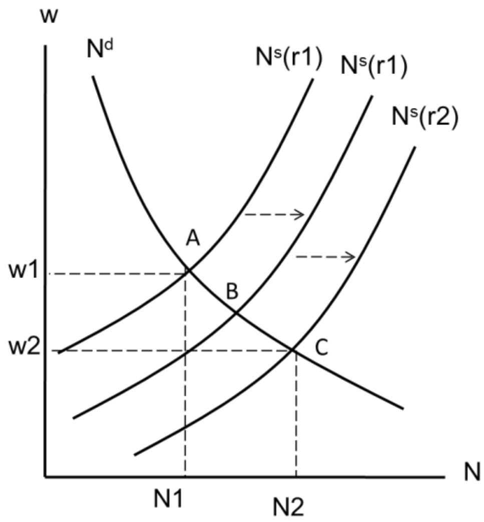
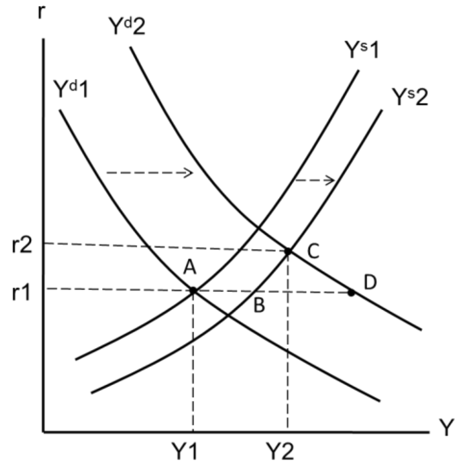
EE312 Macroeconomic Theory
Semester 1/2014
Homework II

Questions:

1. Use **the Monetary Intertemporal Model** to analyze the effects of an increase in current government spending on the real wage, employment, current output, the real interest rate, current consumption, investment and the price level.

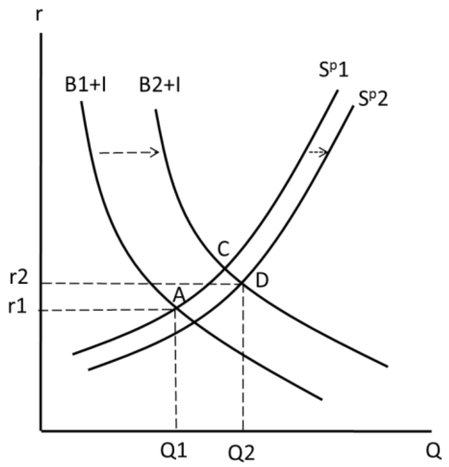




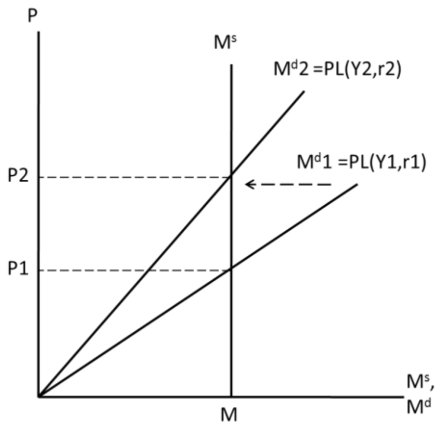
Answer:
In the labor market, an increase in government spending implies an increase in lifetime taxes. The consumer's lifetime wealth (and disposable income) decreases. The consumer reduces leisure as it is a normal good. Lower leisure means more labor supply. The labor supply curve shifts to the right. Employment and output are increasing while the real wage is falling. The output supply curve also shifts to the right from point A on Ys1 to point B on Ys2.

In the goods market, the increase in government spending raises the total demand for current goods by the amounts of $\Delta G + MPC\Delta G$. But the lower lifetime wealth also reduces current consumption and the total demand for current goods by the amount of $MPC\Delta G$. So the net increase in total demand for current goods is $\Delta G + MPC\Delta G - MPC\Delta G = \Delta G$. The output demand curve shifts to the right by the amount of ΔG (the distance AD).

The output demand curve shifts to the right more than the output supply curve because the effect of the increase in government spending on output demand is stronger than the effect on output supply. The effect of the increase in government spending on lifetime wealth and leisure spreads over a lifetime. So the increase in labor supply and the rightward shift of the output supply curve are small. The decrease in current consumption as a result of a decrease in lifetime wealth is also small for the same reason so that the effect of government spending on the total demand for current goods is strong. The net effect is that the real interest rate increases from r1 to r2.



In the labor market, the rising real interest rate raises the opportunity cost of leisure. The consumer reduces leisure and increases labor supply. The labor supply curve shifts further to the right to Ns (r2). Employment increases from N1 to N2 while the real wage drops from w1 to w2. Output (from the production function) increases from point B to point C on Ys2. In total, output increases from Y1 to Y2. In the goods market, the higher real interest rate also reduces current consumption and investment demand as the real interest rate is the opportunity cost of both current consumption and investment.



