31E99906 Capstone Microeconomic Policy
Instructor: Matti Liski
TA: William Ogden
Return method: through mycourses by the deadline

Problem Set 2: Question 4

Regulating pollution: prices vs. quantities. Let z denote the level of pollution. Pollution generates private utility $u(z)$, and the marginal valuation is

$$u'(z) = 10 - z. \tag{1}$$

This is the "demand" for pollution. The social cost of supply is $C(z)$, with marginal cost

$$C'(z) = 2z. \tag{2}$$

1. What is the optimal tax on pollution? Alternatively, what is the optimal quota for tradable emission rights?

2. Assume now that the demand can be either high $12-z$ or low $8-z$. The ex ante expected demand is the same as above, that is, $10-z$. Compare the two instruments (taxes vs. pollution permits) – which one should be chosen? Consider the social loss under a given instrument, and compare them.

3. In the lecture, we discussed a hybrid instrument that combines the price and quantity instruments. Describe the hybrid instrument for our example.