ECON 222

Winter 2004 – Sections C and D

Assignment 3 – ANSWER KEY

Question 1

(a) Average real GDP is 737081.6. Average M1 is 54793.

(b) The average annual growth rate for M1 is 5.1%. The average growth rate for nominal GDP is 5.4%. This shows that an increase in the money supply of a certain percentage increases nominal GDP by about the same percentage.

(c) Velocity is not constant over the time period. Average velocity is 12.83.

(d) The correlation between M1 and real GDP is 0.96. The correlation between M1 and the CPI index is 0.76. Both M1 and the CPI index are procyclical.

Question 2

(a) (i) real money demand is 10, (ii) nominal money demand is 20.

(b) The money supply must have been 20. The velocity of money was $PY/M = 10$.

(c) Income elasticity is given by $\frac{0.01}{i}\frac{Y}{M^d/P} = 1$.

(d) Using the fact that $\pi = \frac{\Delta M}{M} - \frac{\Delta L}{L}$, we have $180 = 150 - \frac{\Delta L}{L}$. So money demand fell by 30% over the period.

(e) Using the fact that $\pi = \frac{\Delta M}{M} - \nu_Y \frac{\Delta Y}{Y}$, we have $180 = 150 - 1 * \frac{\Delta Y}{Y}$. So output fell by 30% over the period.

Question 3

(a) $13\% = \Delta M/M - \frac{2}{3}(3\%)$. Therefore $\Delta M/M = 15\%$.

(b) $5\% = 3\% - \frac{2}{3}(\Delta Y/Y)$. Therefore $\Delta Y/Y = -3\%$.

(c) $5\% = \Delta M/M - \frac{2}{3}(3\%)$. Therefore $\Delta M/M = 7\%$.

Question 4

(a) $S = Y - C - G = 0.5Y - 100 + 500r$. Setting $S = I$ gives $r = 0.08 - Y/4000$.

(b) Setting $Y = \bar{Y} = 200$ in the IS equation gives $\bar{r} = 0.03$.

(c) The new IS equation is $Y = 400 - 4000r$. Setting $Y = \bar{Y} = 200$ in the new IS equation gives $\bar{r} = 0.05$.

(d) Initial real money demand is given by
$M^d/P = 500 + 0.25(200) - 1200(0.03 + 0.02) = 490$. With the rise in the real interest rate, new real money demand is given by
$M^d/P = 500 + 0.25(200) - 1200(0.05 + 0.02) = 466$. So real money demand falls by 24.

(e) In order for $\bar{r}$ to stay at 0.03 with the new IS curve, Y must increase to 280. (Put $\bar{r} = 0.03$ into the new IS curve and solve for Y.) As a result the new real money demand will be $M^d/P = 500 + 0.25(280) - 1200(0.03 + 0.02) = 510$.