

ECON 222

Winter 2005 – Assignment 4

ANSWER KEY

1. Interest Rate Parity and Taxation – 20 marks

(a) Interest rate parity requires that

$$1 + i_{us} = (1 + i_{eu}) \frac{e_{nom}^f}{e_{nom}} = (1.05) \frac{0.8}{0.75} = 1.12$$

So, $i_{us} = 12\%$ and $1000/1.12 = 892.86$ will be the market price of the \$1000 1 year bond in the U.S.

(b) If $e^f = e$ then $1.05 - \pi_{eu}^e = 1.12 - 0.08$, so that $\pi_{eu}^e = 1\%$.

(c) If $e^f = e$ then $1 + 0.05(1 - t_{eu}) - 0.02 = 1 + 0.12(1 - 0.2) - 0.08$, so that $t_{eu} = 0.28$.

(d) If $t_{eu} > 0.28$, then $r_{eu} > r_{us}$, and so from interest rate parity, $e^f > e$.

2. Informative Signals and Inflationary Expectations – 30 marks

(a) In period 1: $\pi_1^e = 8\%$, $\bar{u}_1 = 6\%$ and since $\pi_1 = 2\%$, $u_1 = 12\%$.

In period 2: $\pi_2^e = 2\%$, $\bar{u}_2 = 9\%$ and since $\pi_1 = 2\%$, $u_2 = 9\%$.

(b) In period 1: $\pi_1^e = 8\%$, $\bar{u}_1 = 6\%$ and since $\pi_1 = 5\%$, $u_1 = 9\%$.

In period 2: $\pi_2^e = 5\%$, $\bar{u}_2 = 7.5\%$ and since $\pi_1 = 2\%$, $u_2 = 10.5\%$.

(c) Yes, the informative signal lowers the unemployment rate in both approaches.

One-year approach:

In period 1: $\pi_1^e = 5\%$, $\bar{u}_1 = 6\%$ and since $\pi_1 = 2\%$, $u_1 = 9\%$.

In period 2: $\pi_2^e = 2\%$, $\bar{u}_2 = 7.5\%$ and since $\pi_1 = 2\%$, $u_2 = 7.5\%$.

Two-year approach:

In period 1: $\pi_1^e = 6.5\%$, $\bar{u}_1 = 6\%$ and since $\pi_1 = 5\%$, $u_1 = 7.5\%$.

In period 2: $\pi_2^e = 3.5\%$, $\bar{u}_2 = 6.75\%$ and since $\pi_1 = 2\%$, $u_2 = 8.25\%$.

(d) One-year approach in period 1: $\pi_1^e = 5\% + x$, $\bar{u}_1 = 6\%$ and since $\pi_1 = 2\%$, $u_1 = 9\% + x$. Since $u_1 = 12\%$ without the signal, the bank will choose to use the signal as long as $x \leq 3$.

Two-year approach in period 1: $\pi_1^e = 6.5\% + x$, $\bar{u}_1 = 6\%$ and since $\pi_1 = 2\%$, $u_1 = 7.5\% + x$. Since $u_1 = 9\%$ without the signal, the bank will choose to use the signal as long as $x \leq 1.5$.

3. Purchasing Power Parity and Net Exports – 15 marks

(a) The price level in Canada is $P_{can} = (200 + 850 + 150)/3 = 400$. The price level in the U.S. is $P_{us} = (150 + 600 + 150)/3 = 300$. If purchasing power parity holds, $e = 1$, so $e_{nom} = 0.75$.

(b) If the price of computers rises by 75%, then $P_{com} = 350$. This increases the price level in Canada to $P_{can} = 450$. If purchasing power parity holds, then e_{nom} falls to 0.67.

4. Open Economy IS-LM Model – 35 marks

(a) The equilibrium condition is: $S^d - I^d = NX$. By substituting the equation for e you get the NX . Given \bar{Y} , \bar{Y}_{US} and r_{US} , we get: $r_{CAN} = 1.54$, $e = 0.554$, $EX = 58.45$, $IM = 65.54$ and $NX = -7.09$.

(b) We repeat the same exercise with $t = 0$. We get: $r_{CAN} = 2$, $e = 0.60$, $EX = 70$, $IM = 69$ and $NX = 1$.

(c) The IS curve shifts up and to the right and using the LM curve we get: $r_{CAN} = 2.4$ and $Y_{CAN} = 218$.

(d) Using the LM curve at $Y_{CAN} = 200$ and $r_{CAN} = 3$, we get $M = 130$.