



Introduction: Some principles of Economics

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01

What is economics??

What is economics?

- What do you think economics is about?
- To me, economics can be about a wide range of different issues, such as:
 - (1) Analyzing the influences of your cohort on you.
 - (2) Identify the effect of High speed Rail connection on cities' economic growth
 - (3) Exploring what would be the optimal travel restrictions during a epidemics such as COVID-19?

Economics can be about:

- Peer effects, adolescent's behavior, such as
 - Influence of your friends' GPA on your own GPA (Lin,2010; Boucher et al 2014)
 - Influence of your peers' health related behavior (smoking, drinking, fast food consumption) on your own behavior (Fletcher,2010; Fortin and Yazbeck, 2015)
 - Peer effect of delinquent (犯罪) behavior, criminal network and the key player (Lee et al, 2021)

Economics can be about:

- The impact of China's High-Speed-Rail (HSR) project
 - What is the effect of the HSR project on the economic growth of target city nodes in China? (Ke.et al 2017)
 - How does the HSR project shape urban employment and specialization patterns? Which types of industry does it affect most?

Economics can be about:

- The optimal travel restriction that targets specific travel routes across regions, during the COVID-19 pandemic (Chen, Qiu, Shi and Yu 2022)
 - Population flows have shown to be strongly related to disease spread
 - Various public health measures have been proposed and found to be effective in suppressing the virus spread
 - However, some stringent measures (all communities lockdown) may not be cost-effective
 - More cost-effective policy? Travel restrictions on specific origin and destination pairs!

What is economics??

- Economics is about **choices**!! about individuals', firms' even the whole nation or society's choices
- More formally, it studies the choices that individuals, businesses, governments, and entire societies make, and their interactions.
- But why do we need to make choice???
- Because we face **scarcity** (“稀缺性”)
- Scarcity: resources are limited (Main Assumption)

Overview

How People Make Decisions

- 1: People Face Trade-offs
- 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

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

How the Economy as a Whole Works

- 8: A Country's Standard of Living Depends on Its Ability to Produce Goods and Services
- 9: Prices Rise When the Government Prints Too Much Money
- 10: Society Faces a Short-Run Trade-off between Inflation and Unemployment



02 | Trade-off and OC

Principle 1: Trade-off

- To get something that we like, we usually have to give up something else that we also like
 - “there is no free lunch!!”
 - A direct consequence of scarcity
- Examples:
 - Student – time
 - Parent-family income
 - Society: National defense vs Consumer good
 - Prevent the transmission of COVID-19 vs reopening the economy

Principle 2: Opportunity Cost (OC)

- Because people face trade-offs, making decisions requires comparing the **costs** and **benefits** of alternatives of action.
- But what is the ``cost'' in economic sense???
- The opportunity cost (OC) of an item is what you give up to get that item
- Implication: when you choose one item, you must be awarded what you have given up; the value of what you gave up is a crucial part of your cost!!

Decision rule based upon OC

- Cost-benefit analysis
- OC contains all direct cost and some ``indirect cost''(potential value) you give up
- Let A be your choice (i.e., choosing Data science as your major, choosing someone as your boy / girl friend...)
- If the OC of doing A outweighs the benefit
- You should not choose A

Application I: going to college

- Why do you choose to go to college after your high school?
- What is the benefit of going to college?
- Benefit: intellectual enrichment; better (jobs) network, **college degree**
- How about the costs of going to college?

The cost of going to college in economics

- Tuitions, payments on textbook, dorm (direct cost)
- The biggest cost: **your time!!**
- When you spend 4 years in college, (i.e, listening to lectures, writing thesis...), you can not spend `` the same'' 4 years working
- Might be, you lost the potential money you can earn if you work for 4 years.
- **In economics, all costs are OC**
- **OC=direct cost + the value of your time (can be measured in term of money you make)**

04 | Application II: going for Ph.D

The OC of going for a Ph.D

- You are given two choices after your undergraduate study: **work** or go for a **Ph.D** in economics or statistics
- Suppose your Ph.D degree takes 4 years to complete and the total tuition is 50,000 RMB.
- Having a Ph.D degree will increase your life-time earnings by 200,000 RMB, and the enjoyment of doing research in your Ph.D study could bring you another benefit of 10,000 RMB.
- Doing a Ph.D, however, is extremely tough and painful, and you expect the miserable 4 year experience of studying would bring you a cost of 30,000 RMB due to possible depressions or mental stress.

The OC of going for Ph.D

- Suppose, on the other hand, that if you do not go for a PhD, you can work at a firm that pays you 60,000 RMB per year with a probability of 50% (because labor market is really tight).
- Suppose there are no other costs and benefits involved.
- What is the OC of going for a Ph.D?
- Should you go for a Ph.D?
- Does your decision depends on the job market?

03 | Marginal Analysis

Marginal Analysis

- An elaboration of the cost-benefit analysis
- Principle 3: **Rational** people think at the **margin**
- **Rational people (Strong Assumption)**
- Systematically & purposefully do the best they can to achieve their objectives
- **Marginal changes**
- Small incremental adjustments to a plan of action
- Just like derivatives!

Marginal Analysis: Decision Rule

- **Marginal benefits (MB)**
 - Additional benefits
- **Marginal costs (MC)**
 - Additional costs
- **Rational decision maker**
 - Take action only if:
 - Marginal benefits > Marginal costs
 - Optimum is achieved when $MB = MC$
- An example of profit maximization

Marginal Analysis: examples

- An airline wants to decide how much to charge passengers who fly standby
- There are already 90 passengers on the plane, and the average price is \$1000.
- The plane is about to take off with 10 empty seats if it do not take standby passengers.
- Should the airline sell the ticket at \$300?

04 | Incentives

People respond to incentives

- Principle 4: People respond to incentives (a very general principle)
- **Incentive**: something (a reward or a punishment) that **induces a person to act**
 - Attendance, price, public policy, etc.
- Higher price
 - Buyers - consume less
 - Sellers - produce more
- Public policy
 - Change costs or benefits
 - Change people's behavior

People responds to incentives

- Many public policies alter the costs and benefits that people face...
- A tax on gasoline, encourages people to drive smaller, more fuel-efficient cars (even electric cars), or taking more public transportation
- Seat belt laws: seat belts give driver incentives to drive faster because they lower the likelihood of driver death in accidents.
- More accidents, increase in pedestrian death



谢谢!

THANK YOU!