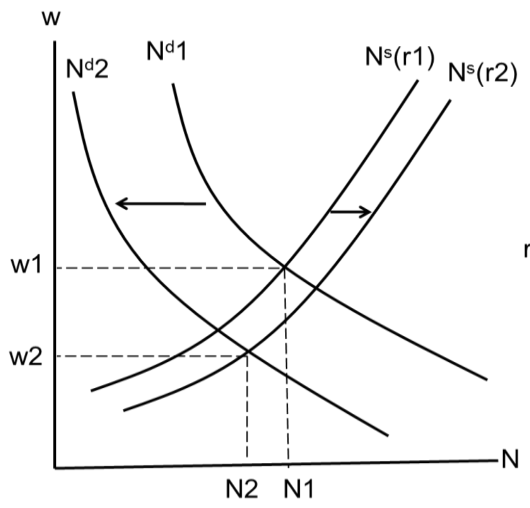
The increase in government spending causes an increase in government borrowing (bond sale) and the demand for credit in the credit market. The credit demand curve shifts to the right. The higher real interest rate induces private saving to increase (movement along the curve AC). Higher income also raises private saving, causing the credit supply curve to shift to the right (CD). The intertemporal effect of government spending on current consumption and saving is small. So the net effect is still a higher real interest rate from r1 to r2 in the credit market.

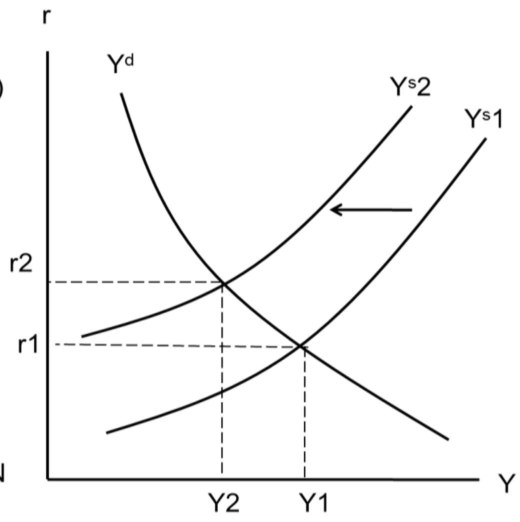
In the money market, higher income (and output) induces more demand for money while the higher real interest rate reduces the money demand. If the real interest rate effect is stronger, the demand for money increases. The money demand curve rotates to the left from Md1 to Md2, given the money supply. The price level increases from P1 to P2.

In conclusion, an increase in government spending results in higher employment, output and income, a higher real interest rate, a lower real wage, lower investment and lower current consumption (lower lifetime wealth and a higher real interest rate reduce consumption but higher current income increases it; the real interest rate effect is stronger.)

2. Use **the Monetary Intertemporal Model** to analyze the effects of a temporary decrease in current total factor productivity on employment, the real wage, current output, the real interest rate, current consumption, investment and the price level.

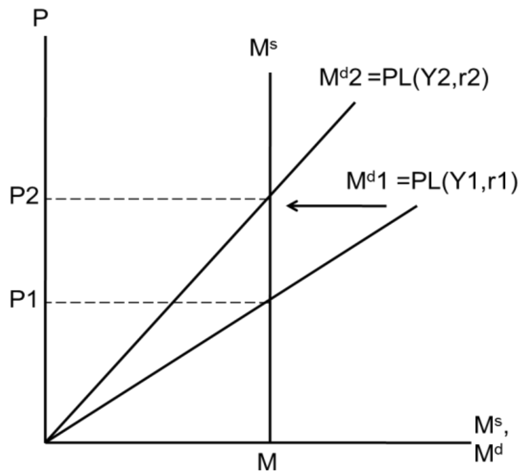
Answer:





A decrease in current total factor productivity (z) causes the marginal production of labor (MP_N) to decrease. The firm demands less labor services for a given real wage. The labor demand curve shifts to the left (from N^d1 to N^d2). The real wage is falling, inducing the consumer to supply less labor services. Employment and output (through the production function) decrease.

The output supply curve shifts to the left from Y^s1 to Y^s2. The real output level falls from Y1 to Y2 while the real interest rate increases from r1 to r2. A higher real interest rate causes the demands for investment and consumption goods to decrease. The lower output (and income) also reduces the demand for consumption goods. Lower investment and consumption cause output demand to decrease to match the lower output supply.



The higher real interest rate causes current leisure to be more costly. The consumer reduces current leisure and provides more labor services. The labor supply curve shifts rightwards from $N^s(r1)$ to $N^s(r2)$. The real wage drops further from w1 to w2. Employment finally decreases from N1 to N2, corresponding to the lower level of output at Y2.

Consumption drops as a result of lower real income and the higher real interest rate. Investment is also lower because of the higher real interest rate.

In the money market, the lower real income causes the demand for money to decrease. The higher real interest rate means higher opportunity cost of holding money which also causes money demand to decrease. The money demand curve rotates to the left from M^d1 to M^d2 and the price level increases from P1 to P2.

In the credit market, the falling real income causes private saving to decrease. The credit supply curve shifts leftwards from S^p1 to S^p2. The real interest rate increases from r1 to r2.

In conclusion, a decrease in current total factor productivity results in a lower real wage, lower employment and output, a higher real interest rate, and lower consumption and investment demand.

Submission date: Wednesday 22 April 2015; 13:00hr.