Economics 102
Spring 2008
Answer to Homework #4

1. Long Run Growth

a)

real wage

supply of
labor

demand for
labor

Qlabor

Real GDP
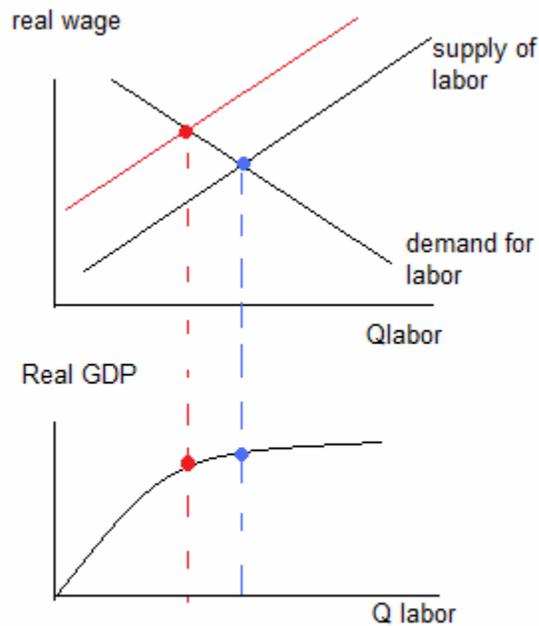
Q labor

If an epidemic wipes out a quarter of the labor force, we can see in our supply and demand graph that the supply of labor would shift left to the red supply line. There is an obvious decrease in the quantity of labor. The wage rate will increase.

Carrying our new equilibrium in the labor market down to our graph of aggregate production, we see that we will have moved left along the aggregate production curve from the blue dot to the red dot. We can see that total output has fallen somewhat, though the productivity of labor has increased. Remember that labor productivity can be seen on a graph by drawing a line from the origin through the point at which the economy is producing. A line through the red point is steeper than a line through the blue point. This is how we know labor productivity has increased.
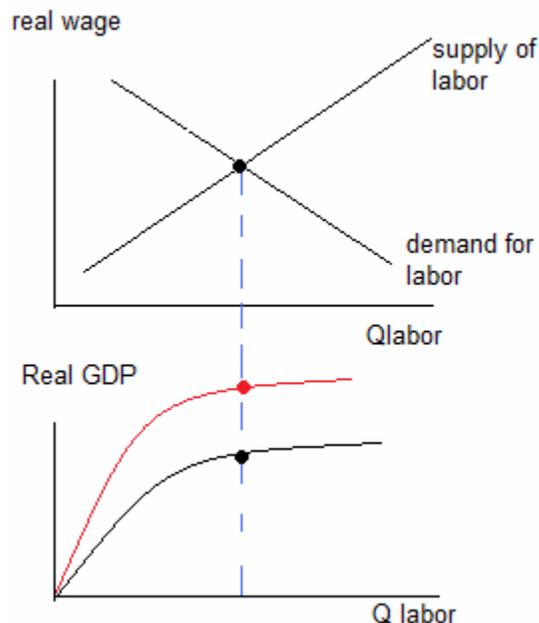
b)
If the average level of education greatly increases, that means that each member of the labor force is more valuable and has a higher ability to produce than he or she did before being educated. As a result, the aggregate production function shifts upwards in a direction consistent with economic growth. No change is observed in the quantity of labor, or wage rate. We do know, however, that labor productivity has increased. Remember that labor productivity can be seen on a graph by drawing a line from the origin through the point at which

real wage

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Real GDP

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the economy is producing. A line through the red point is steeper than a line through the black point. This is how we know labor productivity has increased.

2. The Loanable Funds Market

a)
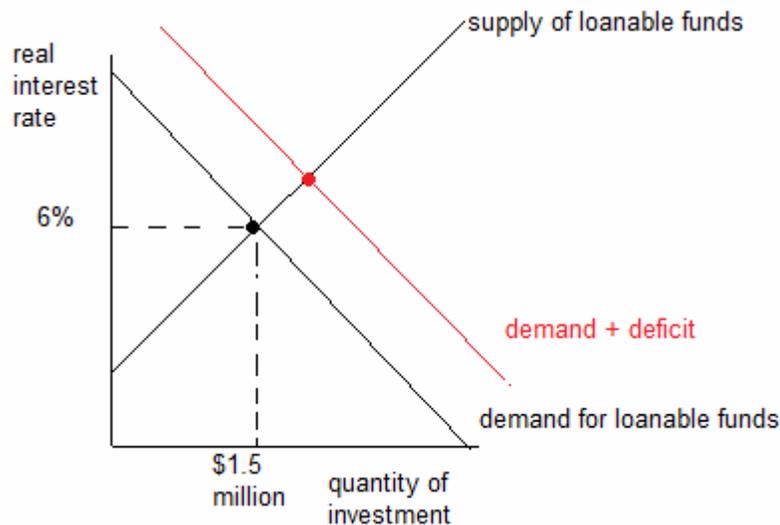
Here we see the graph for the loanable funds market. By setting the supply and demand equations equal to one another, we have determined that the quantity of investment is $1.5 million dollars and the real interest rate is 6%.

