Introduction to Cost-Benefit Analysis

Issues to discuss:

- Rationale for Public Actions
  - "Public" means: not private firms/individuals
  - Governments, NGOs, foundations, etc.
- Procedures for Valuation
- Problems of Valuation
- Use as a Planning Tool

Rationales for Public Actions

A. Public goods

Goods or services that are not provided by private suppliers because of their nature

1. Nonexcludable goods

Impossible (or very costly) to exclude individuals from consuming (using) the good

– Examples?

- Roads, bridges
- Parks/preserves
- Police/fire protection
- Open water fisheries

Rationales for Public Actions

2. Non-rival goods

   One person's consumption of a good does not prevent someone else from consuming

- Examples?
  - Defense
  - Street lights
  - Flood control

Rationales for Public Actions

3. Complementary goods in consumption

   The utility of one person's consumption depends on consumption levels of others

– Examples?
  – Public Health

Rationales for Public Actions

- Private sector will not provide public goods, because they are not able to capture benefits through markets.
  - Free rider problem

Rationales for Public Actions

B. Market Failure

Private sector production may not be efficient

Marginal costs of production not equal to marginal benefits to society

1. Externalities – spillover effects from production or consumption, that the producer/consumer does not have to pay for

Rationales for Public Actions

- Positive externalities
  - Benefits to society for which potential producers are not compensated.
  - Examples?
    - Research
- Negative externalities
  - Costs to society that producers do not need to pay for
  - Examples?
    - Pollution

