Chapter 15: Public Goods and Tax Policy

A. Definitions of public and private goods

public sector: government
private sector: businesses, individuals

A *nonrival* good is one whose consumption by one person does not diminish its consumption by others

Example: clean air is a nonrival good

Example: a hamburger is a rival good

A *nonexcludable* good is one where it is difficult to prevent people from consuming it once it has been produced

Example: national defense is a nonexcludable good

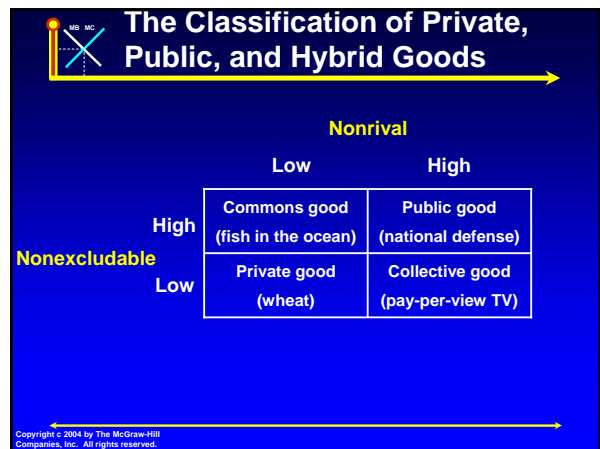Example: seeing a movie at the theater is an excludable good

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- Many goods are both nonrival and nonexcludable
- If a good is both nonrival and nonexcludable, it is called a *public good*
- Examples: clean air and national defense are public goods

- Many other goods are both rival and excludable
- If a good is both rival and excludable, it is called a *private good*
- Examples: a hamburger or seeing a movie in the theater are private goods

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- Some goods can be rival but nonexcludable
- Example: catching a fish in the ocean
- a good that is rival but nonexcludable is called a *commons good*

- Yet other goods may be nonrival but excludable
- Example: watching a movie on HBO is nonrival but excludable
- a good that is nonrival but excludable is called a *collective good*


The Classification of 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)

Chapter 15: Public Goods and Tax Policy

A. Definitions of public and private goods
B. Valuing public goods

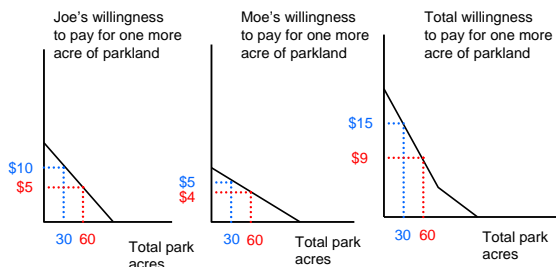Principle for valuing public goods:
   willingness to pay

For a private good, the total willingness to pay is horizontal summation of each individual demand curve

Joe's hamburger demand

Moe's hamburger demand

Total hamburger demand

$5
$3
1 2

$5
$3
1

$5
$3
1   3
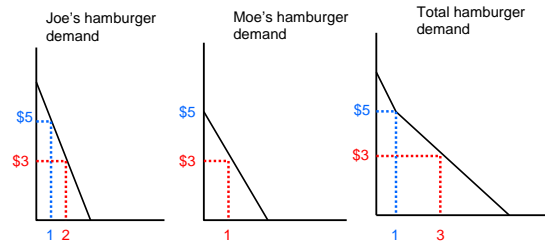
If price is $5 per hamburger, market demand is 1 (Joe buys 1, Moe buys 0)
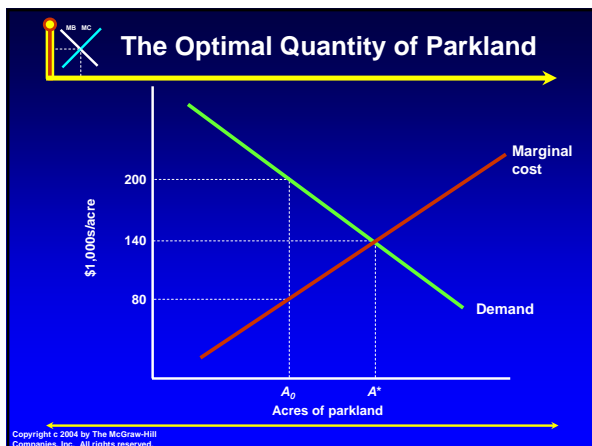If price is $3 per hamburger, market demand is 3 (Joe buys 2, Moe buys 1)

For a public good, the total willingness to pay is vertical summation of each individual demand curve

Joe's willingness to pay for one more acre of parkland

Moe's willingness to pay for one more acre of parkland

Total willingness to pay for one more acre of parkland

$10
$5
30 60   Total park acres

$5
$4
30 60   Total park acres

$15
$9
30 60   Total park acres

If city has 30 acres, Joe is willing to pay $10 for one more acre and Moe is willing to pay $5 for one more acre, so city as a whole is willing to pay $15

If city has 60 acres, Joe is willing to pay $5 for one more acre and Moe is willing to pay $4 for one more acre, so city as a whole is willing to pay $9


Socially optimal level of a public good:
   set marginal willingness to pay for one more unit of the good equal to the marginal cost of producing one more unit

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MB MC
The Optimal Quantity of Parkland

Marginal cost

200

$1,000s/acre

140

80

Demand

A_0 A^*
Acres of parkland

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A. Definitions of public and private goods
B. Valuing public goods
C. Problems with private provision of public goods
   1. Underprovision of public goods by the private market