$$2q+3=-2q+9$$
$$4q=6$$
$$q=1.5$$

Plug 1.5 into one of the equations to get 6%

The red line represents the demand for loanable funds plus the government deficit. To find the answers in parts b) and c), we will be doing this with the red curve, once we figure out what the equation for that curve is.

b) and c)

To figure out the new equilibrium interest rate and quantity of private investment, we first need to figure out the equation of the curve "demand + deficit" as drawn above. We can do this by adding .5 million to the y value of any two known points on the original demand curve. We already know one point, so let's start there. We know the point (1.5, 6). On our new line we then have a point of (2, 6). Another easy point is the y-intercept of the demand curve, a point we know to be (0, 9). On our new curve we would have a point of (.5, 9). From these two points we can figure out the slope of our line (which should be the same as the original demand curve) as -2. Our new y-intercept can also be found by plugging in one of these new points into our new equation. We get a y-intercept of 10%.

r=-2(q) + b   is our basic equation
6=-2(2)+ b   plug in one of our new points (I used (2, 6))
b=10%   solve and get 10% as the new y-intercept.
r=-2q+10   is our equation for demand + deficit

Now set the new demand curve equal to the supply curve:

2q+3=-2q+10
4q=7
q=1.75

Plug 1.75 million into one of the equations to get the new interest rate of 6.5%.

We now know the new interest rate. To find the quantity of private investment, we simply plug that new rate into the original demand curve, which is effectively the private demand for loanable funds (as opposed to public demand, represented by the government deficit's shifting of the demand curve to the right. When we do this we get a result of $1.25 million. This indicates that the government's $.5 million deficit decreased the demand for private investment by $.25 million.
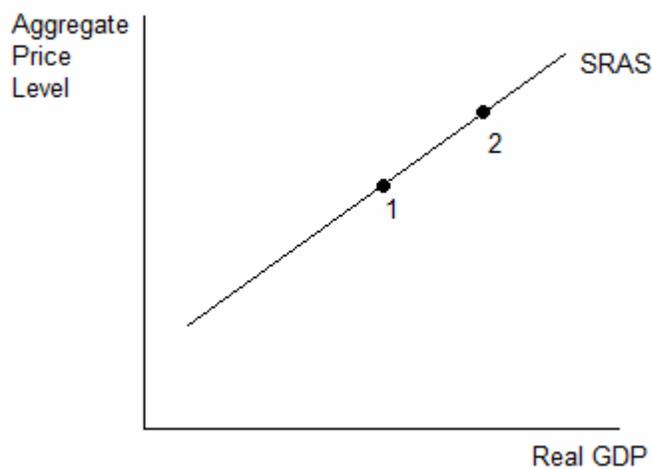
3. Short Run Aggregate Supply (SRAS)

a)
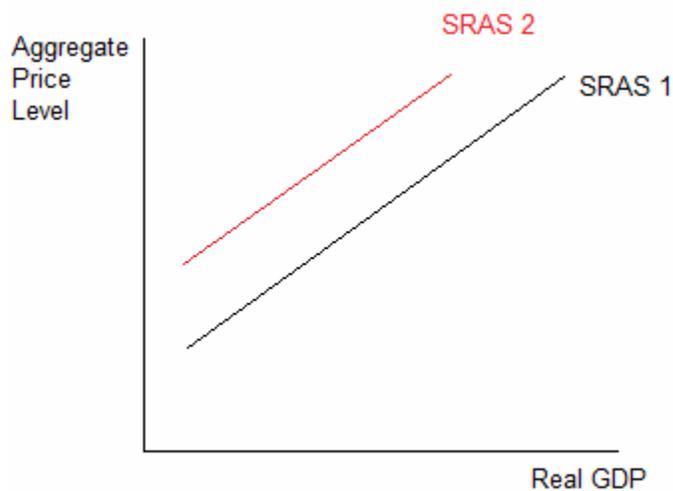
A rise in the price of oil will cause producers to produce less output. This results in a shift of the SRAS to the left. This is because production costs are now higher which will cause producers to produce less aggregate output at any given aggregate price level.

b)

A rise in CPI represents a movement along the SRAS curve. This is because the CPI is a measure of the aggregate price level. A movement from point 1 to point 2 on the curve is illustrative of inflation over time.

