Lecture 5: Consumer Surplus, Production and Supply

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Clicker Question

Emily's demand curve for milk is downward sloping, because…

Willingness to Pay (WTP)

- Willingness to Pay is the maximum that a consumer is willing to pay for a good or service.
- **Example:** WTP for Trump
  - You are walking along in Kenmore Square after studying economics all night.
  - In the window of the BU Bookstore you see a Donald Trump mask.
  - The mask is really scary.
  - You think, "I really want that mask. I absolutely must have it."

- You think, "I'd be ***willing to pay*** up to $60 for that mask."
- Then you notice a price tag on the mask. The price: $12.
- You rush in and buy the mask.

- ***Willingness to pay (WTP)*** is the ***maximum*** you would pay.
  - If WTP = $60, you would ***not*** be willing to pay $61.
  - Of course, you are willing to pay $60,…
  - and you would be happy to pay anything less than $60.
  - In particular, you would be delighted to pay only $12.

- Describing this situation, economists would say:
  - Your ***willingness to pay*** = $60.
  - The ***price*** = $12.
  - Your ***consumer surplus*** = $48.
- ***Consumer surplus*** is the monetary value of the benefit remaining to the consumer after the price is paid. ***(CS = WTP – P)***
- Consumer surplus of a voluntary purchase will not be negative,…
- …because the consumer ***would not buy*** a good that would give him a negative surplus (unless he is behaving irrationally).

Clicker Question

If the willingness to pay is $120 and the price is $140, then how much …

The Production Process

- The entire production process is a series of transformations in which the ***primary factors of production*** (or primary inputs)…
- …gradually become the ***final goods*** and ***services*** used for consumption or as tools for production.
  - goods are physical: apples, sewing machines,…
  - services are intangible: haircuts, university lectures,…
  - Goods can be resold; services cannot be.
- Inputs at stages of production between primary factors and final goods are called ***intermediate inputs***.
- Which inputs are the primary factors of production?

Primary Factors of Production

- The ***primary factors of production*** are services that households provide as inputs into the productive process.
  - Labor services: Productive work from human beings

Note: We often omit the word "services" from the names of primary factors.

- Capital Services: from productivity-increasing capital goods (tools)---in the form of physical capital, human capital and social capital.

- Land Services: provided by nature, sometimes called "natural resources"

(We think of labor, capital goods and land as being owned and controlled by households.)

Availability of Primary Factors

- Determined both by economic and by noneconomic forces.
- The availability of labor depends on the working-age population and the labor-force participation rate.
  - Both are influenced by wage levels.
  - These are difficult issues, studied by demographers (experts in population) and labor economists.
- The availability of ***land*** is determined by nature.
  - Exception: Boston's Back Bay
- The availability of capital goods is the result of ***capital formation*** (the creation of tools).

Economic Growth

- Many societies have become accustomed to annual growth in economic output (GDP).
- In societies with low population growth, increases in economic output often imply increases in output per person.
  - Between 1980 and 2015, real income per capita in **China** increased by a factor of more than 25, an annual growth rate of almost ***10%***.
  - 750 million Chinese were lifted out of poverty.
  - During the same period, real income per capita in the **United States** grew at an annual rate of less than ***2%***,…
  - …and much of the increase in the US went to people who were relatively wealthy.