If individuals have to pay for the good on their own, little or none of the good would be produced

$/unit

marginal cost

total willingness to pay

Joe's willingness to pay

socially optimal quantity

Quantity
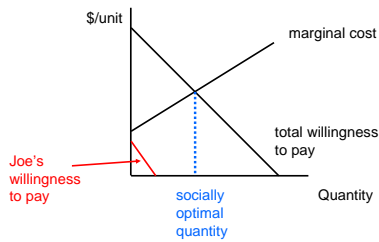
Conclusion:

We would typically conclude that public goods need to be provided by the government rather than by the private sector

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On the other hand, if there is a big inefficiency from underprovision of a public good, there is a strong incentive for the private market to develop ways to make the good excludable

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Examples of making good excludable

(1) Technological advance made downloading music from the web essentially a public good

In response, record companies developed technologies to make it excludable

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Examples of making good excludable

(2) Some households might want more police protection or parkland than is provided by the city

In response, private developers have built gated communities with large public areas

Santaluz

In other cases, a firm may find a way to make a profit even if the good is nonexcludable by sale of by-products

Examples of sale of by-products

(1) selling advertising on television

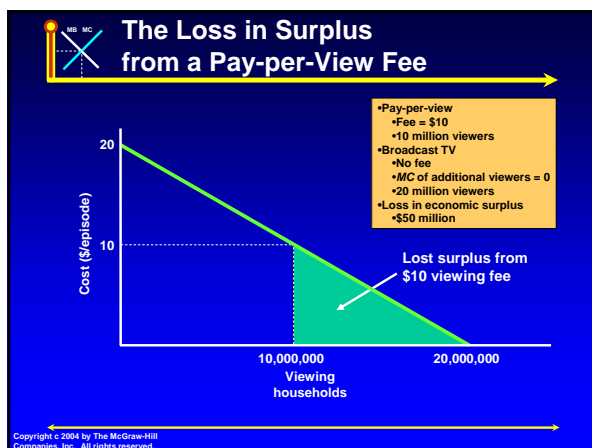## Examples of sale of byproducts

(2) Sales of Sesame Street related merchandise exceed $800M annually

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   1. Underprovision of public goods by the private market

   2. Underprovision of collective goods by the private market

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- Social optimality: marginal cost = marginal benefit
- Nonrival good: marginal cost of delivering unit to one more customer is zero
- By charging customers to receive a good that could be delivered to them at zero marginal cost, too little of the collective good is produced

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The Loss in Surplus from a Pay-per-View Fee

- Pay-per-view
  - Fee = $10
  - 10 million viewers
- Broadcast TV
  - No fee
  - *MC* of additional viewers = 0
  - 20 million viewers
- Loss in economic surplus
  - $50 million

Lost surplus from $10 viewing fee

Cost ($/episode)

20

10

10,000,000 Viewing households

20,000,000

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D. Paying for provision of public goods

If public good is to be provided by the government, it will be paid for with taxes

Who should pay the taxes, if this is the justification for the government's involvement?

Ideal answer– suppose that:
- Public goods are being provided at the point where MC = MB (social optimum)
- MB = vertical sum of each individual's willingness to pay

Then if each individual contributed the amount they are willing to pay, we would just cover the costs

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Conclusion:
  Ideal solution is for each individual to be taxed proportionate to the amount they personally are willing to pay for the public good

Problem:
  How could we ever determine the willingness to pay?

Measuring WTP

- Hedonic pricing
  - Public good is "bundled" with some privately sold good (e.g., a house) where quantity of public good varies
- Household production function
  - Public good is an input to a larger production process
- Contingent valuation/stated preference surveys
  - Create the missing market in a survey
- Put provision of the public good on the ballot
  - Create the missing market in a voting context

Reasonable assumption: the rich are willing to pay more than the poor

Conclusion: if government expenditures are motivated by a public goods argument, then the rich should pay more taxes than the poor

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Question: how much more taxes should the rich pay?
- If when your income doubles your taxes less than double, the tax system is called regressive
- If when your income doubles your taxes exactly double, the tax system is called proportional
- If when your income doubles your taxes more than double, the tax system is called progressive

- Many studies have concluded that the income elasticity of people's demand for parks, clean air, public safety is greater than 1
- That is, if your income doubles, the amount you'd be willing to pay for such items more than doubles
- Some economists use this to argue that a progressive tax system is the logical way to pay for the government's bills

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A. Definitions of public and private goods

nonrival: my consumption doesn't reduce yours

nonexcludable: I can't be prevented from consuming

public: nonrival and nonexcludable (e.g., clean air)

private: rival and excludable (e.g., hamburger)

commons (hybrid): rival and nonexcludable (e.g., fish in ocean)

collective (hybrid): nonrival and excludable (e.g., pay-per-view TV)

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marginal benefit = vertical sum of all individual marginal willingness to pay

social optimum: MB = MC

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C. Problems with private provision of public goods

Both public goods and collective goods are likely underprovided by the private market

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C. Problems with private provision of public goods

D. Paying for provision of public goods

- Ideal solution is for each individual to be taxed an amount proportional to what he or she personally is willing to pay for the public good
- If income elasticity of demand for parks, clean air, public safety is greater than 1, then should pay for public goods with progressive tax structure

However, any taxes will be distortionary and
   impose deadweight losses by themselves

Must weigh problem of insufficient provision
   of public goods by private markets against
   problem of misallocation of resources
   caused by taxes