

Solution Key: Homework 3
Economics 101 - Chapters 4 and 9

1a) $\% \Delta M + \% \Delta V = \% \Delta P + \% \Delta Y$ so $9\% + 0 = \pi + 6\%$ so $\pi = 3\%$
 $r = i - \pi = 7\% - 3\% = 4\%$

b) now $8\% + 0 = \pi + 6\%$ so $\pi = 2\%$
Since the real interest rate is determined by the real side of the economy, r is still 4%.
(But the nominal interest rate will become $i = r + \pi = 4\% + 2\% = 6\%$.)

2) A major benefit of having a national money is seigniorage – the ability of the government to raise revenue by printing money. The major cost is the possibility of inflation, or even hyperinflation, if the government relies too heavily on seigniorage and prints too much money. The foreign country's political stability is a key factor. Zimbabwe could gain the price stability of South Africa by using their currency. But Zimbabwe should not use the currency of a country less stable than itself, since then it would lose the seigniorage and lose price stability both.

3a) Production: $Y = 80K^{1/2} L^{1/2} = 80(100)^{1/2} (100)^{1/2} = \underline{8000}$

Goods market equilibrium condition: $Y = C + I + G$

$$8000 = 600 + .6(8000 - 3000) + 2000 - 6000r + 3000$$

$$-600 = -6000r \quad \text{so} \quad \underline{r = 0.10}$$

Real wage: $(W/P) = MPL = 40K^{1/2} L^{-1/2} = 40 * 100^{1/2} 100^{-1/2} = \underline{40}$

Money market equilibrium condition: real money supply = real money demand,

$$M^s/P = (M/P)^d$$

$$3000/P = 0.2Y - 1000r = 0.2(8000) - 1000(0.10) = 1600 - 100 = 1500$$

So $P = 2$ (units of money per good)

Nominal wage: $W = (W/P) * P = 40 * 2 = \underline{80}$ (units of money)

b) The solution for output, real interest rate, and real wage above still hold, so no change in these real variables.

The money market equilibrium becomes:

$$M^s/P = (M/P)^d$$

$$3300/P = 0.2Y - 1000r = 0.2(8000) - 1000(0.10) = 1500$$

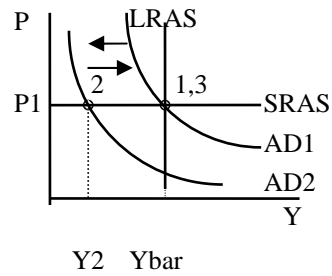
So $P = 2.2$

And this affects the nominal wage: $W = (W/P) * P = 40 * 2.2 = 88$ (units of money)

Yes, the classical dichotomy holds here, since the change in money only affected nominal variables, without any effect on the real variables in the economy.

4a) The temporary fall in velocity lowers demand in the economy (a leftward shift in the AD curve in the short run). This would lower output and generate a recession. Since price is fixed, inflation is not a problem in the short run. (Remember the AD curve here is determined

by the equation $M V = P Y$. A fall in velocity would lower output for a given price level and money supply.)



Since the shock to velocity is only temporary, demand will return to normal on its own in the long run. (AD shifts right in the long run back to its initial position. So there is no effect on output and no inflation in the long run.)

- b) To counteract the short-run effects of the shock, the Federal Reserve should increase the money supply in the short run. This would shift the AD to the right, returning it to its initial position. But it should reverse this policy in the long run. Otherwise when the velocity returns to normal in the long run, the extra money supply would generate inflation. (The AD curve would be to the right of its initial position before the velocity shock.)