An Introduction

ECON201 – Winter Session, '24

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UMD

2 January 2024

What is...

1. ...This Course?
2. ...Required?
3. ...An Economist?
4. ...Economics?
5. ...A Market?

Macroeconomics

Academic economics is divides into two major branches:

- **Macroeconomics:**
  - Studies economy-wide phenomena, such as inflation, unemployment, and economic growth.
  - Poses large-scales question which affect the whole economy.
  - High level of abstraction due to complex nature of national economies.
  - Applications: Economic policy, forecasts, institutional design,...
- **Microeconomics:**
  - Studies how households and firms make decisions in specific markets.
  - Incentives of each household and firm are treated rigorously.
  - Ideally, gain transferable insights from individual markets, e.g. used cars or cereals.
  - Applications: Design of auctions, market mechanisms, tax schemes, industrial policy,...

The branches' principles are closely related but they are distinct fields of study.

Goals

- This course is an introduction to macroeconomics. As such, it has two goals:

  1. Teach you the basic vocabulary of macroeconomics, to enable you to scrutinize economic news and policy. For example,
     i. What does "Inflation is 3% above the Fed's target" mean?
     ii. What are the benefits and costs of increased government spending?

  2. Give you a flavor of the academic subject of macroeconomics, if you consider becoming economists. In particular, teach you how to use a simple model to make sense of complex questions.

- These goals are closely related. After all, economic arguments are often made by economists!
- However, occasionally, the complexity of real-world policies will clash with the simplicity of academic models. Be careful!

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Syllabus

- Asynchronous course $\longrightarrow$ attendance **not** mandatory
- Text: Mankiw's *Principles of Macroeconomics* via **Mindtap** (sign up ASAP)
- Weekly discussions
- Seven problem sets
- Three exams
- See syllabus on ELMS for details!

Contact and Office Hours

It is **crucial** for you to stay in touch with the course throughout:

- Check your ELMS announcements daily!
- Do not delay your discussion contribution!
- Email me or come to office hours **immediately** if you do not understand something!

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Two Roles

- Economists play two distinct roles in our society:
  1. (Social) scientists who formulate and test positive propositions, and
  2. Policy advisers who make (or help others to make) normative statements.

- **Positive statements** are descriptive. They are either true or false, independently of the observer. For instance,
  - "High interest rates cause inflation." (false)
  - "The federal minimum wage is $7.25." (true)

- **Normative statements** are prescriptive. They express the author's view of how the world *ought to be*. As such, they cannot be true or false independently of the author's value judgements. For example,
  - "It would be better if inflation were lower."
  - "The federal minimum wage should be $15.00."

The Scientist

- Like scientists, economists formulate hypotheses, collect data, and devise tests to verify or refute these hypotheses.

- The process of iterative refinement of hypotheses by means of empirical tests is called the *scientific method*.

- To count as scientific, new economic hypotheses need to make novel, yet *falsifiable* predictions (Popper, 2005).

- **Problem:** Lab experiments are not feasible in (macro-)economics. Sometimes, history offers "natural experiments". More often, models are needed.

Models I

- Models are a crucial ingredient of every scientific investigation, including in economics.

- They consist of at least two types of assumptions:
  i. Simplifying assumptions help focus our attention on the important interactions and make our question tractable.
  ii. Hypothetical assumptions lead us to additional predictions which we may test once relevant data are available.

- Using these assumptions, model imply predictions which the scientist may then test empirically. Scientific progress is achieved by iteration on “falsified” models.

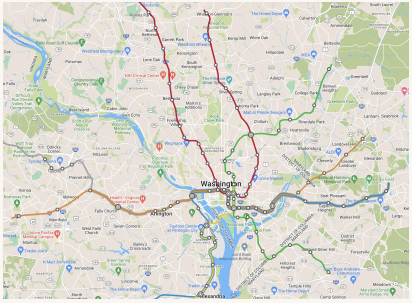
Models II

- Which assumptions are simplifying and which hypothetical depends on the question at hand.

- **Examples:**
  a. Air friction: How fast does a marble/feather fall to the ground?

  b. Maps: Imagine you were an alien anthropologist, unfamiliar with the DMV. Which of following models would you use if you wanted to explain
     i. how holes in the ground with big 'M's are connected,
     ii. where humans are likely to emerge from such holes, or
     iii. how humans travel between red-flagged glass half-sheds?

