

Environmental and Health Economics ECON/ENVR/SOSC 2310

Guojun He
2019 Spring



Three Types of Questions in Economics

- A. How People Make Decisions?
- B. How People Interact?
- C. How the Economy as a Whole Works?



Mankiw's Ten Principles of Economics

A. How People Make Decisions?

1. People face tradeoffs.



1. People face tradeoffs

- To get one thing, we usually have to give up another thing.
- Resources are scarce!
 - Food vs. clothing
 - Leisure time vs. work



1. People face tradeoffs

- Society Faces tradeoffs:
 - Efficiency vs. Equity
 - Efficiency means society gets the most that it can from its scarce resources.
 - Equity means the benefits of those resources are distributed fairly among the members of society.
 - More consumer goods (low taxes) vs more public goods (defense, social programs)
 - Sometimes a tradeoff between the environment and jobs



Mankiw's Ten Principles of Economics

A. How People Make Decisions?

1. People face tradeoffs.
2. The cost of something is what you give up to get it.



2. The cost of something is what you give up to get it.

- Decisions require comparing costs and benefits of alternatives.
 - Whether to study or go out on a date?
 - Whether to go to class or sleep in?
- The opportunity cost of an item is what you give up to obtain that item.



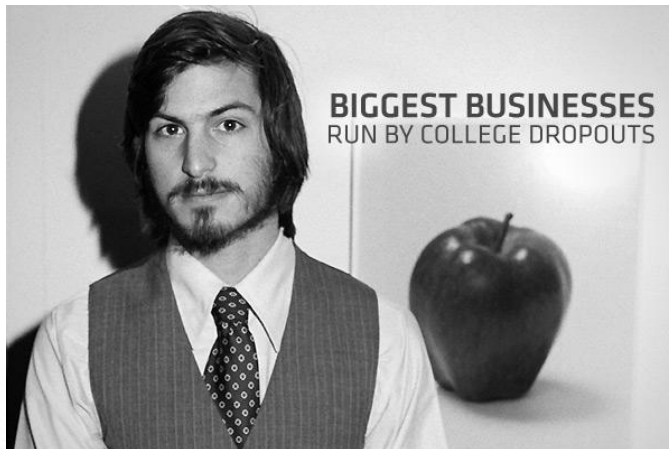
Questions

- What is the opportunity cost of going to college?



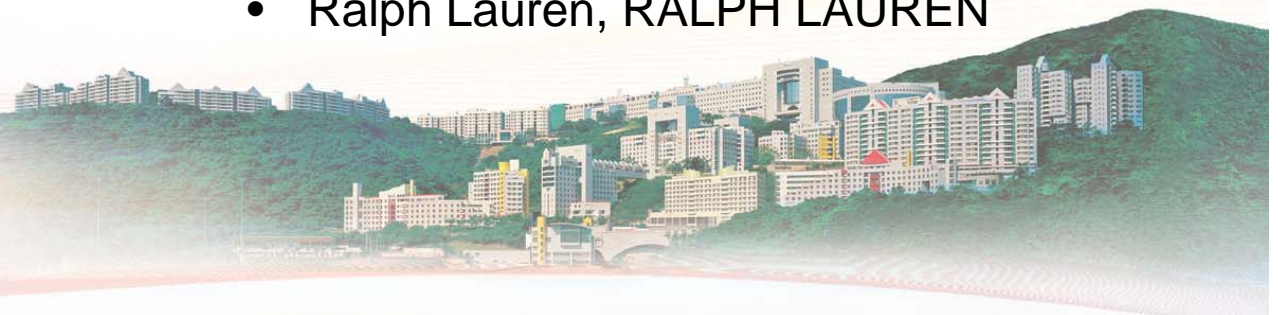
College Education

- Costs besides “out of pocket” costs like tuition and books:
- 4 years' lost earnings



Businesses Run by College Dropouts

- Steve Jobs, APPLE
- Mark Zuckerberg, FACEBOOK
- Bill Gates and Paul Allen, MICROSOFT
- Michael Dell, DELL
- Richard Branson (High-school Dropout), VIRGIN GROUP
- Ralph Lauren, RALPH LAUREN



Question

- You are trying to decide whether to take a vacation. Most of the costs of the vacation (air-fare, hotel, and forgone wages) are measured in dollars, but the benefits of the vacation are psychological. How can you compare the benefits to the costs?



