Sample Exam 1: QEII Labor Market Rescue?

It seems the people who most need an economic recovery are the last to benefit. Currently the U.S. is experiencing a slow recovery, and like the last two, a “jobless recovery.” The unemployment rate peaked at 10.1 percent in October 2009, and remained at 9.6 percent or above during all of 2010. In January 2009, Christina Romer, past Chair of the Council of Economic Advisers and Jared Bernstein forecast that the unemployment rate would not return to 5 percent until 2014! Employment only began to increase in November 2009, from a recession that ended in June 2009, and the increases since November have been small and inconsistent. The American Recovery and Reinvestment Act of February 2009 and ongoing monetary policy have been large policy actions designed to end the recession and promote a strong economic recovery. In fact, real GDP has increased since the third quarter of 2009 at annualized rates between 1.6 and 5.0 percent, averaging 2.8 percent. Given the growth of real GDP in 2009-2010, many people wonder why it takes so long to put people back to work and lower the unemployment rate.

a. Use the IS/LM model along with models of the “sticky wage” labor market including an output supply curve and the money market to analyze the effects of the monetary policy of reducing a target short term interest rate. In your analysis, start with an economy that is already in recession. Consider the effects of the monetary policy on output, employment, wages and interest rates. Draw the graphs of these models and explain your analysis. Will monetary policy be effective in promoting economic recovery from the recession? Will unemployed workers share in this recovery? Do these models allow for the possibility of a “jobless recovery”?

b. Descriptive statistics and estimation results for the regression line found in the attached Figure 2-16 from the 2010 Economic Report of the President are shown below. Please interpret the coefficients from this regression. In 2009 and 2010, real GDP increased 0.19 percent and 2.54 percent respectively while the unemployment rate increased 3.1 percentage points in 2009 and fell 0.4 percentage points in 2010. Are the data for 2009 and 2010 consistent with the regression presented in Figure 2-16? Does any behavior discussed in Part A’s analysis of the labor market help to explain the position of 2009 and 2010 if they were plotted in the figure? Explain whether or not this behavior is captured in the estimated regression equation.

c. In March 2009 the Federal Reserve began a policy known as Quantitative Easing (QE) to provide further stimulus from monetary policy. What is QE? How does QE differ from a more traditional Open Market Operation and the targeting of a short-term interest rate? Use a model of the Credit (Loanable Funds) market to explain how QE affects interest rates and the quantity of funds borrowed and lent. Finally, use a simple supply and demand model of the foreign exchange market to explain the effects of QE on the exchange rate between the U.S. dollar and the Euro. In your model make sure that the exchange rate is defined in terms of U.S. dollars per Euro. Why did a second round of Quantitative Easing, announced in November 2010, cause protests from policy makers in other countries when the earlier use of Quantitative Easing did not?

d. Does QE have long run effects on economic growth? Use the Neoclassical (Solow) growth model to explain whether this particular form of monetary policy will affect steady-state real income per capita for the U.S. economy.
Table 1. Descriptive Statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change in Unemployment Rate (Q4/Q4)</td>
<td>1.9949</td>
<td>1.7230</td>
<td>-1.8617</td>
<td>3.8280</td>
</tr>
<tr>
<td>Percentage Change in Real GDP (Q4/Q4)</td>
<td>0.3172</td>
<td>0.9377</td>
<td>-0.4920</td>
<td>2.1090</td>
</tr>
</tbody>
</table>

Source: Bureau of Labor Statistics, Bureau of Economic Analysis

Table 2. Linear Regression Estimates
(Dependent variable: Change in Unemployment Rate)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage Change in Real GDP (Q4/Q4)</td>
<td>-0.4941</td>
<td>0.0862</td>
</tr>
<tr>
<td>Intercept</td>
<td>1.3030</td>
<td>0.2217</td>
</tr>
</tbody>
</table>

Number of observations: 9
Adjusted R square: 0.7994
Sample Exam 2: Stimulating Stimulus?

