Introduction:
Think like an economist

Liyang Hong(洪礼阳）
SOE and WISE, Xiamen University
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厦門大學
XIAMEN UNIVERSITY

Content 目录

1. The Scientific Method for Economist

   Example of Natural experiment

2. Two examples of economic model

3. Examples of Micro,Macro and econometrics

4. Positive vs Normative Analysis

01 The scientific method for economist

The economist as a scientist

- Economics is a **social science.**
- Economist acts like scientist in terms of relating observations to general theory
- Observation, then theory, then utilize empirical economic data to test the valdity of the theory by checking its predictions.
- Unlike natural science, conducting experiments in economics is **difficult or impossible**
- Economists pay close attention to **natural experiments**

The economist as a scientist: a naive example

- An economist experiences increasing price (Inflation)
- He proposed a theory: inflation arises when government print too much money
- To test this theory(hypothesis), he could collect data on price and money across different countries
- If price and money are strongly correlated, he should be more confident in the theory.

Example of Natural experiment

- Observation: other things equal, individuals with a higher education level tend to earn higher wage
- Hypothesis: **the return to education** is positive, so higher education will lead to higher wage.
- To test the theory, we could collect some individual level data from the census, which includes data on individuals' highest degree earned, wage level, and other characteristics (beauty, height, gender, race,...)
- Suppose we observe a positive correlation between wage level and education level
- Can we conclude that the return to education is positive???

Example of Natural Experiment

- No, it is possible that people who are smart (or with higher ability) may choose to stay in school longer
- So one possibility is that they can earn a higher wage simply because of they are smart or talented, NOT because of they obtain a higher degree
- This is called **selection bias**
- **Can you make another story?**
- To justify the positive return to education, we need to control for **the confounding effect** of unobserved individual ability, and to eliminate this selection bias

Example of Natural Experiment

- Solution? Compulsory schooling laws, and difference in date of birth of individuals (Angrist and Krueger,1991)
  - Born in Dec. and born in Jan. same age, but different years of schooling because people can quit at the age of 16
- Date of birth is random, not correlated to individual ability
- Date of birth + compulsory schooling laws: a natural experiment in which children are compelled to attend school for different length of time
- Intuition: divide observations into groups based on dates of birth(of course, with variation in education level). Then compare the difference in wage level across groups. **Difference in wage should only be attributed to difference in education.**

Another example

- How to examine the effect of institution on growth?
- Institution can provide good incentives, hence boosts economic growth.
- But, growth requires better institution (property right, law and order, etc.).
- Acemoglu, Johnson and Robinson (2001) use disease and European mortality rate in the colony as natural experiment.
  - Disease is natural
  - Disease – European mortality rate – early institution – recent institution – growth

02 Two economic model

Overview of economic model

- Consists of diagrams, graphs or equations
- Omits many details (making simplifying assumptions)
- Simplify reality to improve our understanding of it
- Focus our thinking on the essence of the problem

The circular flow diagram under a closed economy

It is a visual model of the economy

- Shows how RMB or dollars flow through markets among households and firms
- Two types of decision makers: firms & households
- Two types of markets:
  - For goods and services (Ipad, laptop,cars)
  - For factors of production (labor market)

More on Factor of production

- Firm use labor, land, and capital to produce goods and service
- labor (workers and their knowledge and skill)
- land (not only land, but other natural resource)
- capital (only refers to buildings, machines, not financial capital)