Mankiw's Ten Principles of Economics

A. How People Make Decisions?

1. People face tradeoffs.
2. The cost of something is what you give up to get it.
3. Rational people think at the margin.



3. Rational people think at the margin

- Marginal changes are small, incremental adjustments to an existing plan of action.
(math: derivatives)

People make decisions by comparing costs and benefits at the margin.



3. Rational people think at the margin

- Imagine a student who is pondering whether she should add one more course next semester. She, as a rational decision-maker, will add the extra course as long as her marginal benefits from carrying one more course exceeds her expected marginal costs.



Question

- Water is necessary for life. Is the marginal benefit of a glass of water large or small?



Rational People Think at the Margin? North vs South Differences



Mankiw's Ten Principles of Economics

A. How People Make Decisions?

1. People face tradeoffs.
2. The cost of something is what you give up to get it.
3. Rational people think at the margin.
4. People respond to incentives.



4. People respond to incentives

- If gas becomes more expensive, people adjust their behavior.
- Public policies can affect private incentives, often in unintended ways.
- Seat belt laws:
 - Direct effect: survive an accident; save lives
 - Indirect effect: accidents are now less costly, so the new cost-benefit calculation causes drivers to drive faster



4. People respond to incentives

- Seat belt laws:
 - One 1975 study found that the laws led to more accidents, but fewer driver deaths per accident.
 - Overall driver deaths remained about the same but pedestrian deaths increased.
- Anderson and Auffhammer, 2014, “Pounds that Kill”.
 - Heavier vehicles are safer for their own occupants but more hazardous for other vehicles.
 - Being hit by a vehicle that is 1000 pounds heavier generates a 40–50% increase in fatality risk.
 - An unregulated vehicle fleet is inefficiently heavy.



4. People respond to incentives

- **Marginal changes** in costs or benefits motivate people to respond.

The decision to choose on alternative over another occurs when that alternative's marginal benefits exceed its marginal costs



Example

- Suppose you are an airline executive deciding whether to sell a standby ticket for \$300. The 200 seat plane is nearly sold out, and the total costs for the flight are \$100,000, or an average cost of \$500.
- Should you sell a standby seat "below cost"? Yes, since the marginal benefit, \$300, exceeds the marginal cost (cost of peanuts, soda, extra fuel costs, discomfort due to congestion--at most \$20).
- A rational decision maker (who can finely adjust his/her action) chooses the level of action where the marginal benefit equals the marginal cost.



Mankiw's Ten Principles of Economics

B. How People Interact?

5. Trade can make everyone better off.



5. Trade can make everyone better off

- Don't think of trade as having one side win and the other side lose. No one is forcing people to trade, so both sides think they benefit.
- Trade involves competition. Your family competes with other families in the job market and in the grocery store. Yet, not allowing trade would make everyone worse off.



Bargaining between Sellers and Buyers



5. Trade can make everyone better off

- People gain from their ability to trade with one another.
- Competition results in gains from trade.
- Trade allows people to specialize in what they do best.
- ***The same point applies to trade between countries.***



Trade can make everyone better off



TheFreemanOnline.org



Question

- Your roommate is a better cook than you are, but you can clean more quickly than your roommate can. If your roommate did all the cooking and you did all the cleaning, would your chores take you more or less time than if you divided each task evenly?



Question

- Now suppose your roommate cooks better and also cleans the room faster than you.
- Will your answers to above questions change?



Comparative Advantage

- An agent has a **comparative advantage** over another in producing a particular good if he can produce that good at a lower relative *opportunity cost*.
- David Ricardo (1817): why countries engage in international trade even when one country's workers are more efficient at producing every single good than workers in other countries?



Comparative Advantage

- David Ricardo: countries should specialize in the good that they have the lowest opportunity costs in, and by doing this it makes everyone better off.
- An Example: Apple and Pear Production in Australia and UK



Comparative Advantage

- UK: Produce 10 apples, or 5 pears using one hour of labor.
- Australia: 6 apples, or 4 pears using one hour of labor.
- UK has absolute advantage in producing both goods.



Comparative Advantage

- If both countries divide their time equally between producing apples and pears.
- 1 Hour of Labor:
 - UK: 5 apples, 2.5 pears
 - Australia: 3 apples, 2 pears
 - In total: 12.5 pieces of fruits
- Opportunity costs of producing 1 pear:
 - UK: 2 apples
 - Australia: 1.5 apples



Comparative Advantage

- Australia has comparative advantage in producing pear because it has lower opportunity cost.
- If UK only produces apple, and Australia only produces pear. What is the result?