The most recent economic recession began in December 2007 and ended in June 2009, with real GDP falling more than 5 percent over this period. In response to the economic downturn, Congress passed and President Obama signed the $787 billion American Recovery and Reinvestment Act. President Obama (Press Conference February 9, 2009) claimed “And that is why the single most important part of this economic Recovery and Reinvestment Plan is the fact that it will save or create up to 4 million jobs — because that's what America needs most right now. “ This fiscal stimulus has been controversial. Some have suggested that the stimulus is not working, or that the magnitude of the stimulus was not enough to end the recession quickly. There are renewed calls for a second fiscal stimulus. Others criticize the fiscal stimulus on the grounds that it will never be effective, no matter its size. Answer the following questions to evaluate how well the fiscal stimulus worked in stopping the economic decline and moving the economy toward recovery.

a. Under the assumption of an economy that is closed to international trade, illustrate and explain the argument that large increases in government spending and tax cuts will be effective in boosting output and employment. Use the IS/LM – AS/AD macroeconomic model as well as models of the labor market, goods market, and money market that underlie the IS/LM – AS/AD framework to support your reasoning. Your answer should illustrate and explain a consistent set of movements in five graphical models: the labor market, goods market, money market, IS/LM, and AS/AD. Using the same framework, then explain why some suggest that such a fiscal stimulus will not be effective in increasing output and employment.

b. Use economic theory to consider whether the American Recovery and Reinvestment Act will have long run economic effects. Use the Solow economic growth model to explain whether the fiscal stimulus will affect steady-state equilibrium income per capita for the U.S. economy.

c. Moving to the more realistic assumption of an open economy, provide an analysis of the effect of the fiscal stimulus in the foreign exchange market. For standardization purposes, please define the exchange rate as units of foreign currency per U.S. dollar. Discuss how the fiscal stimulus will affect both the U.S. current and financial (also known as the capital) accounts. Explain how changes in both these accounts would impact the exchange rate. Describe whether these movements in the exchange rate would enhance or detract from the overall effectiveness of the fiscal stimulus.
Sample Exam 3: Financial and Economic Meltdown

The financial market turmoil that began in the summer of 2007 clearly spilled over to the broader economy, leading to a sharp contraction in economic activity. Speaking in the fall of 2008, Federal Reserve Chairman Ben Bernanke said:

This financial crisis has been with us for more than a year. It was sparked by the end of the U.S. housing boom, which revealed the weaknesses and excesses that had occurred in subprime mortgage lending… The unwinding of these developments, including a sharp deleveraging and a headlong retreat from credit risk, led to highly strained conditions in financial markets and a tightening of credit…. By restricting flows of credit to households, businesses, and state and local governments, the turmoil in financial markets and the funding pressures on financial firms pose a significant threat to economic growth. Credit markets will take some time to unfreeze.1

Signs of the economic turmoil were widespread. In early December 2008, the business cycle dating committee of the National Bureau of Economic Research officially “determined that a peak in economic activity occurred in the U.S. economy in December 2007. The peak marks the end of the expansion that began in November 2001 and the beginning of a recession.” From October 2007 through early December 2008, U.S. equity prices were down almost 45 percent.

a. How exactly do problems in the financial sector spill over to the real sector of the economy? Use the closed economy IS/LM model to explain the short-run real effects of financial market turmoil as described by Bernanke. Along with the IS/LM graph, your analysis should include the underlying models for the goods market and money market that lie behind the IS and LM curves. Use the goods and money market models to explain the movements in IS/LM equilibrium. This analysis should ignore any changes in monetary or fiscal policy - your answer should describe the effects of the market turmoil in the absence of any policy response.

b. Many analysts compared the economic turmoil during the crisis to that experienced during the Great Depression and questioned whether the U.S. economy was headed for a decade of misery. Most of these commentators were concerned about the effect of a precipitous decline in consumption. According to New York Times columnist Thomas L. Friedman:

The equity crisis made people feel poor and metastasized into a consumption crisis, which is why purchases of cars, appliances, electronics, homes and clothing have just fallen off a cliff. This, in turn, has sparked more company defaults, exacerbated the credit crisis and metastasized into an unemployment crisis, as companies rush to shed workers.2

