

# Lec 5: Public Goods

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# Public Goods

- Optimal Provision of Public Goods
- Private Provision of Public Goods
- Public Provision of Public Goods
- Conclusion

## Public Goods: A taxonomy

- **Pure public goods** : Goods that are perfectly non-rival in consumption and are non-excludable.
  - **Non-rival in consumption** : One individual's consumption of a good does not affect another's opportunity to consume the good.
  - **Non-excludable** : Individuals cannot deny each other the opportunity to consume a good.
- **Impure public goods** : Goods that satisfy the two public good conditions (non-rival in consumption and non-excludable) to some extent but not fully .

## Defining Pure and Impure Public Goods

		<b>Is the Good Rival in Consumption?: (Yes)</b>	<b>Is the Good Rival in Consumption?: (No)</b>
<b>Is the Good Excludable?</b>	(Yes)	Private good (ice cream)	Impure public good (TV streaming)
<b>Is the Good Excludable?</b>	(No)	Impure public good (crowded city sidewalk)	Pure public good (national defense)

# Optimal Provision of Public Goods: Introduction

How much of the public good should society provide?

- Markets will not provide the correct amount.
- To answer this question, start by reconsidering the market for a private good like ice cream cones.
- Ben and Jerry have different tastes for ice cream ( $ic$ ) relative to the other good ( $c$ ). How does the market aggregate their preferences ?

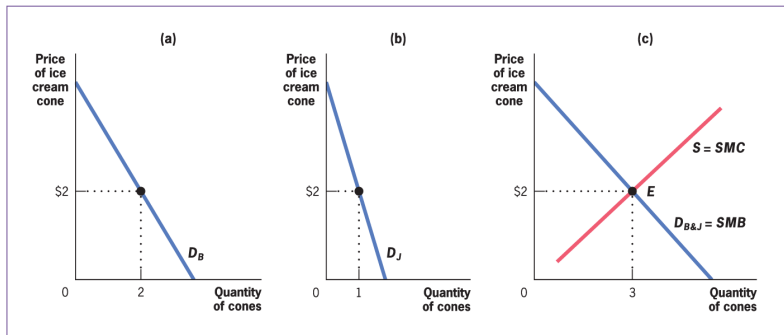
# Optimal Provision of Private Goods

- Two goods:  $ic$  (ice-cream) and  $c$  (cookies) with prices  $P_{ic}, P_c$
- $P_c = 1$  is normalized to one (num'eraire good):
- Two individuals  $B$  and  $J$  with different demand.
  - $MRS_{ic,c} = MU_{ic}/MU_c = \#$  cookies the consumer is willing to give up for 1 ice-cream
  - The optimality condition for the consumption of private goods is written as:  $MRS_{ic,c}^B = MRS_{ic,c}^J = P_{ic}/P_c = P_{ic}$

## Optimal Provision of Private Goods

- Equilibrium on the supply side requires:  $MC_{ic} = P_{ic}$
- In equilibrium, therefore:  $MRS_{ic,c}^B = MRS_{ic,c}^J = MC$

# Horizontal Summation in Private Goods Market



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- To find the total demand curve, add quantity at each price (sum horizontally)!

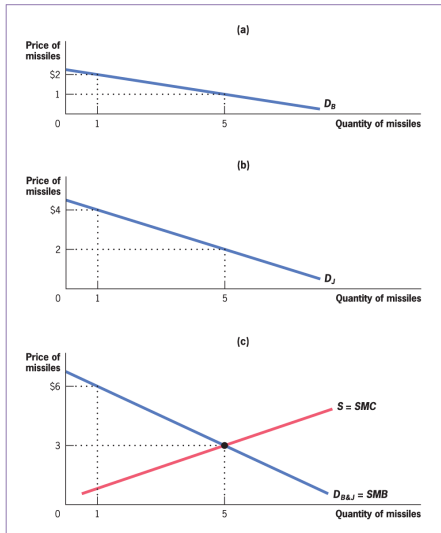
## Optimal Provision of Public Goods

- With public goods, such as missiles (  $m$  ), Ben's consumption doesn't reduce Jerry's.
- Therefore the social-efficiency-maximizing quantity solves

$$MRS_{m,c}^B + MRS_{m,c}^J = MC$$

- Social efficiency is maximized when the marginal cost is set equal to the sum of the  $MRS$ s rather than being set equal to each individual's  $MRS$  .