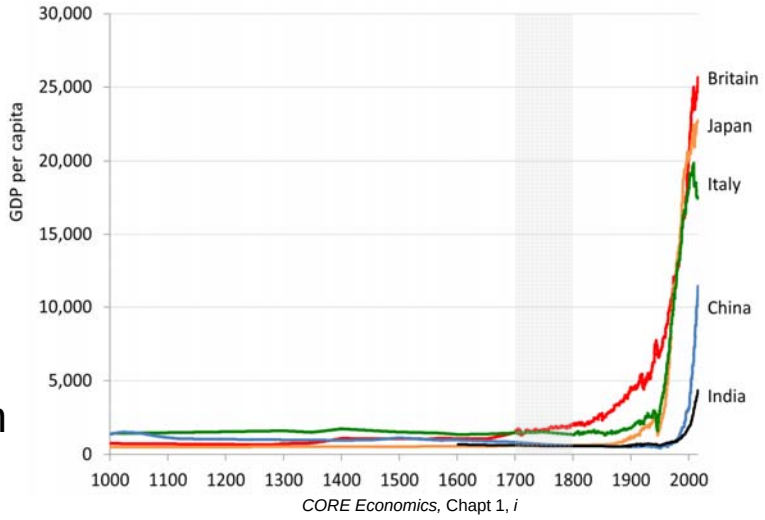
Sources of Economic Growth

- Economies grow because of
  - growth in the quantity of primary inputs, and
  - the use of new, more productive technologies.

- Growth in the amount of primary inputs
  - Labor input doesn't grow much in advanced economies (or it may even shrink).
  - Neither does the amount of land, almost all created by nature.
  - But because of capital formation, the quantities of physical and human capital increase over time.

Capital Formation and Technological Change

- Experts estimate that in the last 70 years, 50% - 70% of economic growth comes from capital formation,…
- and the rest comes from new technologies (technological change).
- But new technology was the key to the the Industrial Revolution.
- Look at Britain's takeoff in the 18th century, the start of *"capitalism."*
- Not much change in the other countries during that period.



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Production and Supply

- Supply (the quantities that firms want to produce and sell at various prices) is determined by
  - the amounts of primary factors and intermediate goods needed to produce desired quantities of output,
  - and the opportunity cost of primary factors and intermediate inputs used.

Example: Milk production by Farmer Jones

- To produce and sell milk, Farmer Jones uses:
  - Services of primary factors: farm land, farmers' labor, farmers' skill, dairy cows, barns, milking machinery…
  - Intermediate inputs: grain to feed cows, fuel, electricity, etc.
- The quantity of milk that Farmer Jones wants to sell at each price (his supply) is determined by
  - the quantity of inputs he needs to produce different amounts of milk,
  - and the (opportunity) cost of those inputs.

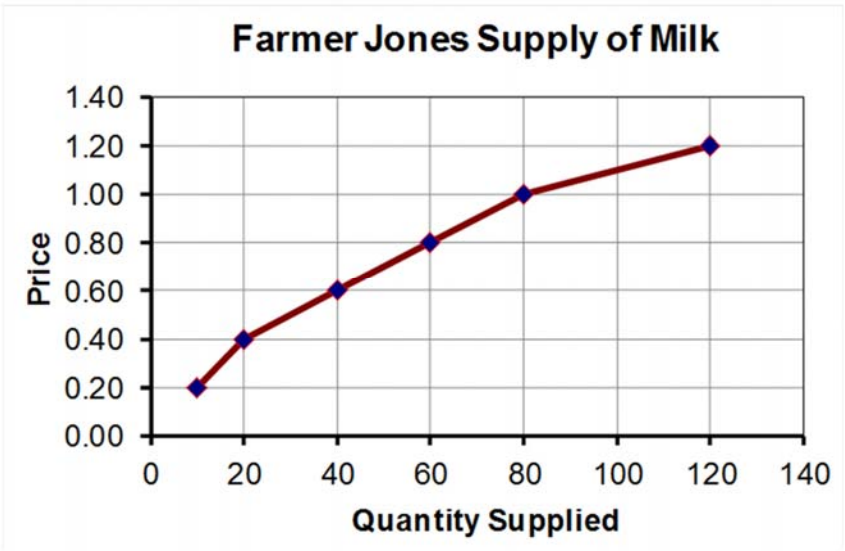
The Supply Schedule

- The supply schedule specifies how much a firm wants to sell at various given prices.
- **Example:** Farmer Jones' supply of milk