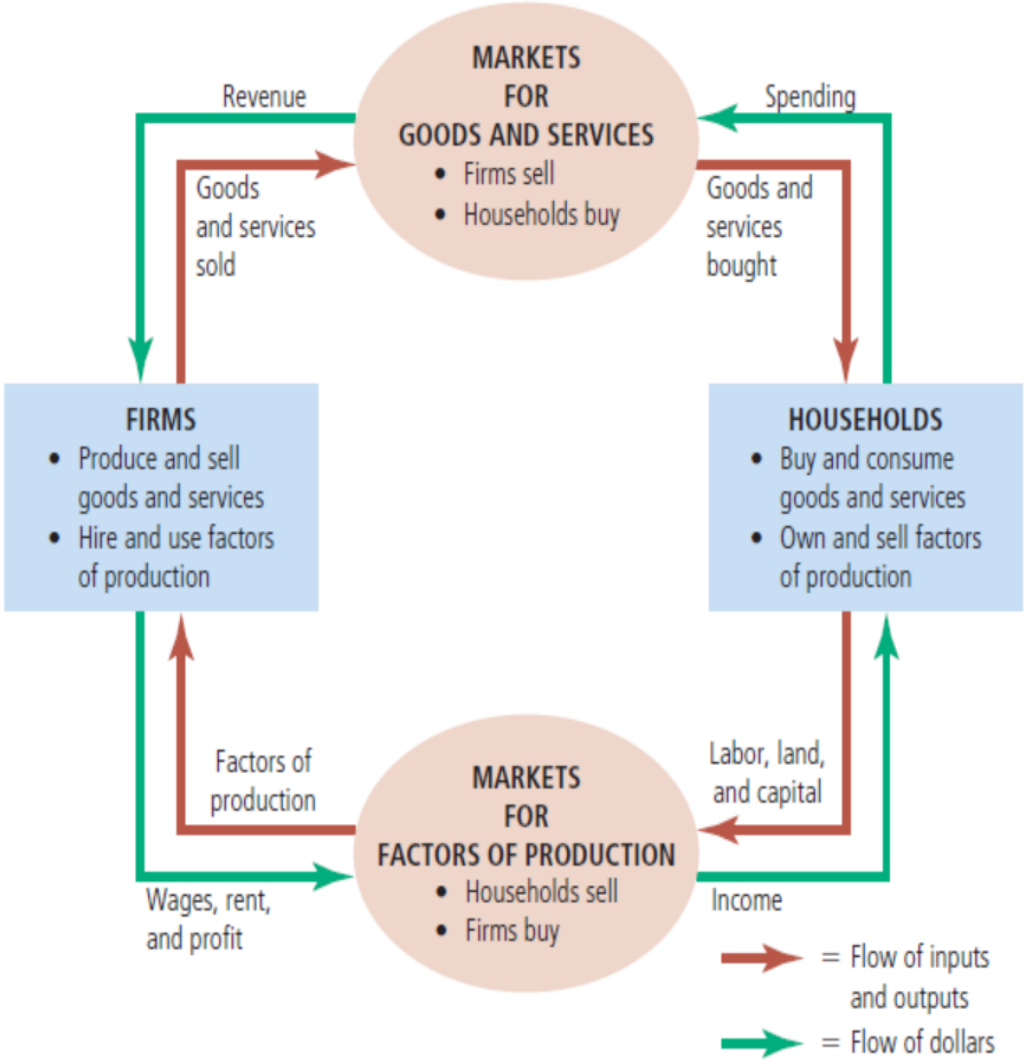
The circular flow diagram under a closed economy

- **Firms**
- Produce goods and services
- Use factors of production / inputs
- **Households**
- Own factors of production
- Consume goods and services
- No international trade, No government

The circular flow diagram under a closed economy

- Markets for goods and services
- Firms – sellers
- Households – buyers
- Markets for inputs (labor market)
- Firms – buyers
- Households - sellers