# Vertical Summation for Public Goods



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## Numerical Example

Assuming there are only two consumers in the market for good  $x$ , whose demand are given by  $q = 20 - 4P$  and  $q = 15 - P$ . Further assume that the that the MC of producing  $x$  is \$2.

find the efficient amount of  $x$  that should be produced:

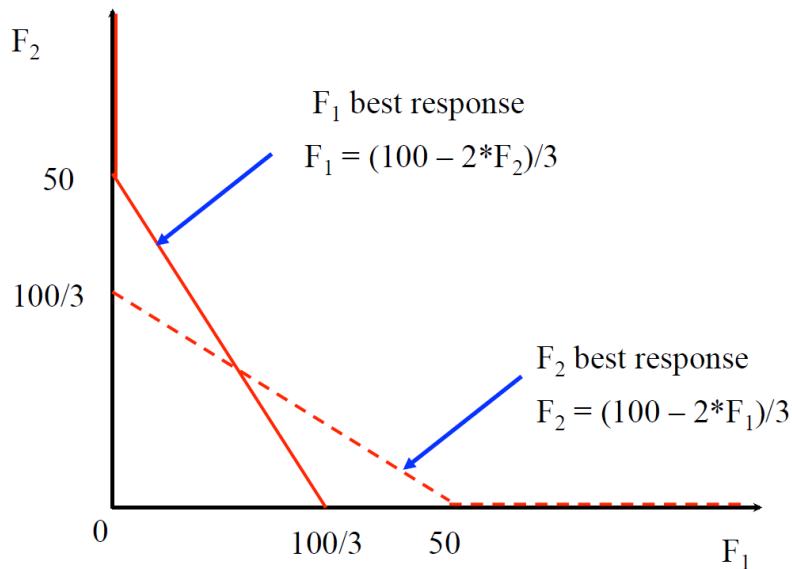
- a. if  $x$  was smart phones
- b. if  $x$  was local police service

# Private Provision of Public Goods: Private-Sector Underprovision

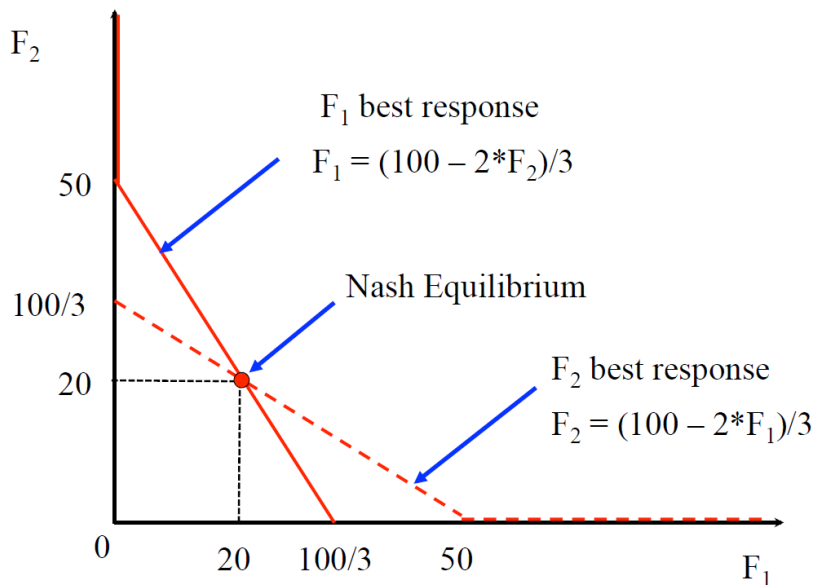
The market does not produce the efficient amount of public goods because of the free rider problem.

- **Free rider problem:** When an investment has a personal cost but a common benefit, individuals will underinvest.
- Since Ben's consumption of missiles also benefits Jerry, Jerry may not want to pay (or vice versa).
- This results in the private market producing an inefficiently low quantity of the good .

## Public good is under-provided by the market



## Public good is under-provided by the market



# APPLICATION: The Free Rider Problem in Practice

- The free rider problem is one of the most powerful concepts in all of economics.
- **Provision of Fire Services:**
  - Until 2013, fire services in Victoria, Australia, were financed by a tax on fire insurance policies. Individuals who did not insure still received services.
  - In 2013, Victoria moved to financing fire services through property taxes in order to address this issue.

# Can Private Providers Overcome the Free Rider Problem?

- The free rider problem does not lead to a complete absence of private provision of public goods.
- When private suppliers are given the ability to overcome the problem of non-excludability, they can produce the efficient quantity of the good.
- The private sector can in some cases combat the free rider problem to provide public goods by charging user fees that are proportional to their valuation of the public good .

# APPLICATION: Business Improvement Districts 1

Clean, safe sidewalks are public goods.

- Cities attempt to provide them through street repair and police work, financed with tax revenue.
- But New York City's Times Square in the 1980s was a failure:
  - "Dirty, dangerous, decrepit, and increasingly derelict"
  - In 1992, a group of private firms formed a **Business Improvement District** to improve the area themselves .

