs, including a graph of labor supply and labor demand.

(f) (8ts)  Explain how the increase in capital affects the equilibrium rental price of capital.   In your explanation, refer to new graphs, including a graph of capital supply and capital demand.

5. (4pts)  Why do economists use the Cobb-Douglas production function to describe the United States macroeconomy?

6.   Consider the Cobb-Douglas production function where real aggregate output Y is given by $Y = A\ K^{\alpha}L^{1-\alpha}$,  in which A=12 is a parameter measuring the productivity of the available technology, K is the amount of capital employed, L is the amount of labor employed, and $\alpha$=0.30.  Suppose that currently K=400 and L=10.  The savings rate, s, is 0.35.  The depreciation rate, $\delta$, is 0.20.  Assume that the population grows at the constant rate of n =0.01 per period.  There is no change in the production technology.  Use this information and the Solow Growth Model to answer the questions below.

(a) (3pts)  What is the current real consumption per worker ($c=C/L$)?

(b) (8pts)  What will $c$ be next period?

(b) (8pts)  What is the steady-state amount of real consumption per worker, $c^*$?

(c) (8pts)  What is the golden-rule steady-state amount of real consumption per worker, $c_{gr}^*$?