

Supplemental Material for Stephen K. Layson, "Third-Degree Price Discrimination with Interdependent Demands" *The Journal of Industrial Economics* 46 (4), pp. 511-524

12. For an example demonstrating that prices can rise in both markets under price discrimination, let the monopolist's marginal cost be 20 and let the market demands be:

$$\begin{aligned}q_1 &= 100 - p_1 + .0004p_1^2 + .7p_2 \\ q_2 &= 120 + .7p_1 - p_2\end{aligned}$$

Under uniform pricing, the profit maximizing price is $p=254.917$. Under profit maximizing price discrimination, the optimal prices are $p_1=275.133$ and $p_2=255.593$. Note in this example that the strong market demand curve is strictly convex.

For an example demonstrating that prices can fall in both markets under price discrimination, let marginal cost be 20 and let the market demands be:

$$\begin{aligned}q_1 &= 160 - p_1 + .7p_2 \\ q_2 &= 100 + .7p_1 - p_2 + .007p_2^2\end{aligned}$$

Under uniform pricing, the profit maximizing price is $p=250.433$. Under profit maximizing price discrimination the optimal prices are $p_1=250.429$ and $p_2=239.185$. Note in this example that the weak market demand curve is strictly convex.