Maps as Models

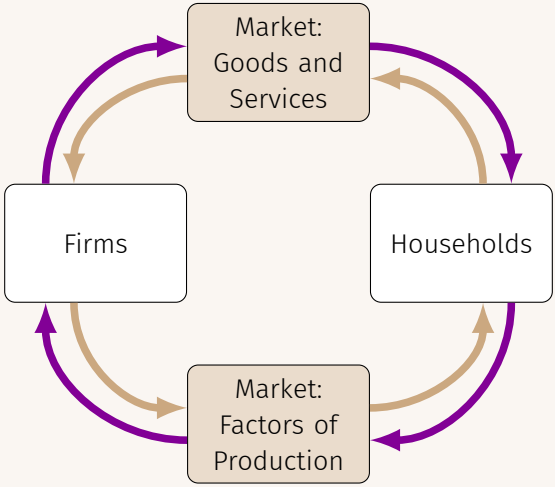


The Circular-Flow Model

Simple, but helpful for basic relationship between consumption and production!

First simple model economy:

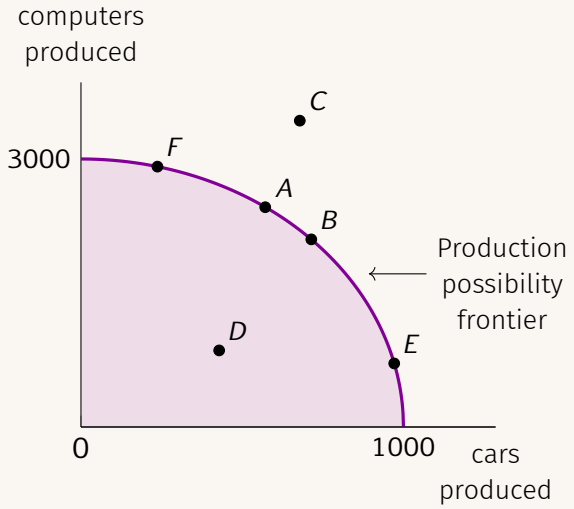
- **Two decision makers:**
  i. Households (sell labour, buy goods)
  ii. Firms (employ workers, sell goods)
- **Two markets:**
  i. Goods/services (consumed)
  ii. Factors of production (inputs)
- **Two circular flows:**
  i. Goods (clockwise)
  ii. Money (anti-clockwise)



Production Possibility Frontier

Second simple model economy:

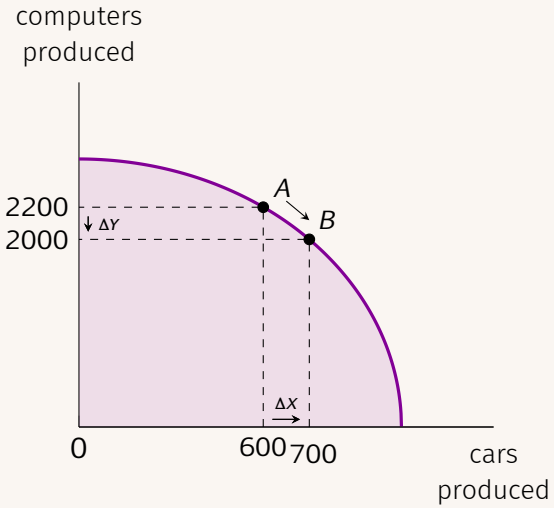
- **Two industries:**
  i. Car manufacturer
  ii. Computer producers
- Production possibility frontier (**PPF**) is the set of combinations which economy can **at most** produce, given:
  i. resources, and
  ii. technology.
- **Efficiency:**
  i. On frontier = **efficient** (A, B, E, F).
  ii. Below frontier = **inefficient** (D).
  iii. Above frontier = **infeasible** (C).



Opportunity Cost

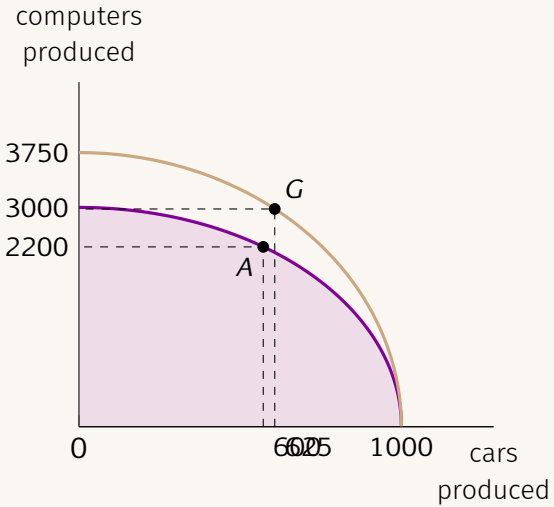
Opportunity cost of one good in terms of the other is given by **slope** of PPF:

- Consider moving from A to B.
- Gain 100 cars, but lose 200 computers.
- Thus, at point A, the opportunity cost of 100 cars is 200 computers.
- Alternatively, at point A, the opportunity cost of a car is two computers.
- More generally, the opportunity cost of X in terms of Y is $\Delta Y / \Delta X$.