## APPLICATION: Business Improvement Districts 3

Resounding success:

- Crime has dropped significantly.
- The area is cleaner and more attractive.
- Business and tourism are booming.
- Success of BIDs depends on the legal underpinnings: Can members charge fees to encourage payment?
  - The BID entity overcame the public goods problem by overcoming the non-excludable assumption. They received government permission to (potentially) charge, via a tax, all consumers .

## When Is Private Provision Likely to Overcome the Free Rider Problem?

Markets can (mostly) overcome the free rider problem when some individuals care more than others.

- Suppose Ben cares much more about fireworks than Jerry.
- Then, Ben will want to buy a lot of fireworks for himself ( $MRS^B = MC_f$ ).
- And the efficiency loss is small: ( $MRS^B \approx MRS^B + MRS^J$ ).

# Altruism and Social Capital

- Private markets provide public goods when people are altruistic.
- **Altruistic:** When individuals value the benefits and costs to others in making their consumption choices.
  - Many laboratory experiments provide evidence for altruism and show that people contribute to public goods.
- **Social capital:** The value of altruistic and communal behavior in society.

## Warm Glow

- People might simply feel good about contributing to public goods or charity.
- **Warm glow model:** A model of the public goods provision in which individuals care about both the total amount of the public good and their particular contributions as well.
- Different from altruism because people don't care about just the amount of the public good .

## Active Learning

Which of these does NOT reduce the problem of underprovision of public goods?

- a. business improvement districts
- b. government intervention
- c. social capital
- d. vertical summation

# Public Provision of Public Goods

Even with private provision, there is a role for government provision of public goods.

- Under private provision, not everyone contributes to the good, even though everyone benefits.
- Government provision potentially solves the problem of noncontributors.
- Nonetheless, there are several challenges to government provision .

# Private Responses to Public Provision: The Problem of Crowd-Out

- **Crowd-out:** As the government provides more of a public good, the private sector will provide less .
- In full crowd-out, government intervention accomplishes nothing because an increase of 5 units provided by the government results in a decrease of 5 units provided privately. (this is rare)

## Contributors Versus Noncontributors

- Here Government provision is financed by payments by private individuals.
- By forcing noncontributors to contribute to the fund for public provision, the government can increase total public goods provision. (Public radio in some countries)

## Warm Glow and the Evidence on Crowd-Out

- If you get utility from your particular contributions for any reason (warm glow), then an increase in government contributions will not fully crowd out your giving.
  - If you only care about how much you give, government contributions have no effect on your giving.
- Existing evidence on crowd-out is quite mixed.

# The Right Mix of Public and Private

- One extreme is provision entirely by the public sector.
- The other extreme is subsidized or mandated private provision, with the government providing incentives.
- **Contracting out:** An approach through which the government retains responsibility for providing a good or service but hires private-sector firms to actually provide the good or service .

## APPLICATION: The Good Side of Contracting Out

- Contracting out public goods to private companies may or may not work to deliver public goods efficiently.
- **Commonwealth Care** provided by a winner of managed care organizations (MCO) bidding was competitive and cost effective

# APPLICATION: The Bad Side of Contracting Out

- **Private Prisons**

- Roughly 10% cheaper, but this was achieved by paying lower wages to prison guards, resulting in lower-quality guards and higher instances of violence.

- **Halfway houses:** New Jersey's halfway houses offer assistance to newly released inmates to ease the transition back into society. (Cheap but without supervision resulted in increased violence)

# Measuring the Costs and Benefits of Public Goods

- Optimal public good provision requires being able to measure both the benefits and the costs of providing public goods. In practice, this is quite difficult both on the cost and benefit side.
  - Cost side: opportunity cost is difficult to measure
  - Benefit: time and people's life saved or wasted due to highway construction
- These difficult questions are addressed by the field of *cost-benefit analysis* , which provides a framework for measuring the costs and benefits of public projects.

# Measuring Preferences for Public Good?

Three challenges in measuring preferences for public goods.

1. *Preference revelation* : People may not want to reveal their true valuation because the government might charge them more for the good if they say that they value it highly.
2. *Preference knowledge* : People may not know what their valuation is.
3. *Preference aggregation* : How can the government combine the preferences of millions of citizens ?
  - These problems are addressed by the field of *political economy*, the study of how governments go about making public policy decisions, such as the appropriate level of public goods.

# ACTIVE LEARNING

Which of these are issues in finding the optimal level of public provision of public goods?

I. measuring preferences II. measuring costs III. noncontributors

- a. I & II only
- b. I & III only
- c. II & III only
- d. I, II, & III

# Conclusion

- A major function of governments at all levels is the provision of public goods.
- Sometimes the private sector can provide public goods but usually not the optimal amount.
- Government intervention can potentially increase efficiency.
- Success of intervention depends on the:
  - Ability of government to measure costs and benefits.
  - Ability to implement optimal plan .