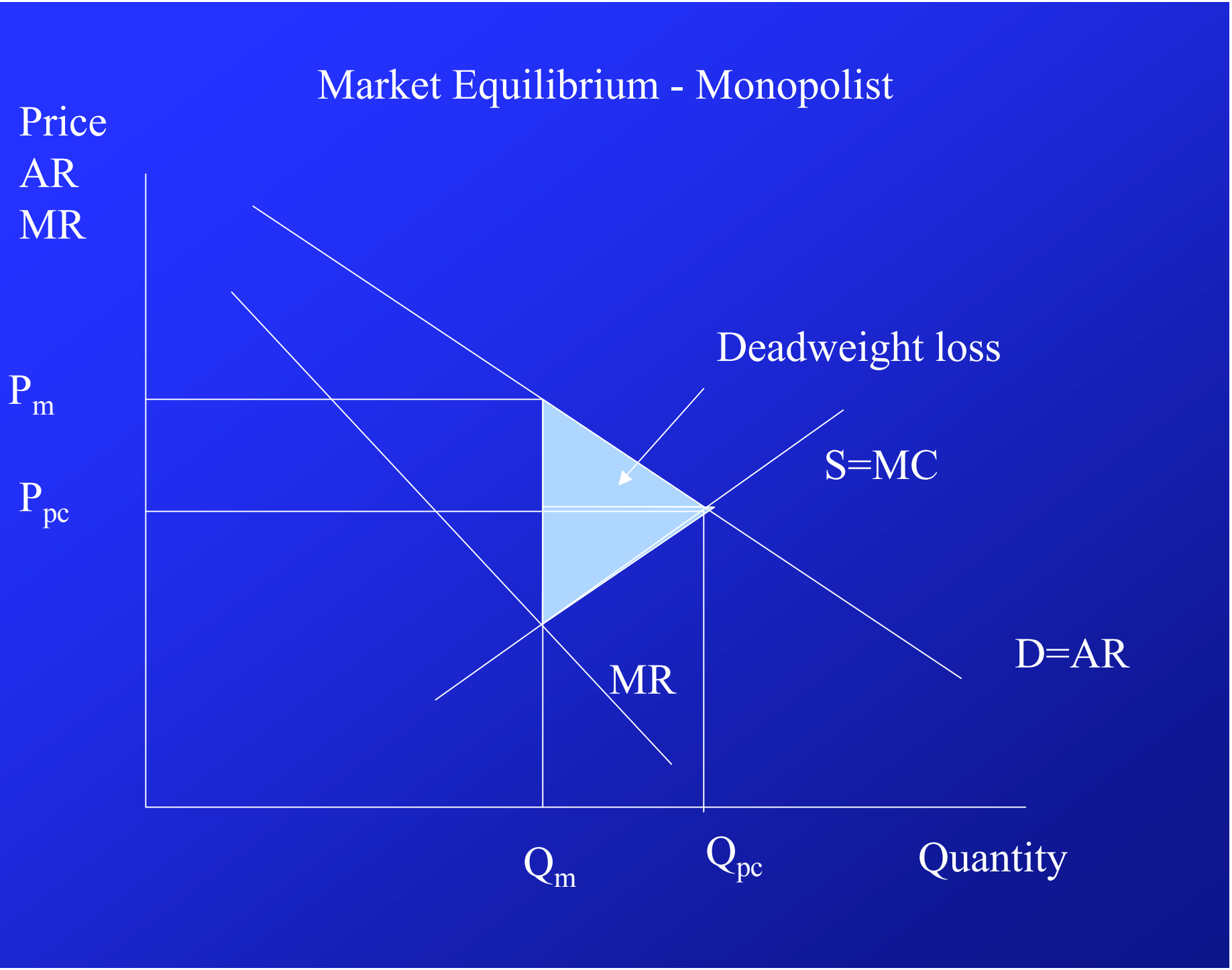
Rationales for Public Actions

- Negative externalities are over-produced and positive externalities are under-produced by private sector
  - Public actions to address negative externalities:
    - Regulation
    - Taxes
    - Tradable permits (create a market)
  - Public actions to address positive externalities:
    - Government investment
    - Subsidies / grants to private organizations

Rationales for Public Actions

2. Imperfect competition
   - Producers have market power
     - Monopoly
     - Monopsony
   - Producers can affect market price
   - Profit maximization: MR=MC
   - But for monopolists, P > MR, so P > MC
   - Monopolists "under produce" at net economic cost to economy

Market Equilibrium - Monopolist



Rationales for Public Actions

- Market power – in industries with barriers to entry
  - Economies of scale
- Public actions to address imperfect competion:
  - Direct government control (public enterprises)
  - Regulation of private firms

Rationales for Public Actions

C. Non-efficiency goals: Income distribution

- Private market system does not ensure any particular pattern of income distribution
  - Many people consider that a more equal distribution of wealth and income is more “just” or “fair” than an unequal distribution.
- Based on concerns about fairness, many people consider that individuals’ “rights” of access to basic goods and services (health, education),should not depend on their income levels.

Rationales for Public Actions

- Governments must provide public goods
  - (otherwise they will not be provided at all)
- Addressing market failures and non-efficiency goals, such as income distribution, is optional.

Rationales for Public Actions

- Different countries take different policy approaches to address market failures, income distribution
  - US
  - Western Europe
  - Centrally Planned Economies
- Countries change policy approaches over time
  - Disappearance of Centrally planned/socialist economies
  - Changes in US regulation of business activities

Procedures for Valuation

- Like firms and individuals, governments face budget constraints:
  - Cannot undertake all projects with positive net benefits
  - Need to establish priorities across potential projects

Procedures for Valuation

- CBA – uses money as means for measuring all costs and benefits
  - Fundamental measure of benefits – increase in individuals' well-being
    - ***Willingness to Pay (WTP) – MEASURED IN MONEY!***
  - Fundamental measure of costs – loss in individuals' well-being
    - ***Opportunity cost – forgone benefits***

Procedures for Valuation

- CBA Decision rule:
  - Any project where benefits (WTP) greater than costs (foregone benefits) has the ***potential*** to provide pareto improvement to economy.
    - Pareto improvement: At least one person better off, and nobody made worse off.
  - Rank projects according to benefit/cost ratio.
  - Invest scarce resources in projects with the highest benefits/cost ratio.

Complications in CBA

- Aggregation of benefits and costs across individuals
  - For moral or ethical reasons, we may place different valuation of one dollar of income for different individuals:
    - Income level
      - Different value of income for poor vs. rich individuals
    - Gender
      - Different value of income to men vs. women
    - Regional disparities
      - Different value of income to rich vs poor regions, or regions with different levels of unemployment.

Complications in CBA

- Market costs may not reflect "social" costs
- Reasons?
  - Non-competitive markets
  - Externalities
  - Market distortions from government policies
    - Taxes
      - Farmers pay $1 for fertilizer, but government provides subsidy of 0.50, so true cost to economy is $1.50

Complications in CBA

- Non-marketed goods -- NO market price
  - Value of providing defense
  - Value of public amenities
  - Value of transport network
- Procedures for approximating market values
  - Look at related or component markets
  - Valuation of hypothetical conditions – survey consumers

Complications in CBA

- Risk
  - Expected values
- Uncertainty
  - Sensitivity Analysis

Complications in CBA

- Some projects/policies address efficiency objectives:
- Examples?
  - Provision of public goods
  - Correcting effects of positive or negative externalities

Complications in CBA

- Some address non-efficiency objectives
- Examples?
  - Income distribution
  - Employment creation
  - Development of priority regions
  - National security
  - Environmental quality
  - Species preservation

Complications in CBA

- Standard CBA provides only one component of the multi-objective decision analysis – the efficiency objective.
  - Formal, informal approaches for multi-objective analysis
  - In fact, these decisions are made through political process of negotiation among interest groups
- But NOT an argument against the value of CBA
  - Only the limitations of CBA

Use of CBA as planning tool

- CBA forces systematic assessment of all the dimensions of a potential project/policy (feasibility):
  - Technical feasibility
  - Commercial feasibility
  - Social implications
  - *Institutional/Organizational*

Use of CBA as planning tool

- Forces to compare with alternative uses of limited resources (efficiency)