Economic Growth

- Tradeoff may change the same over time:
  i. Change in resources (e.g. war).
  ii. Technological advances (e.g. Moore's Law).
- Technological progress is central to sustained economic growth.
- Here, as tech. progress improves computer production, the quantity of **both** goods increases.
- **Lesson:**
  Innovation in one sector may expand production in other sectors because **tradeoff** changes.



The Policy Adviser

- Economists are often asked to give guidance on what policy alternative is best. In some cases, they even choose policy directly (e.g. the Federal Reserve).

- Economic policy advice typically abstracts from political considerations, focuses on efficiency and a particular measure of welfare.

- Policy disagreements between economists arise due to either (i) different **positive** theories (incl. measurement) or (ii) different measures of welfare (**normative**).

- For example, consumer welfare standard vs. total welfare standard in anti-trust policy.

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A Brief History of Economics

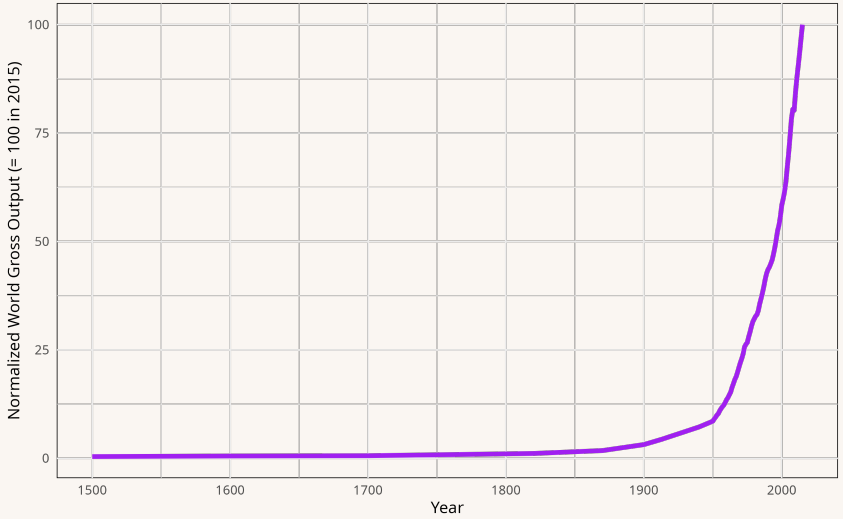
- But what exactly is this thing that economists study?
- Historically, economics has been closely related to government finances. Rulers wanted to grow their economies to collect more taxes and build stronger armies.
- Most famous early book on economics: Adam Smith's "Wealth of Nations".
- This is reflected in early definitions of economics, for example:

Early Definitions

"...political economy, which unfolds the manner in which wealth is produced, distributed and consumed." Jean-Baptiste Say (1803)

"The science which traces the laws of such of the phenomena of society as arise from combined operations of mankind for the production of wealth, in so far as those phenomena are not modified by the pursuit of any other object." John Stuart Mill (1836)

World Output



Source: World Bank (2017) [Maddison Project]

Marginalist Definition

- In the 20th century, economics' focus moved to individuals, their choices and needs. This gave rise to the still most common definition, found in our textbook. It originates with Lionel Robbins:

  "Economics is the science which studies human behaviour as a relationship between ends and scarce means which have alternative uses."

  Lionel Robbins (1932)

- Or, in a more contemporary idiom:

  "Economics is the study of how people allocate their limited resources to satisfy their unlimited wants." Miller (2011)

The Economic Approach

- The marginalist definition of economics suggests that economics is more than just a particular subject matter.

- Economics is a particular approach to the study of human choice behaviour in any context,
  e.g. marriage, criminality, racial discrimination, political economy, ...

  "The combined assumptions of maximizing behaviour, market equilibrium, and stable preferences, used relentlessly and unflinchingly, form the heart of the economic approach as I see it." Becker (1976)

- Let us now preview some of the principles and fundamental results which underpin this approach:

Trade-offs

1. People face **trade-offs:** We cannot satisfy *all* of our needs *at once* with the limited resources and technology available.
   - Often, economists will assume *"more is better"* (negatively: greed).
   - This could also be about a *"love for diversity"* and limited resources (e.g. time).

