Activity: Public Goods
Econ 308

Brandon Lehr

1 Gruber 7.9: Estimating Crowd-Out

Let's consider why it is difficult to empirically determine the degree to which government spending crowds out private provision of public goods.

a. Discuss some challenges with interpreting a correlation between government spending and private provision of a public good in observational data.

b. Experimental investigations of crowding out can isolate the causal effect, but these experiments typically take place in laboratory environments. What are some drawbacks to this type of evidence?

2 Gruber 7.14: Private vs. Optimal Provision of Public Goods

The town of Springfield has two residents: Homer (H) and Bart (B). The town currently funds its fire department solely from the individual contributions of these residents. Each of the two residents has a utility function over private goods (X) and total firefighters (M) of the form:

$$U_H = 6\ln(X_H) + 2\ln(M)$$
$$U_B = 6\ln(X_B) + 2\ln(M)$$

The total provision of firefighters hired, M, is the sum of the number hired by each of the two persons: $M = M_H + M_B$. Homer and Bart both have income of \$100, and the price of both the private good and a firefighter is \$1. Thus, they are each limited to providing between 0 and 100 firefighters.

a. How many firefighters are hired if the government does not intervene? How many are paid for by Homer? By Bart?

$\max\ 6\ln(100 - M_H) + 2\ln(M_H + M_B)$

$0 = \frac{-6}{100 - M_H} + \frac{2}{M_H + M_B}$

$\frac{6}{100 - M_H} = \frac{2}{M_H + M_B}$

$6M_H + 6M_B = 200 - 2M_H$

$M_H = 25 - \frac{3}{4}M_B, \quad M_B = 25 - \frac{3}{4}M_H$

Symmetric $\rightarrow M_H^* = M_B^*$

$M_H^* = 25 - \frac{3}{4}M_H^*$

$M_H^* = \frac{100}{7} = M_B^*$

$M = M_H^* + M_B^* = \frac{200}{7}$

b. *Bonus.* What is the socially optimal number of firefighters? If your answer differs from (a), why?

$MRS_{(MX_H)} = \frac{1}{3}\frac{X_H}{n}$

$MRS(MX_B) = \frac{1}{3}\frac{X_B}{n}$

$\frac{200-M}{3M} = 1$

$M = 50$

Free rider problem