The circular flow diagram

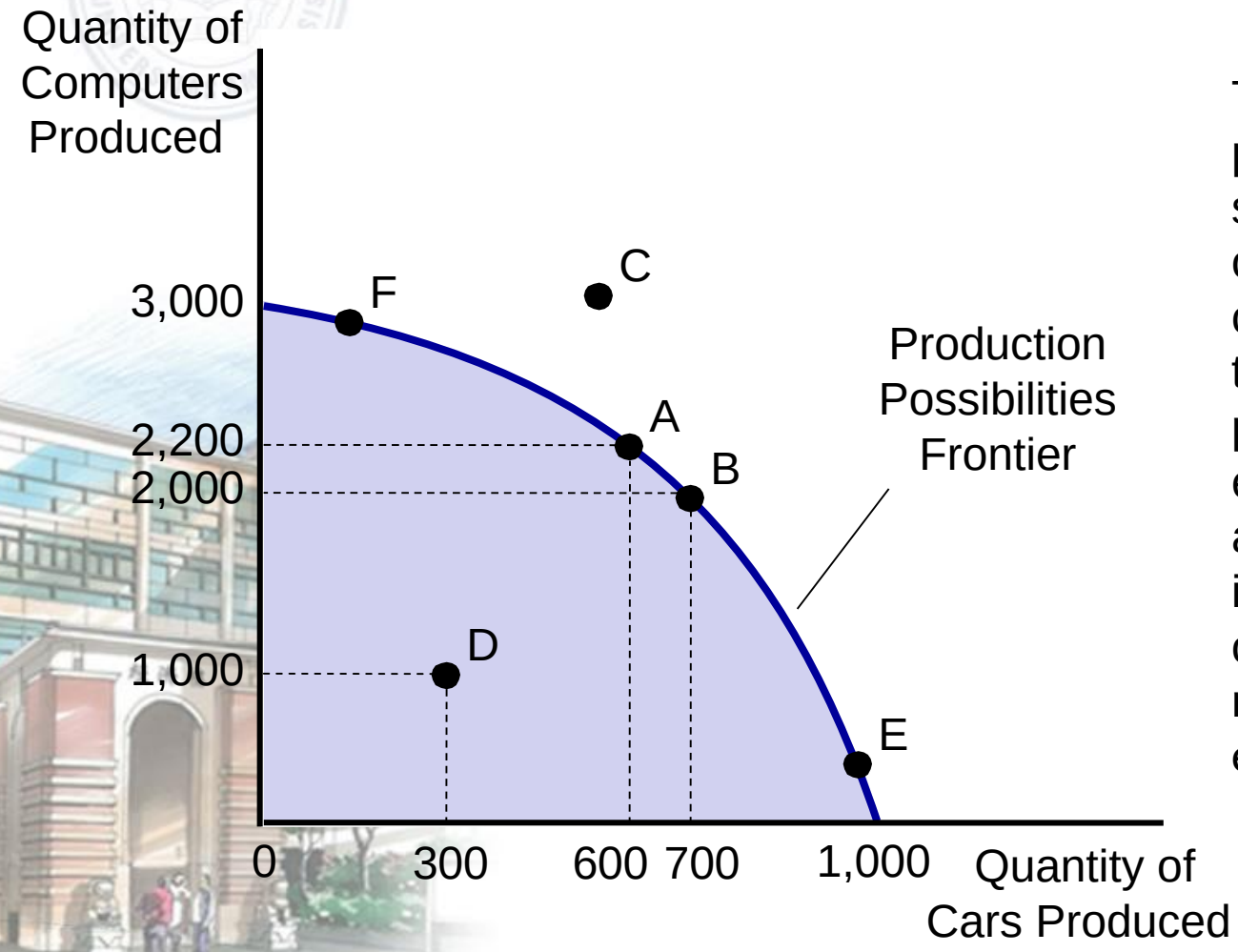


- This diagram is a schematic representation of the organization of the economy. Decisions are made by households and firms. Households and firms interact in the markets for goods and services (where households are buyers and firms are sellers) and in the markets for the factors of production (where firms are buyers and households are sellers). The outer set of arrows shows the flow of dollars, and the inner set of arrows shows the corresponding flow of inputs and outputs.

The production possiblities frontier

- A graph
- Combinations of output that the economy can possibly produce given the available resource and production technology.

The production possibilities frontier



The production possibilities frontier shows the combinations of output—in this case, cars and computers—that the economy can possibly produce. The economy can produce any combination on or inside the frontier. Points outside the frontier are not feasible given the economy's resources.

The production possibilities frontier

- **Efficient levels of production**
- The economy is getting all it can from the scarce resources available
- **Points on the production possibilities frontier**
- Trade-off:
- The only way to produce more of one good
- Is to produce less of the other good

The production possibilities frontier

- **Inefficient levels of production**
- Points inside production possibilities frontier
- **Opportunity cost of producing one good**
- Give up producing the other good
- Slope of the production possibilities frontier