2. **Opportunity cost:** The cost of anything is what you have to give up to get it.
   - Sometimes, this will be money, e.g. wage work vs. leisure.
   - Generally, in a trade-off between X and Y, the cost of X is Y.

Decision makers

3. **Rational** people consider **marginal choices**. That is, they weigh *marginal* costs and *marginal* benefits.
   - An action is rational only if its marginal benefit exceeds its marginal cost. Contrast with average benefit/cost?
   - What are the marginal cost and benefits of an additional hour of work?

4. **Incentives matter.**
   - Not every individual may respond to every incentives immediately but, on average and in the medium run, behaviour will adjust in response to incentives.
   - Peltzman (1975)'s seat belt study: Drivers cause more accidents with seatbelt as they are safer?
     Crandall and Graham (1984): Not enough to offset technological improvements, but some effect.

Markets and Trade

5. Trade is **not** a zero-sum game. Everyone **can** benefit from trade in the long run.
   - Gains from trade because specialization and division of labor improve output. Ricardo: *Comparative* advantage, **not** absolute.
   - Note: trade is not always beneficial. In the short-term, competition may cause painful adjustments (e.g. coal in WV).

6. Large, diverse economies are best organised as **market** economies. That is, decisions about production and consumption are best made by individuals and firms, **not a central planner**.
   - *Major reason:* People *know more* about their own skills and desires than any government. In a market economy, *it pays* to serve each other's interest in the most efficient way $\rightarrow$ best use of resources ("invisible hand").
   - *Prices are central*: Simple signal, informing agents about the need/incentives for more or less production (Hayek, 1945).

Government and Long-Run Growth

7. Governments **can** improve market outcomes.
- Physical and legal infrastructure is crucial for market economies to operate efficiently, e.g. *property rights* and law enforcement.
- **Market failure** may need correction, e.g. *externalities* from GHG emissions or *market power*/barriers to competition.
- Redistribution may achieve policy goals other than efficient use of resources, e.g. equality.

8. Living standards are determined by **productivity**. That is, in the long run, institutions, skills and technology are **more important than natural resources** or stock of capital.
- *Example:* Countries with limited natural resources whose capital was destroyed in wars; Japan and Germany after WW2.
- *Caveats:* Market size also matters. + May not be true without trade.

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A Market is...

- ...a group of **buyers**, demanding a particular good or service, and **sellers**, who supply it.

- **Perfectly Competitive Market:**

  - Many buyers and sellers for the same product.

  - All buyers and sellers are small relative to the market. Individually, they cannot influence the market price.

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1. Demand
2. Supply
3. Equilibrium

Quantity Demanded

- The decisions of buyers determine demand for a good or service.

- The **quantity demanded** of a good is the amount which buyers are *able* and *willing* to purchase *at a given price*.

- **Law of Demand:** When the price of a good falls, the quantity demanded of a good increases, all else equal.

The Demand Schedule

- **Demand Schedule:**
  The quantity demanded of a good, given a finite number of prices.
- Demand schedule can be represented as a table.
- **Example:**
  Anne's demand for tea.

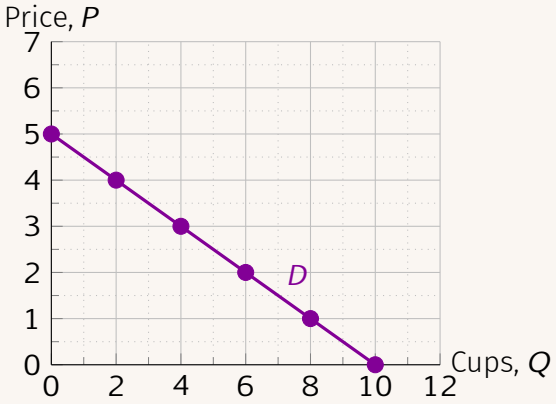
Price of a cuppa	Quantity of tea demanded
$ 0.00	10
$ 1.00	8
$ 2.00	6
$ 3.00	4
$ 4.00	2
$ 5.00	0

The Demand Curve

Demand Schedule:

Price of a cuppa	Quantity of tea demanded
$ 0.00	10
$ 1.00	8
$ 2.00	6
$ 3.00	4
$ 4.00	2
$ 5.00	0

Demand Curve:

