ADVANCED MICROECONOMICS - 2013/2014

Solutions Sheet 3: General equilibrium with uncertainty

1 (a) $x_2^1 = x_2^2$.

(b) If $\pi_1^1 > \pi_2^1$ then $x_2^1 < x_2^2$. And, if $\pi_1^1 < \pi_2^1$ then $x_2^1 > x_2^2$.

(c) The utility function of the first consumer is parallel to his budget restriction.

2

3 $x_1^1 = x_1^2 = x_2^1 = x_2^2 = 2$, $p^1 = p^2$, $z_{11} = -1$, $z_{12} = 2$, $z_{21} = 1$, $z_{22} = -2$, and $q_1 = 2q_2$.

4 $x_1^1 = x_1^2 = x_2^1 = x_2^2 = 2$, $p^1 = p^2$, $z_{11} = z_{12} = z_{21} = z_{22} = 0$, and $q_1, q_2 \in \mathbb{R}_+$.

5 (a) $p_1^1 = 6$, $p_2^1 = 2$, $p_1^2 = 2$, $p_2^2 = 1$, $x_{11}^1 = \frac{7}{9}$, $x_{12}^1 = \frac{7}{3}$, $x_{11}^2 = \frac{11}{9}$, $x_{12}^2 = \frac{11}{3}$, $x_{21}^1 = \frac{7}{6}$, $x_{22}^1 = \frac{7}{3}$, $x_{21}^2 = \frac{11}{6}$, $x_{22}^2 = \frac{11}{3}$.

(b) $p_1^1 = 6$, $p_2^1 = 2$, $p_1^2 = 2$, $p_2^2 = 1$, $q_1 = 6$, $q_2 = 2$, $x_{11}^1 = \frac{7}{9}$, $x_{12}^1 = \frac{7}{3}$, $x_{11}^2 = \frac{11}{9}$, $x_{12}^2 = \frac{11}{3}$, $x_{21}^1 = \frac{7}{6}$, $x_{22}^1 = \frac{7}{3}$, $x_{21}^2 = \frac{11}{6}$, $x_{22}^2 = \frac{11}{3}$, $z_{11} = \frac{-1}{6}$, $z_{12} = \frac{1}{2}$, $z_{21} = \frac{1}{6}$, $z_{22} = \frac{-1}{2}$.

6

7

$$r(c) = \begin{cases} (2-c, 3-c, 4-c, 2-c, 5-c) & \text{if } c \in [0,2] \\ (0, 3-c, 4-c, 0, 5-c) & \text{if } c \in [2,3] \\ (0, 0, 4-c, 0, 5-c) & \text{if } c \in [3,4] \end{cases}$$

8 $Q_1 = \frac{1}{3} - t$, $Q_2 = \frac{2}{3}$, and $Q_3 = t$. It is arbitrage free if and only if $t \in (0\frac{1}{3})$. The markets are not complete.

9 (a) $q = 8$.

(b) $q = 7$.

(c) q unknown.