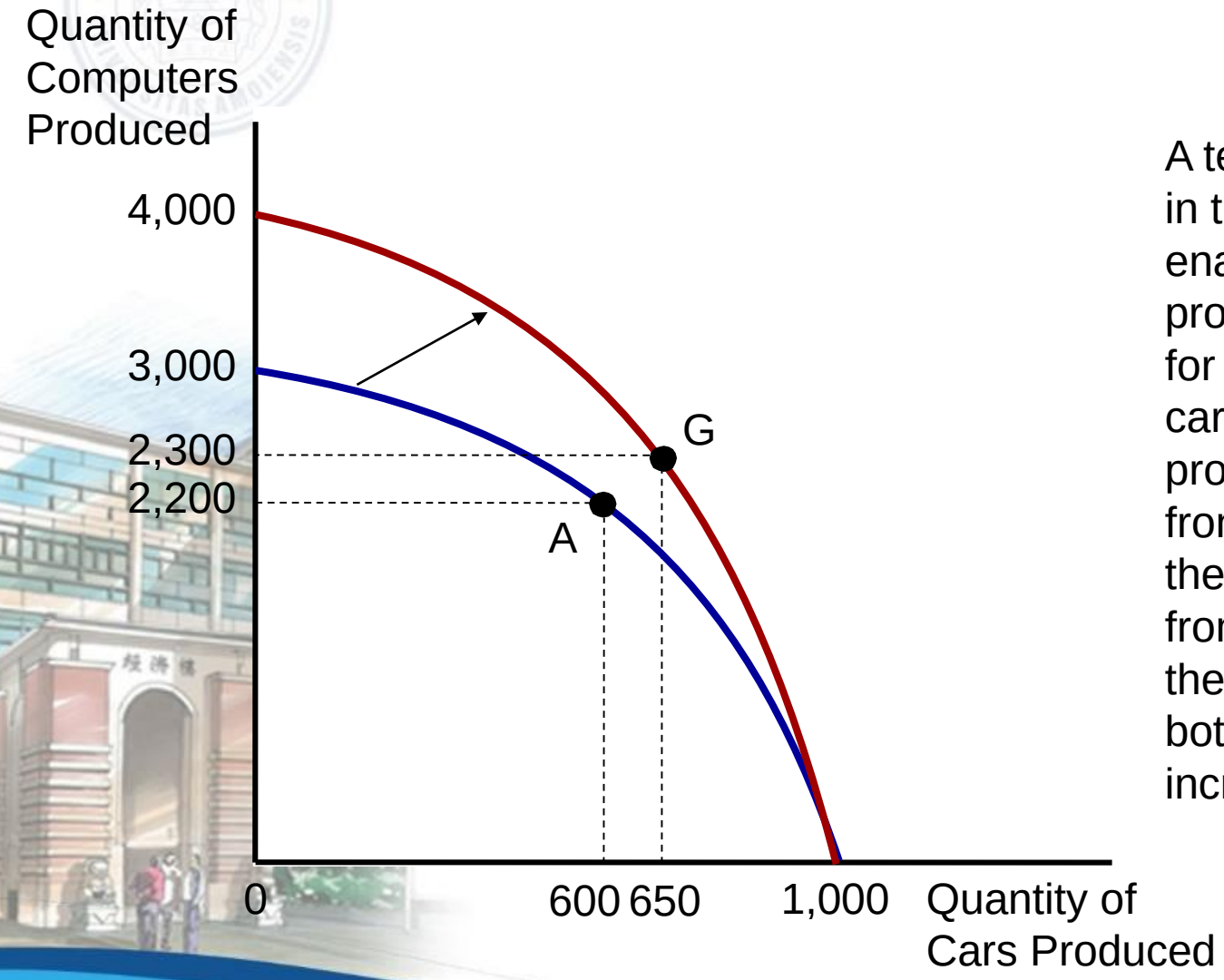
The production possibilities frontier

- Bowed out production possibilities frontier
  - Opportunity cost of a car – higher
    - Economy - producing many cars and fewer computers (E, use most of its resource to produce cars)
  - Opportunity cost of a car – lower
    - Economy - producing fewer cars and many computers (point F, use most of its resource to produce computers)
  - Resource specialization

The production possibilities frontier

- **Technological advance**
- Outward shift of the production possibilities frontier
- The result of technological advance is economic growth
- Produce more of both goods

A shift in the production possibilities frontier



A technological advance in the computer industry enables the economy to produce more computers for any given number of cars. As a result, the production possibilities frontier shifts outward. If the economy moves from point A to point G, then the production of both cars and computers increases.

03 Examples of Micro, Macro, and econometrics

Different fields of economics

- **Microeconomics**
- The study of how households and firms make decisions (choices)
- And how they interact in markets
- **Macroeconomics**
- - The study of economy-wide phenomena, including inflation, unemployment, and economic growth
- **Econometrics**
- Statistical method in economics

Examples: applied microeconomics

- Microeconomics: empirically, can be summarized by

The effect of B on A

The effect of High speed rail (HSR) on cities' economics outcome

T*he Effect of Teacher Gender on Students' Academic and Noncognitive Outcomes*

Examples: Macro and econometrics

- Macro: the effect of a federal income tax cut on the overall production of good and services; or the reason of China's fast economic growth over the past three decades
- Econometrics: peer effect: (the influence of your friend's behavior on your behavior), bahavior can be referred to your GPA, smoking, drinking behavior...

04 Positive Vs Normative Analysis

Positive VS Normative

- **Positive statements (What is)**
- Attempt to describe the world as it is
- Descriptive
- Confirm or refute by examining evidence
- **Normative statements(What ought to be)**
- Attempt to prescribe how the world should be
- Prescriptive

Examples:

- **Positive analysis**
- Minimum wage laws cause unemployment (a claim which can be supported or refuted by data)

- **Normative analysis**
- The government should raise the minimum wage. (a policy adviser's statement)

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谢谢！
THANK YOU!