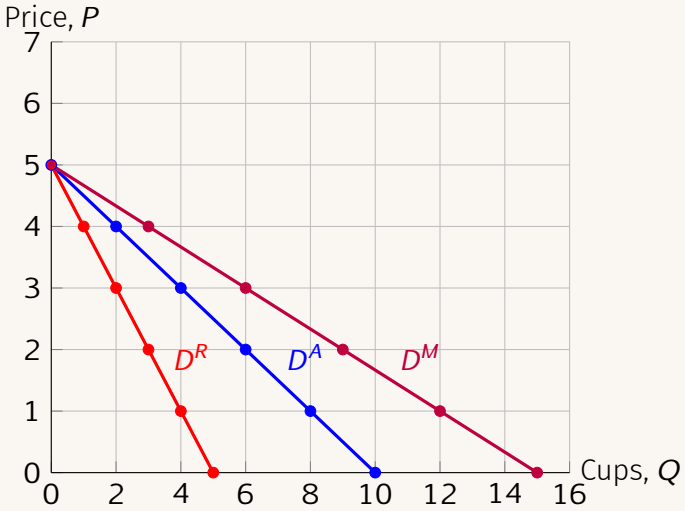


Market Demand

- The market's quantity demanded is the sum of the quantities demanded by all buyers at each price.
- Suppose Anne and Rishi are the only two buyers in the market for cups of tea.
- **Notation:** Q^d = quantity demanded.

Price	Anne's Q^d		Rishi's Q^d		Market Q^d
\$ 0.00	10	+	5	=	15
\$ 1.00	8	+	4	=	12
\$ 2.00	6	+	3	=	9
\$ 3.00	4	+	2	=	6
\$ 4.00	2	+	1	=	3
\$ 5.00	0	+	0	=	0

Market Demand Curve



Demand Curve Shifters: No. of Buyers

- **Question:** What may cause demand to change?
  Or, what shifts the demand curve?

- Obviously, an increase in the number of buyers would increase the quantity demanded at any given price.
- Thus, an increase in the number of buyers shifts the demand curve to the right.

Demand Curve Shifters: Income

- **Normal Good:**
  - Demand for a **normal good** is positively related to income.
  - An increase in income causes increased quantity demanded at each price, shifting the demand curve to the right.
- **Inferior Good:**
  - Demand for an **inferior good** is negatively related to income.
  - An increase in income causes decreased quantity demanded at each price, shifting the demand curve to the left (e.g. public transit).

Demand Curve Shifters: Price of Substitutes

- Two goods are **substitutes** if an increase in the price of one causes a rise in demand for the other.

- **Example 1:** Tea and coffee. An increase in the price of coffee will increase the demand for tea.

  $\rightarrow$ Demand curve for tea shifts to the right.

- **More Examples:** Laptops and desktop computers, coke and pepsi, pizza and burritos, ...

Demand Curve Shifters: Price of Complements

- Two goods are **complements** if an increase in the price of one causes a fall in demand for the other.

- **Example 1:** Tea and milk. An increase in the price of milk will decrease the demand for tea. $\rightarrow$ Demand curve for tea shifts to the left.

- **More Examples:** Software and computers, college tuition and textbooks, bagels and cream cheese, ...

Demand Curve Shifters: Tastes

- Anything that causes a shift in tastes *toward* a good will increase demand for that good, shifting its demand curve to the right.

- **Example:**
  Suppose, e.g. for environmental reasons, people want more insect-based protein in their diet, this will increase the demand for crickets at any price and shift the demand curve for crickets to the right.

Demand Curve Shifters: Expectations

- Consumers' buying decisions are also affected by **expectations**.

- **Examples:**

  - If people *expect* their incomes to rise, their demand for meals at expensive restaurants may increase even before their income increases.

    $\rightarrow$ Demand curve for such meals shifts right.

  - If a recession is *expected* and people are worried about their future job security, demand for new cars may fall already.

    $\rightarrow$ Demand curve for new cars shifts left.

Summary: Mover and Shifters

Variable	A change in this variable...
Price	...moves along the demand curve.
No. of buyers	...shifts the demand curve.
Income	...shifts the demand curve.
Price of other goods	...shifts the demand curve.
Tastes	...shifts the demand curve.
Expectations	...shifts the demand curve.

The Demand Function

– A general equation representing the demand curve:

$$Q_X^d = f(P_X; P_Y, M, H_X)$$

- Q_X^d = quantity demanded of good X.
- P_X = price of good X.
- P_Y = price of good Y (substitute vs. complement).
- M = income (normal vs. inferior good).
- H_X = any other variable affecting demand (e.g. taste).

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1. Demand
2. Supply
3. Equilibrium

Quantity Supplied

- The decisions of sellers determine supply of a good or service.