## 4. Long Run Aggregate Supply (LRAS)

a)
The LRAS curve illustrates the relationship between the aggregate price level and the quantity of aggregate output supplied in a model in which all prices, including nominal wages, were completely flexible. It is vertical because changes in the aggregate price level have no effect on aggregate output in the long run.

b)
There would have been a movement along the SRAS curve. If the increase in the quantity of aggregate output supplied was due to a rightward shift of the LRAS curve, the aggregate price level might not rise.
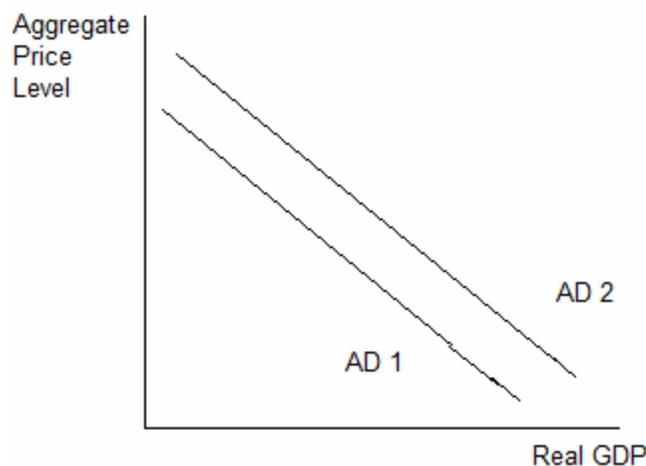
5. Aggregate Demand

a)
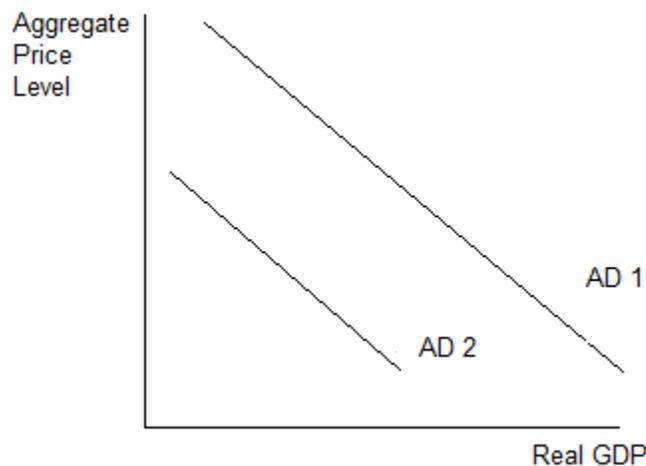
A rise in income tax rates is a shift of the aggregate demand curve to the left. A rise in income tax rates reduces people's disposable income. At any given aggregate price level, consumer spending is now lower, so the aggregate demand curve shifts to the left.

b)

A fall in the interest rate caused by a change in monetary policy will cause a shift of the AD curve. A lower interest rate encourages people to want to borrow more. This increases investment and consumer spending at any given price level, so the AD curve shifts to the right.

6. Putting the Classical Model Together
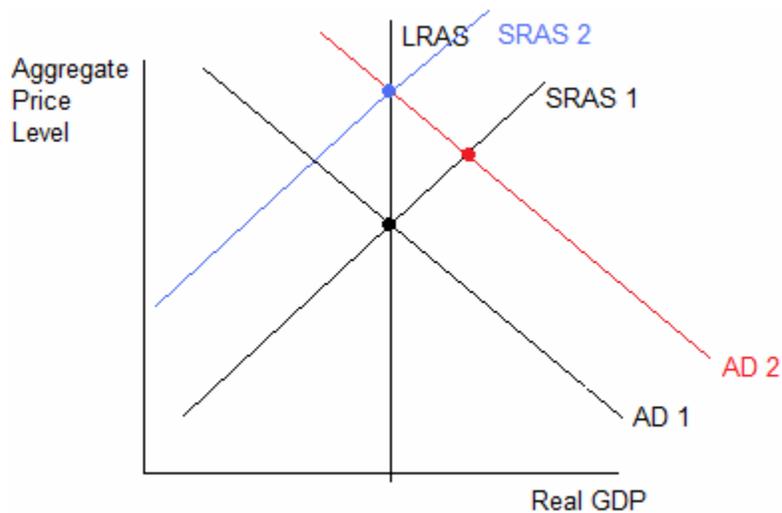
i. There is an increase in government spending. First, this is a positive demand shock. The government's increased demand has shifted the entire AD curve from AD 1 to AD 2. The economy moves from being on the LRAS curve (at the black point) to being on the SRAS 1 curve (at the red point). Aggregate price level increases, aggregate output increases, and unemployment is reduced in the short run.

ii. What happens eventually, according to the Classical Model?
Wages are somewhat sticky in real life, so we can take this step by step. After everything from part i. happens, wages (which are included in the aggregate price level) will rise. This eventual rise in nominal wages in the long run reduces SRAS and moves the economy back to potential output (the blue point).

iii. Knowing that in the Classical Model, "markets clear" the correct answer should be that we end up right back where we were. Do we? It is clear that we end up at the same level of output, though our aggregate price level has risen.