$$\theta_1 = \{\ 1,\ 2,\ 3\ \}$$
$$\theta_2 = \{\ 2,\ 3\ \}$$

$$k^*(\theta_1,\ \theta_2\ ) = \begin{cases} 2\ buys\ from\ 1 & ,if\ \theta_1 \geq \theta_2 \\ 1\ buys\ from\ 2 & ,o/w \end{cases}$$

$v_1(k^*(1,2),1) = 1 + 1 = 2$

$v_1(k^*(1,3),1) = 1 + 1 = 2$

$v_1(k^*(2,2),2) = -2 + 0 = -2$

$v_1(k^*(2,3),2) = 2 + 2 = 4$

$v_1(k^*(2,2),3) = -3 + 0 = -3$

$v_1(k^*(3,3),3) = 3 + 3 = 6$

$v_2(k^*(1,2),2) = -2 + 0 = -2$

$v_2(k^*(1,3),3) = -3 + 0 = -3$

$v_2(k^*(2,2),2) = 2 + 2 = 4$

$v_2(k^*(2,3),3) = -3 + 0 = -3$

$v_2(k^*(3,2),2) = 2 + 2 = 4$

$v_2(k^*(3,3),2) = 3 + 3 = 6$

$$\xi_1(1) = \frac{1}{2}v_2\left(k^*(1,2),2\right) + \frac{1}{2}v_2\left(k^*(1,3),3\right)$$
$$= \frac{1}{2} \times (-2) + \frac{1}{2} \times (-3)$$
$$= \frac{-5}{2}$$

$$\xi_1(2) = \frac{1}{2}v_2\left(k^*(2,2),2\right) + \frac{1}{2}v_2\left(k^*(2,3),3\right)$$
$$= \frac{1}{2} \times (-3) + \frac{1}{2} \times (4)$$
$$= \frac{1}{2}$$

$$\xi_1(3) = \frac{1}{2}v_2\left(k^*(3,2),2\right) + \frac{1}{2}v_2\left(k^*(3,3),3\right)$$
$$= \frac{1}{2} \times (4) + \frac{1}{2} \times (6)$$
$$= \frac{-10}{2}$$
$$= 5$$

$$\begin{aligned}
\xi_2(2) &= \frac{1}{3} v_1\left(k^*\left(1,2\right),1\right) + \frac{1}{3} v_1\left(k^*\left(2,2\right),2\right) + \frac{1}{3} v_1\left(k^*\left(3,2\right),3\right) \\
&= \frac{1}{3} \times (2) + \frac{1}{3} \times (-2) + \frac{1}{3} \times (-3) \\
&= -1
\end{aligned}$$

$$\begin{aligned}
\xi_2(3) &= \frac{1}{3} v_1\left(k^*\left(1,3\right),1\right) + \frac{1}{3} v_1\left(k^*\left(2,3\right),2\right) + \frac{1}{3} v_1\left(k^*\left(3,3\right),3\right) \\
&= \frac{1}{3} \times (2) + \frac{1}{3} \times (4) + \frac{1}{3} \times (6) \\
&= 4
\end{aligned}$$