- The **quantity supplied** of a good is the amount which sellers are *able* and *willing* to sell at a given price.

- **Law of Supply:** When the price of a good rises, the quantity supplied of a good increases, all else equal.

The Supply Schedule

- **Supply Schedule:**
  The quantity supplied of a good given a finite number of prices.
- Supply schedule can be represented as a table.
- **Example:**
  Gongcha's supply of tea.

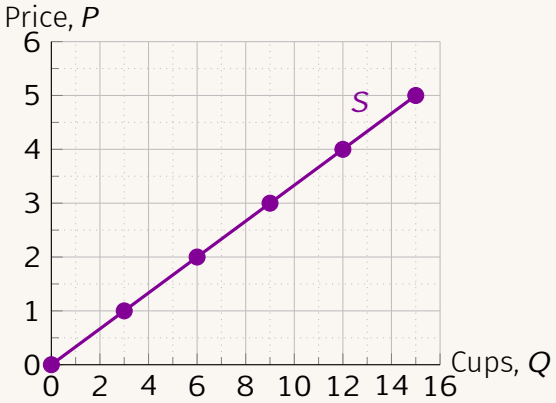
Price of a cuppa	Quantity of tea supplied
$ 0.00	0
$ 1.00	3
$ 2.00	6
$ 3.00	9
$ 4.00	12
$ 5.00	15

The Supply Curve

Supply Schedule:

Price of a cuppa	Quantity of tea supplied
$ 0.00	0
$ 1.00	3
$ 2.00	6
$ 3.00	9
$ 4.00	12
$ 5.00	15

Supply Curve:

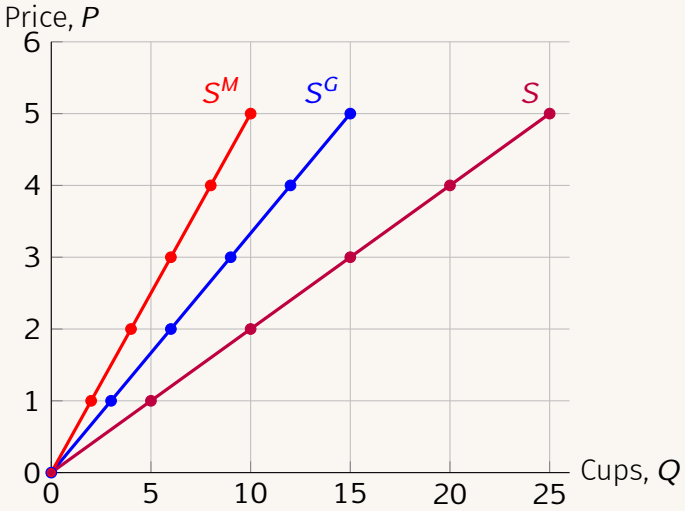


Market Supply

- The market's quantity supplied is the sum of the quantities supplied by all sellers at each price.
- Suppose Gongcha and Möge are the only two sellers in the market for cups of tea.
- **Notation:** Q^s = quantity supplied.

Price	Gongcha's Q^s		Möge's Q^s		Market Q^s
\$ 0.00	0	+	0	=	0
\$ 1.00	3	+	2	=	5
\$ 2.00	6	+	4	=	10
\$ 3.00	9	+	6	=	15
\$ 4.00	12	+	8	=	20
\$ 5.00	15	+	10	=	25

Market Supply Curve



Supply Curve Shifters: No. of Sellers

- **Question:** What may cause supply to change?
  Or, what shifts the supply curve?

- Obviously, an increase in the number of sellers would increase the quantity supplied at any given price.
- Thus, an increase in the number of sellers shifts the supply curve to the right.

Supply Curve Shifters: Input Prices

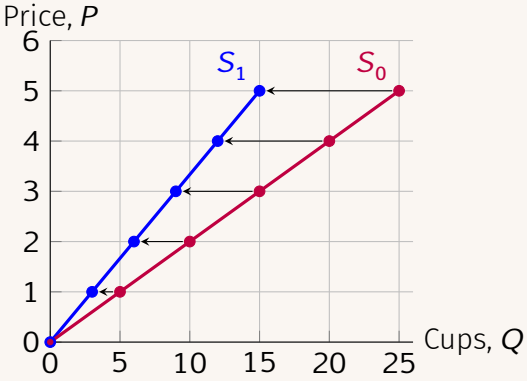
- A fall in **input prices** makes production more profitable at each output price. So, firms supply a larger quantity at each price.
  $\rightarrow$ The supply curve shifts to the right.

