Errata file for
"Practice Exercises for Intermediate Microeconomic Theory" MIT Press

Eric Dunaway, John C. Strandholm, Espinola-Arredondo, and Felix Munoz-Garcia

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1. **Chapter 4.**
   - Page 81, Self-assessment 4.9 should read "Chelsea's utility function is $u(x, y) = 3x^{1/2} + 4y$, her income is...". The answer key to the exercise is correct.
2. **Chapter 17.**
   - Page 393.
     - Previous-to-last displayed equation should read

       $$(14 - 2q - 2) - 6\alpha^2 q = 0,$$

       which simplifies to $12 = q(2 + 6\alpha^2)$."
     - Last displayed equation should read

       $$q^{SO} = \frac{12}{2 + 6\alpha^2}.$$

   - Page 394.
     - First displayed equation should read

       $$\frac{12}{2 + 6\alpha^2} > \frac{8}{2 + 6\alpha^2},$$

     - Fourth line should read "...and the marginal damage is $6\alpha^2 q$. Compared to example..."
     - Second displayed equation should read

       $$q^{SO} = \frac{12}{2 + 6(1)^2} = \frac{12}{8} = 1.5 \text{ units.}$$

     - Fourth displayed equation should read

       $$(10 - 2q - 2) - \left(6\alpha^2 q + 5\alpha\right) = 0$$

       which simplifies to $8 - 5\alpha = q(2 + 6\alpha^2)$. Solving for..."
     - Last displayed equation should read

       $$q^{SO} = \frac{8 - 5\alpha}{2 + 6\alpha^2}.$$

       Socially optimal output can become negative if $q^{SO} = \frac{8-5\alpha}{2+6\alpha^2} < 0$, or $8 - 5\alpha < 0$ (because the denominator of q^{SO} is unambiguously positive). Solving for α in $8 - 5\alpha < 0$, we find that output should be banned if $\alpha > \frac{8}{5} \simeq 1.6$. Intuitively, if every unit of output..."

- Page 400. Sixth displayed equation should read

$$10 - 2q - 2 + 10\alpha^2 q = 0.$$

Rearranging, we obtain $q(2 - 10\alpha^2) = 8$, and finally, the socially optimal output

$$q^{SO} = \frac{8}{2 - 10\alpha^2}.$$

- Page 401.
  - Figure 17.1 should be replaced by the following figure. Its interpretation is unaffected.

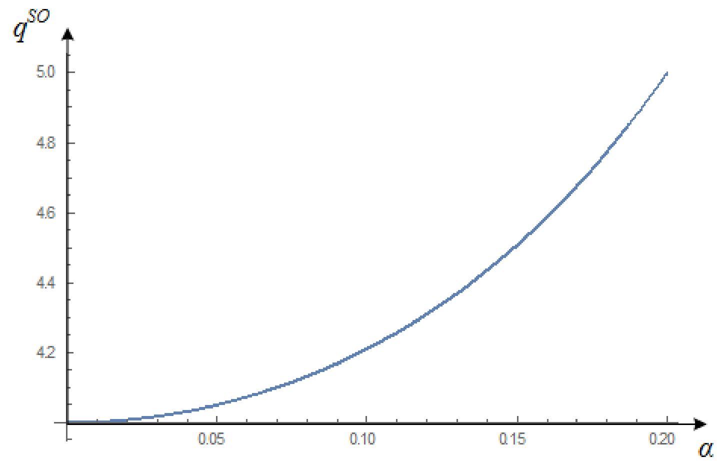

Figure 17.1. Socially optimal output with positive externalities.

  - The answer key to exercise 17.5 should be edited because the expression of q^{SO} changed in example 17.3. In particular, the answer key should read as follows: "Here the optimal output level is:

$$q^{SO} = \frac{8 - 7\alpha}{1 + 6\alpha^2}.$$

- *Second stage.* This stage is the same as in example 17.4, and we find that the monopolist's output is

$$q(t) = \frac{8 - t}{2}.$$

- *First stage.* In the first stage, the regulator wants to set a fee that induces the monopolist to produce q^{SO}, so setting the monopolist's output to the socially optimal output, we obtain

$$\frac{8 - t}{2} = \frac{8 - 7\alpha}{1 + 6\alpha^2}.$$

Multiply each side by 2, we obtain $8 - t = \frac{16 - 14\alpha}{1 + 6\alpha^2}$, and solving for t, we obtain the socially optimal fee

$$\begin{aligned} t &= 8 - \frac{16 - 14\alpha}{1 + 6\alpha^2} \\ &= \frac{8 + 48\alpha^2 - 16 + 14\alpha}{1 + 6\alpha^2}, \end{aligned}$$

which simplifies to

$$t = \frac{48\alpha^2 + 14\alpha - 8}{1 + 6\alpha^2}.$$

The emission fee is increasing in parameter α since

$$\frac{\partial t}{\partial \alpha} = \frac{14 + 2\alpha\,(16 - 7\alpha)}{(1 + 6\alpha^2)^2}$$

which is positive when the numerator is positive, that is, $14 + 2\alpha(16 - 7\alpha) > 0$ or, after rearraganging, for all $-14\alpha^2 + 32\alpha + 14 > 0$. Solving for α, we find two roots: $\alpha > -0.07$ and $\alpha < 2.36$. Since in example 17.3 parameter α must satisfy $0 \leq \alpha \leq 2$, we find that, for all admissible values of α, condition $\alpha < 2.36$ holds, and the emission fee is increasing in α.

Intuitively, as α increases, so do the external costs, so the regulator seeks to decrease output. For example, if $\alpha = 0.5$, socially optimal output becomes $q^{SO} = \frac{8-7(0.5)}{2+6(0.5)^2} = 1.28$ and the emission fee is $t = \frac{(0.5)[7+24(0.5)]}{[1+3(0.5)^2]^2} = \frac{152}{49} = \$3.10$ per unit."