Mankiw's Ten Principles of Economics

B. How People Interact?

- 5. Trade can make everyone better off.
- 6. Markets are usually a good way to organize economic activity.



6. Markets are usually a good way to organize economic activity

- In a market economy, households decide what to buy and who to work for.
- Firms decide who to hire and what to produce.
- Adam Smith: households and firms interacting in markets as if guided by an “invisible hand”.



6. Markets are usually a good way to organize economic activity

- Households and firms look at prices when deciding what to buy and sell, they unknowingly take into account the social costs of their actions.
- As a results, prices guide decision makers to reach outcomes that tend to maximize the welfare of society as a whole.



6. Markets are usually a good way to organize economic activity

- The "invisible hand": Everyone, by acting selfishly, does their part in maximizing the welfare of society as a whole.

“It is not from the benevolence of the butcher, the brewer, or the baker that we expect our dinner, but from their regard to their own self-interest. We address ourselves not to their humanity but to their self-love, and never talk to them of our own necessities, but of their advantages”

– Adam Smith, *An Inquiry into the Nature & Causes of the Wealth of Nations*, Vol 1



6. Markets are usually a good way to organize economic activity

- Other ways to allocate scarce resources:
 - Waiting in a line
 - Government Mandates
 - War
- Do you think there are better ways to allocate scarce resources?
- Can you image other ways to allocate scarce resources?



Planned Economy vs. Market Economy

马克思主义讲到的市场经济和计划经济到底哪个好？我认为这个观念我们过去的100多年来一直觉得市场经济非常之好，我个人看法未来30年会发生很大的变化，计划经济将会越来越大... 相信数据时代我们对国家和世界的经济、数据明确掌握，就像对世界经济我们将会有一个X光机和CT机，所以30年以后将会有新的理论出来...

马云，阿里巴巴
--Jack Ma, Alibaba



Big data and AI will make the planning and predictions possible; and thus the planned economy will grow bigger?



Planned Economy vs. Market Economy

- Entrepreneurship, Uncertainty of Innovation
- Information
- Incentive



6. Markets are usually a good way to organize economic activity

- Old Soviet Union and Mainland China before economic reforms:
 - Firms are told what inputs they will receive and the output they are required to produce.
 - Households are sometimes told what they will be able to consume.
 - Information problem and incentive problem.



Mankiw's Ten Principles of Economics

B. How People Interact?

- 5. Trade can make everyone better off.
- 6. Markets are usually a good way to organize economic activity.
- 7. Governments can sometimes improve market outcomes



7. Governments can sometimes improve market outcomes

- When the market fails, government can intervene to promote efficiency and equity.

Market failure occurs when the market fails to allocate resources efficiently.