- **Examples of input prices:**
  Wages, prices of raw materal (e.g. tea leaves/powder).

- **Question:** What about rent?

Supply Curve: Left Shift

- Suppose workers in tea stores have unionized and negotiated a higher wage. All else equal, this increases the marginal cost of a cup of tea at each shop.
- Thus, sellers are willing to provide fewer cups at any given price.
- The supply curve shifts left.



Supply Curve Shifters: Technology

- **Technology** determines how much input is needed to produce a unit of output.

- A cost-saving technological improvement has the same effect as a fall in input prices.
  $\rightarrow$ The supply curve shifts to the right.

Supply Curve Shifters: Expectations

- Suppose a firm expects the price of a good it sells to rise in the future.

- The firm may reduce supply now, to build up inventory to sell later at the expected higher price.
  $\rightarrow$ The supply curve shifts to the left.

Summary: Mover and Shifters

Variable	A change in this variable...
Price	...moves along the supply curve.
No. of sellers	...shifts the supply curve.
Input prices	...shifts the supply curve.
Technology	...shifts the supply curve.
Expectations	...shifts the supply curve.

The Supply Function

– A general equation representing the supply curve:

$$Q_X^s = f(P_X; W, H_X)$$

- Q_X^s = quantity supplied of good X.
- P_X = price of good X.
- W = price of inputs (e.g. wages).
- H_X = other variables affecting supply.

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1. Demand
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Demand and Supply Together

- With these simple representations of the constituent buyers' and sellers' behavior, we examine how price and quantity are determined in a market.

- **Definition:**

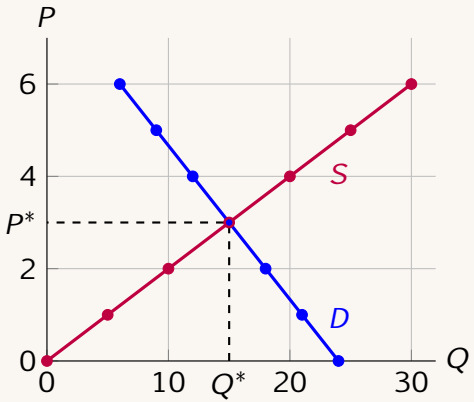
  A price P^* is the *equilibrium price* of good X if and only if, given P^*, the quantity demanded of X, Q_X^d, equals the quantity supplied of X, Q_X^s.

- The quantity supplied and demanded at P^* is also called the *equilibrium quantity*, Q^*.

- In equilibrium, the market "clears" in the sense that there is neither too much nor too little good supplied, relative to the demanded quantity.

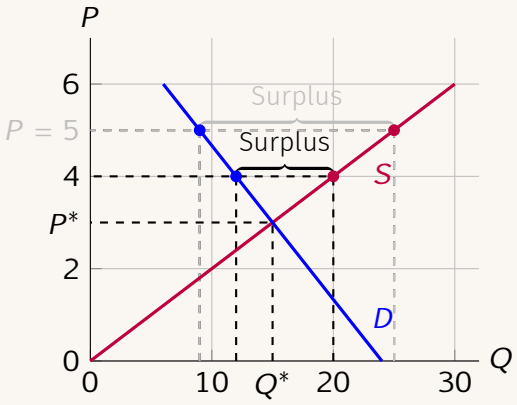
Equilibrium Illustrated

P	Q^D	Q^S
\$ 0.00	24	0
\$ 1.00	21	5
\$ 2.00	18	10
\$ 3.00	15	15
\$ 4.00	12	20
\$ 5.00	9	25
\$ 6.00	6	30



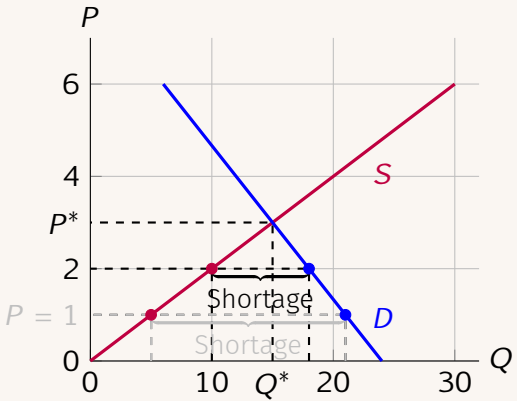
Surplus

- **Surplus:** When quantity supplied exceeds quantity demanded.
- **Example:** At $P = \$5$, $Q^s = 25 > Q^d = 9$.
- Given surplus, some sellers cut prices to increase sales. This increases Q^d and decreases Q^s $\rightarrow$ reduces surplus.
- The sellers' profit incentive drives market toward equilibrium.