The standard economic model for analyzing long-run economic developments is the Solow model, in which output ($Y$) is a function of labor ($L$), capital ($K$) and the level of technology ($A$). In particular, output at a point in time $t$ is determined according to the Cobb-Douglas production function $Y_t = A \cdot K_t^{\alpha} \cdot L_t^{1-\alpha}$. In the model, capital accumulates according to $K_{t+1} = K_t + I_t - d \cdot K_t$ where $I_t$ is investment and $d$ is the rate of depreciation. Investment funds are available from savings which itself is a constant fraction $s$ (the savings rate) of income, so that $I_t = S_t = s \cdot Y_t$.

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1 Stabilizing the Financial Markets and the Economy, a speech by Chairman Ben S. Bernanke to the Economic Club of New York, October 15, 2008.

(i). Use a graphical version of the Solow model to illustrate and explain the steady-state equilibria as an economy moves from an initial, relatively high savings rate of $s_1$ to a new lower savings rate of $s_2$ and then back to a savings rate of $s_1$. Your graphical model should have capital per worker on the horizontal axis and output per worker on the vertical axis. Explain the transition from the steady state with savings rate $s_1$ to that with savings rate $s_2$ and back again.

(ii). Using the graphical version of the Solow model, illustrate and explain which steady-state will have higher consumption. Carefully explain whether or not your analysis is consistent with Friedman’s description of a consumption crisis. How do you reconcile the predictions of this Solow growth model to those of the IS/LM model considered in part A?
Sample Exam 4: Fiscal Cliff

The “Fiscal Cliff” refers to the large tax increases and spending cuts scheduled for January 2013. On January 1, 2013, the American Taxpayer Relief Act of 2012 was passed by Congress and signed by President Obama. The legislation postpones the spending cuts and only moderately increases tax rates. However, the legislation does eliminate the two-year temporary tax cut of 2 percentage points on the Social Security payroll tax. As a result, the individual’s share of the payroll tax rate immediately rises to 6.2 percent from 4.2 percent for earnings up to $113,700. All the provisions in the Act aim to reduce the $1.1 trillion Federal government budget deficit.

a. Use the Inter-temporal choice model for a representative agent (with current time period values on the horizontal axis and future time period values on the vertical axis) to illustrate and explain the effects of the payroll tax increase on consumer spending and saving.

b. Use the Labor-Leisure model for a representative agent (with total hours of time on the horizontal axis and earned income on the vertical axis) to explain the effects of the payroll tax increase on a representative individual’s allocation of time between labor and leisure. Based on this analysis, illustrate and explain the implications of the increase in the payroll tax for equilibrium in the labor market.

c. Use the IS-LM model for a closed economy (with real GDP on the horizontal axis and the real interest rate on the vertical axis) to explain the effects of the payroll tax increase on income and interest rates in the near future (short run). Be sure to clearly illustrate and explain whether or not the stance of monetary policy is likely to change as a result of the passage of the legislation.

d. Does the payroll tax increase also have long run implications? Use the Solow Economic Growth model to illustrate and explain. For purposes of standardization, assume that output $Y$ is a function of two inputs, labor $L$ and capital $K$ as well as the level of total factor productivity $Z$, with a Cobb-Douglas production function of the form: $Y = z \cdot K^\alpha \cdot L^{1-\alpha}$. The output elasticity of capital is $\alpha = \frac{\%\Delta Y}{\%\Delta K}$ and the capital accumulation equation is $K_{t+1} = K_t - d \cdot K_t + I_t$, where $t$ is a time index, $d$ is the depreciation rate and $I$ is investment expenditure. Savings is $S$ and the savings rate is given by $S = \frac{S}{Y}$. Assume that the labor force grows at the rate $n$, so that $L_{t+1} = (1 + n) \cdot L_t$, and total factor productivity $z$ grows at the rate $g$. In steady state equilibrium, $s \cdot y = (n + d) \cdot k$, where $y$ and $k$ represent income and capital per worker. Are there long run effects of the payroll tax increase on the level and growth rate of real GDP per worker? Carefully illustrate and explain your answer.