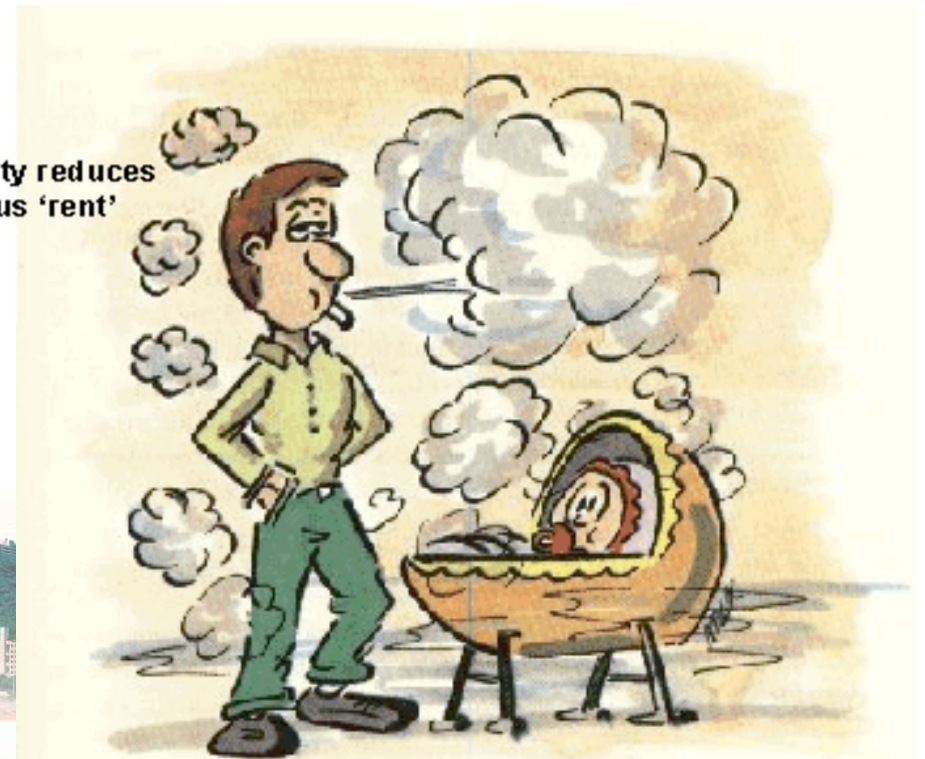
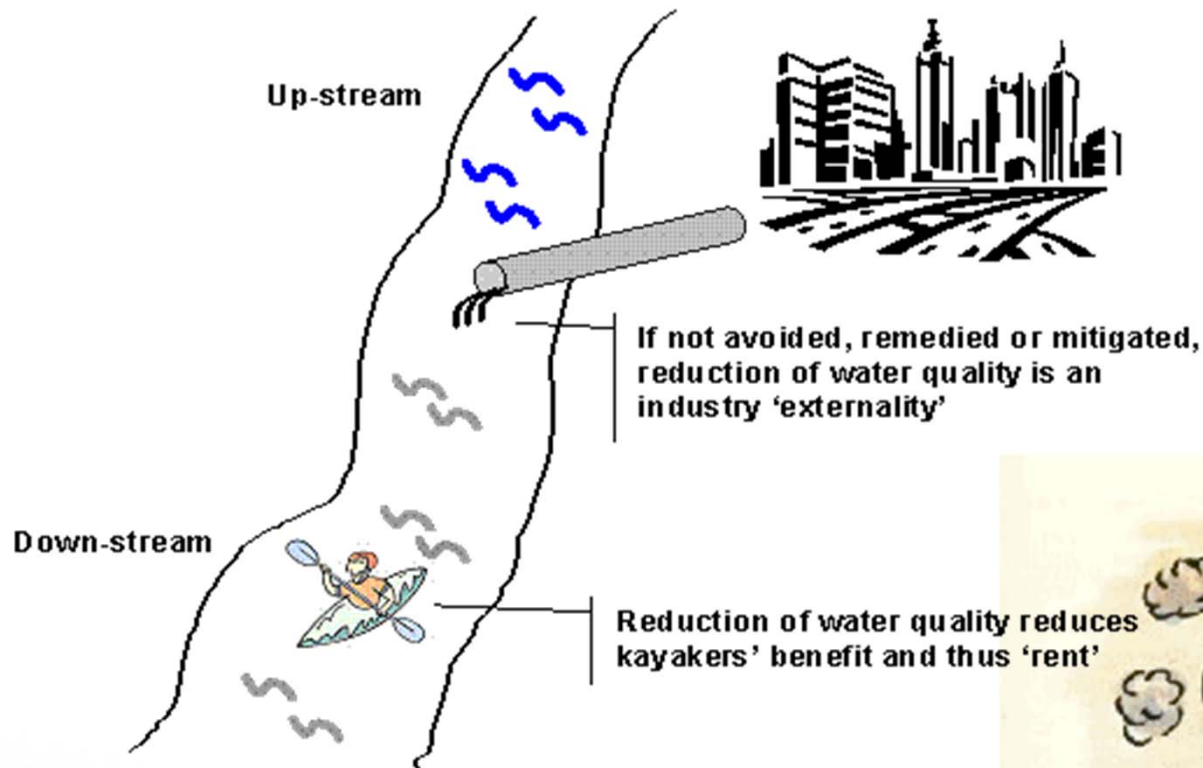


7. Governments can sometimes improve market outcomes

- Market failure may be caused by an **externality**, which is the impact of one person or firm's actions on the well-being of a bystander.
- Market failure may also be caused by **market power**, which is the ability of a single person or firm to unduly influence market prices.



Examples of Externality



香港科技大學
THE HONG KONG
UNIVERSITY OF SCIENCE
AND TECHNOLOGY

Examples of Externality



Singing and dancing in the street, Mong Kok



香港科技大學
THE HONG KONG
UNIVERSITY OF SCIENCE
AND TECHNOLOGY



- Square dancers:

- Group dancing in open squares or other public spaces is a favorite pastime for middle-aged and retired women across China, who usually enjoy it in the evening, or sometimes late into the night, as a good way to keep fit and socialize.
- Amplified music at night has become an annoyance for some nearby residents



One Solution

Bluetooth headphones



Examples of market power

- Monopoly: a single seller on a market.
 - Example?
- Oligopoly: only a few sellers on a market.
 - Examples?



