Economics 326: Suggested Solutions to Final

19th April, 2004

1.(a) In the least cost separating equilibrium, $e_L = 0$ and $e_H = (\theta_H - \theta_L)\theta_L$. In equilibrium, $w(e_L) = \theta_L$ and $w(e_L) = \theta_H$. Outside equilibrium, $w(e) \in [\theta_L, \theta_H]$ and $w(e) \leq \theta_L + e/\theta_L$.
(b) In the least cost pooling equilibrium, $e_L = e_H = 0$. In equilibrium, $w(e_L) = E[\theta]$. Outside equilibrium, $w(e) \in [\theta_L, \theta_H]$ and $w(e) \leq E[\theta] + e/\theta_L$.

2. (a) As θ_2 increases, q_2 increases in q_1 decreases. An increase in θ_2 means the high type gains more utility from quality and so should be given a higher quality. However, the high type's information rents $q_1(\theta_2 - \theta_1)$ increase, so the seller responds by reducing q_1. As $\theta_2 \to \theta_1$, so q_2 and q_1 converge to q_1^*, which satisfies $c'(q_1^*) = \theta_1$.
(b) As θ_1 increases, q_1 is increases and q_2 is unaffected. An increase in θ_1 means that agent 1 prefers wine more, so should be given a higher quality. In addition, the information rent of agent 2 disappears. As $\theta_2 \to \theta_1$, so q_1 converges to q_2^*, which satisfies $c'(q_2^*) = \theta_2$.

3. (a) We should not ban smoking.
(b) A majority vote would ban smoking.
(c) A randomly assigned dictatorship would ban smoking with probability 2/3.
(d) No! Agents 1 and 2 would claim their value is $+\infty$, while agent 3 would claim their value is $-\infty$.
(e) Clarke tax. Agent 1 must pay \$1300 if smoking is banned. Agent 2 must pay \$1000 if smoking is banned. Agent 3 must pay -\$1500 if smoking is banned. With truthtelling, smoking will not be banned and payments will be zero.

4. (a) The price equals q.
(b) The good firm sells computers if $p \geq c_H$. If $(q_L + q_H)/2 \geq c_H$ the price is $p = (q_L + q_H)/2$ and both types of firms sell computers. If $(q_L + q_H)/2 < c_H$ the price is $p = q_L$ and only bad firms sell computers.
(c) A consumer is willing to pay 1. Profit from quality q_H is $q_H - c_H$, which exceeds the profit in part (b) as $p < q_H$. Thus the high type offers the warranty.
(d) In the signalling game, the good quality firm offers a warranty. The bad quality firm is indifferent between offering one and not.