

Section Exercise for March 16/17: Public Goods

1) FBAH divide commodities into four boxes, depending on the degree to which they are *rival* and *excludible*. There are, of course, degrees: a good produced with increasing returns to scale, for example, is not completely *non-rival* as long as there are some extra variable costs associated with producing an extra unit. And changes in laws and regulations can affect the degree of *excludability*, as can actions individuals can take: you, for example, can make your bicycle less *non-excludible* by buying and using a good lock.

TABLE 14.1
Private, Public, and Hybrid Goods

		Nonrival	
		Low	High
Nonexcludable	High	Commons good (fish in the ocean)	Public good (national defense)
	Low	Private good (wheat)	Collective good (pay-per-view TV)

Rival and *excludible* commodities are what FBAH call *private goods*: for them it is easy to charge a price for their use (that is the definition of *excludibility*), it makes sense to charge a price equal to marginal opportunity cost for their use (because the definition of *rivalry* is that using them uses up the resources needed to produce them and so leaves the rest of society poorer), and charging such a price provides producers with enough incentive that production continues. Generally, the market provides a good societal outcome for *private goods*.

Rival and *non-excludible* commodities are what FBAH call *commons goods*: they suffer from the so-called “tragedy of the commons”. Strong government regulation to restrict appropriation and use through some mechanism is very necessary to produce a good societal outcome for *commons goods*.

Non-rival and non-excludible commodities are *public goods*: they are the proper arena of public provision by the government, although sometimes but rarely private companies can provide such *public goods* by selling some ancillary service or by in some way turning the users of the goods themselves into a product to be sold.

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Non-rival and excludible commodities are what FBAH call *collective goods*: they are the pure polar case of natural monopoly, and there is a strong argument that they should be provided by the government. But they can be provided by a private company (usually singular) even without the existence of some ancillary service or of the ability to turn the users themselves into a product to be sold.

Classify the commodities listed below. What are they predominantly: private, public, commons, or collective goods? And if they are not a pure type, add a phrase explaining why and how they are not a pure type:

1. The Bay Area's freeway-and-bridge network during rush hours.
2. The Bay Area's freeway-and-bridge network during non-rush hour times.
3. The Los Angeles Area's freeway network anytime except late at night.
4. The Interstate Highway System.
5. Antibiotics.
6. An iPhone.
7. A loaf of bread.
8. A Mazda Miata.
9. A Chevy Volt.
10. "Kocktails with Khloë [Kardashian]", a TV show.
11. "The Force Awakens", a first-run Star Wars movie.
12. Weather forecasts.
13. A college education.
14. A room at the Claremont Hotel for a night.
15. Electrical power provided by PG&E.

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2) Let's consider the demand for medical research provided by the NIH. Suppose that the annual willingness-to-pay for NIH-funded medical researchers by the average American is:

$$P = \$0.10 - Q/400000$$

up to 40,000 researchers, and zero thereafter

Where P is the willingness-to-pay and Q is the number of medical researchers funded by the NIH. There are 300 million Americans

a) Suppose that it costs \$1,000,000/year to pay and deploy an NIH medical researcher in a laboratory. What is the socially-optimal number of medical researchers the NIH should fund?

b) What is the consumer surplus generated by the NIH deploying medical researchers at the appropriate scale? What is the net total surplus?

c) How much is the first medical researcher worth to society?