Mankiw's Ten Principles of Economics

C. How the Economy as a Whole Works?

- 8. The standard of living depends on a country's production.
- 9. Prices rise when the government prints too much money.
- 10. Society faces a short-run tradeoff between inflation and unemployment.



Mankiw's Ten Principles of Economics

1. People face tradeoffs.
 2. The cost of something is what you give up to get it.
 3. Rational people think at the margin.
 4. People respond to incentives.
 5. Trade can make everyone better off.
 6. Markets are usually a good way to organize economic activity.
 7. Governments can sometimes improve market outcomes.
 8. The standard of living depends on a country's production.
 9. Prices rise when the government prints too much money.
 10. Society faces a short-run tradeoff between inflation and unemployment.
- Micro
- Macro



How to use economics as a way to understand the world?



香港科技大學
THE HONG KONG
UNIVERSITY OF SCIENCE
AND TECHNOLOGY



The Use and Misuse of Economics

- Do not let math scare you.
 - Economists use math not because they are smart, but because they are not smart enough
- Economics is a collection of models with no predetermined conclusions.
 - “Trade CAN make everyone better off”
 - “Market is USUALLY a good way to organize economic activities”
- It is *A* model, not *THE* model.



The Use and Misuse of Economics

- Models need assumptions, and economics make different assumptions for different models.
 - Market structure, asymmetric information, externality, open access
- *Unrealistic assumptions are OK, but unrealistic critical assumptions are not OK.*
 - Assume symmetric information is OK for the apple and banana markets
 - Assume symmetric information is NOT OK for the insurance market
- When you see a policy recommendation, think about what are the *critical assumptions*. (ERP example, and your essay)



The Use and Misuse of Economics

- Economics does not worship markets, but it helps you to understand how modern world works.
- Efficiency is not everything.
 - Equity, social justice, moral codes, altruism
- The world is almost always *second best* (will be discussed later)
 - Distortions are common
 - “First best” policy recommendations are rarely effective.



Environmental Economics

- Environmental economics is the application of the principles of economics to the study of how environmental resources are developed and managed.



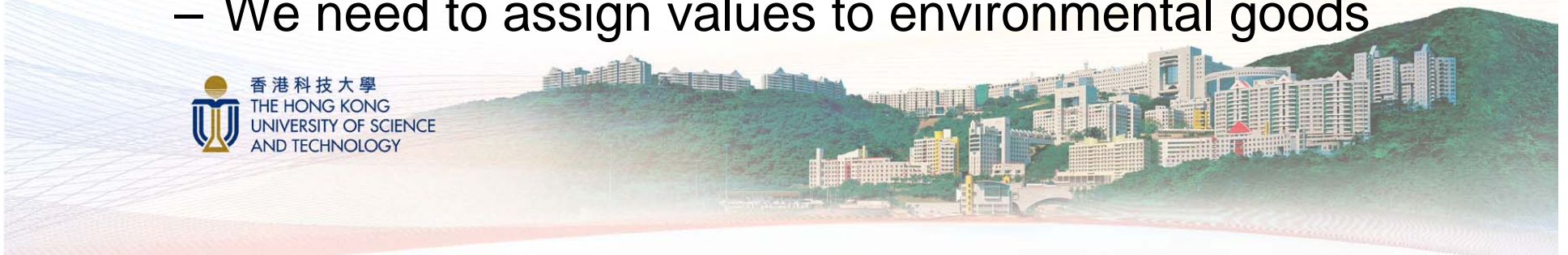
Environmental Economics

- Key tension of environmental economics is between the power of market and the failure of market.
 - Markets are **usually** a good way to organize economic activity.
 - Governments **can sometimes** improve market outcomes.



Key questions for environmental economics

- What is the market failure?
 - Typically, externalities are a problem.
- What type of intervention works best?
 - Problem: there is no market for environmental resources.
- How to evaluate environmental programs?
 - Ideally, we need to know what level of environmental protection is desired.
 - We need to assign values to environmental goods



What is environmental economist? –career prospective

2:30 min video

<https://www.youtube.com/watch?v=Glg7SePEZs>



Thank You!