Price ($)	Quantity (Qts/mo)
0.20	10
0.40	20
0.60	40
0.80	60
1.00	80
1.20	120

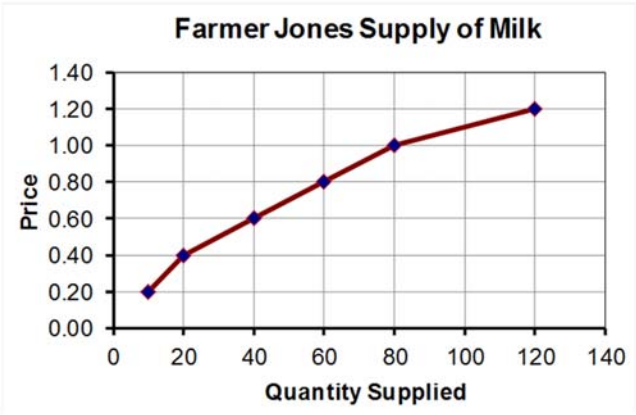
Farmer Jones' Supply Curve

P	Q_s
0.20	10
0.40	20
0.60	40
0.80	60
1.00	80
1.20	120



- How is the supply curve constructed?

- Farmer Jones' Supply curve is ***upward*** Sloping:



- At a low price, he will want to sell only a small quantity of milk.
- But if he is offered a higher price, he will want to sell more milk.

- Why??

Why does Farmer Jones' supply curve slope upward?

- Why is Farmer Jones willing to supply more milk at higher prices?
- If he can earn a profit from producing milk, why doesn't he produce the same amount at all reasonable prices?
- *Answer:* Because higher prices justify using more expensive inputs to increase production.
  - At $.20 per quart of milk, Farmer Jones would let his cows find their own food.
  - At $.40 per quart of milk, he would buy food for them.

- At $.80 per quart of milk, Farmer Jones would hire more farm workers...

- At $1.20 per quart,…

- At high prices, his extra effort would yield more milk and a greater quantity would be supplied.

- Also, at high milk prices, Farmer Jones might stop growing wheat to make room for more cows.

Market Demand

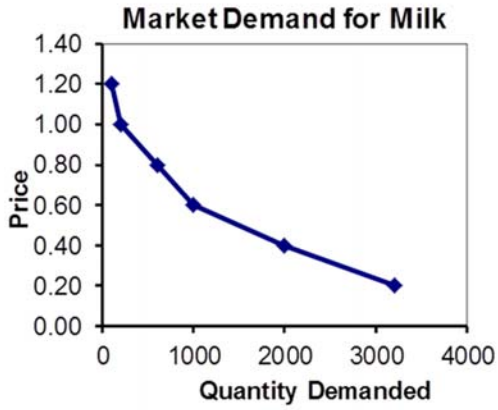
- **Market demand** indicates the total quantity of a good demanded by ***all buyers*** in the market at any given price.

- **Example:** Suppose there are 30 buyers in the market:
  - 10 who are just like Emily
  - and 20 who are just like Jane.
  - What is their market demand?

Price	Quantities		Market Demand for
	Emily	Jane	10 Emilys and 20 Janes
0.20	120	100	10 x 120 + 20 x 100 = 3200
0.40	80	60	800 + 1200 = 2000
0.60	60	20	600 + 400 = 1000
0.80	40	10	400 + 200 = 600
1.00	20	0	200 + 0 = 200
1.20	10	0	100 + 0 = 100

Market Demand Curve

- Market demand is graphed the same way as individual demand.
- ***Price***, the independent variable, remains on the vertical axis.
- Individual quantities demanded at each price are added horizontally to find the ***quantity demanded*** by the entire market.



Market Supply

- The ***market supply*** is the total quantity offered by **all** sellers at various prices.
- **Example:** Suppose there are 30 farmers in the market who are just like *Farmer Jones*. What is the market supply?

Price	Quantity Jones	Market Supply for 30 Farmer Jones'
0.20	10	30 * 10 = 300
0.40	20	30 * 20 = 600
0.60	40	
0.80	60	30 * 60 =1800
1.00	80	30 * 80 =2400
1.20	120	30 *120=3600

- The market supply curve is constructed the same way as the market demand curve is.

Clicker Question

…a primary factor of production?

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