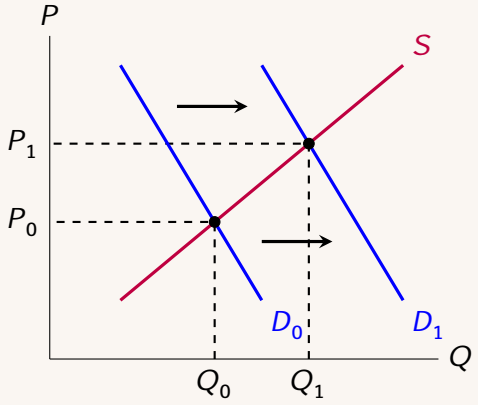
Shortage

- **Shortage:** When quantity demanded exceeds quantity supplied.
- **Example:** At $P = \$1$, $Q^d = 21 > Q^d = 5$.
- Given shortage, buyers will buy even above market price, sellers have incentive to raise prices. This increases Q^s and decreases Q^d $\rightarrow$ reduces shortage.
- The sellers' profit incentive drives market toward equilibrium.



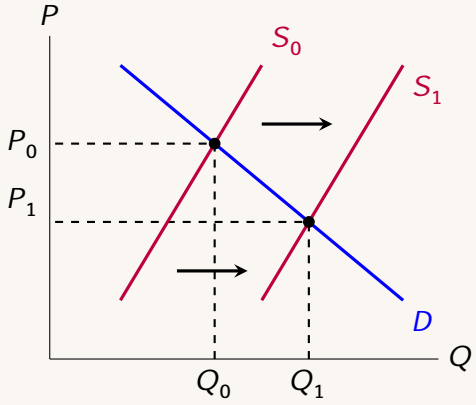
Change in Demand

- Consider the market for electric cars. What happens if the price of gas increases?
- Electric cars are a substitute to gas (cars)
  $\rightarrow D$ shifts right.
- In equilibrium, both price and quantity of electric cars increase.
- **Important:** No change in supply. Only in quantity supplied.



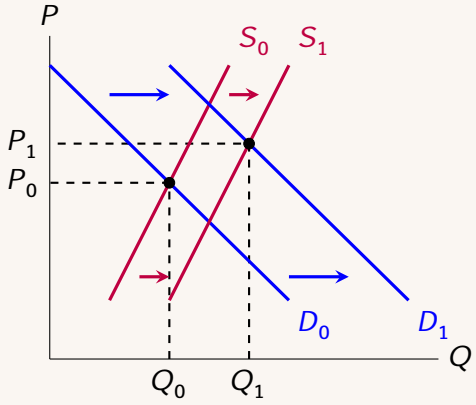
Change in Supply

- Consider the market for electric cars. What happens when a new technology makes batteries cheaper to produce?
- Batteries are inputs into electric cars. $\rightarrow S$ shifts right.
- In equilibrium, quantity of electric cars increase and price decreases.
- **Important:** No change in demand. Only in quantity demanded.



Change in Both

- Consider the market for electric cars. What if both the price of gas **and** battery technology change **simultaneously**?
- Both curves shift to the right.
- In equilibrium, the quantity of electric cars increase **but** the effect on price is ambiguous.
- If demand increases more than supply, price increases.



Conclusion

- Economists play two roles: scientists and policy advisers.
- As a science, economics uses models, e.g. circular flow model and production possibility frontier.
- Economics is an approach to the study of human choice. Focus on incentives, productivity, and tradeoffs.
- We build a simple model of a market, relating prices and quantities to each other through buyers' demand and sellers' supply.
- **Next:** Put numbers to the demand-and-supply diagram, national output, and the aggregate price level.

References I

Becker, Gary S (1976). *The economic approach to human behavior*. Vol. 803. University of Chicago press.

Crandall, Robert W and Graham, John D (1984). 'Automobile safety regulation and offsetting behavior: Some new empirical estimates'. *The American Economic Review* 74.2, pp. 328–331.

Hayek, Friedrich August (1945). 'The use of knowledge in society'. *The American economic review* 35.4, pp. 519–530.

Miller, RL (2011). 'Economics today. Updated edition'.

Peltzman, Sam (1975). 'The effects of automobile safety regulation'. *Journal of political Economy* 83.4, pp. 677–725.

Popper, Karl (2005). *The logic of scientific discovery*. Routledge.