

Thursday, Sept 16, Lecture 5

Production and Supply



The Production Process

- The entire production process is a series of transformations in which inputs generated by the ***primary factors of production***...
- ...gradually become the ***final goods*** and ***services*** used for consumption or as capital goods (tools).
- Inputs at stages of production between primary-factor inputs and the creation of final goods and services are called ***intermediate inputs***.

Primary Factors of Production

- The **primary factors of production** are resources that generate the initial inputs into the productive process.
- Economists usually assign the primary factors to one of three categories:
 - labor
 - capital goods
 - land
- The primary factors exist in limited quantities for long periods of time. They aren't used up during the productive process.

■ What inputs are generated by the primary factors?

- Labor services: Productive work from human beings

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

- Land or Natural-Resource Services: the use of resources provided by nature.

Availability of Primary Factors

- The availability of labor depends on
 - **the working-age population** (influenced by economic and social forces affecting the *previous generation*),
 - and **the labor-force participation rate** (influenced by economic and social forces affecting the *current generation*).
 - These are difficult issues, studied by **demographers** (experts in population) and **labor economists**.

- The availability of capital goods is the result of **capital formation** (the creation of tools).

■ The availability of *land* is determined by nature.

● **Example:** The Great Plains (western US)

● **Exception:** the Back Bay

● The BU campus is located here →

● The dry land around Boston University was...

Clicker Question

Social capital is productive mainly because

- humans are social beings.
- it facilitates voluntary exchange.
- people enjoy parties and other social events.
- happy people work harder.

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 more than **25 times**, 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 from year to year in advanced economies (or it may even shrink).
- Neither does the amount of land or natural resources, almost all created by nature.
- But most modern economies have some saving, investment and capital formation, ...
- ... so that the quantities of physical and human capital increase over time.

Clicker Question

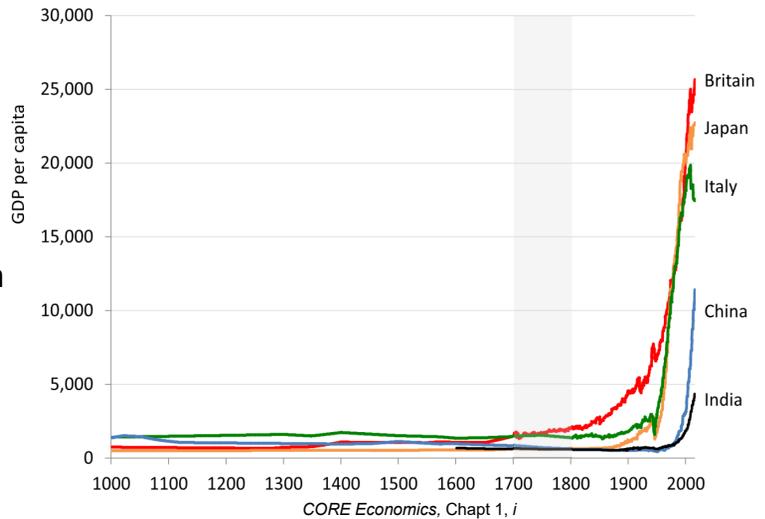
Which country had an annual growth rate per capita of about 10% between 1980 and 2015?

- a. The United States
- b. France
- c. Japan
- d. China

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).

- 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.



How to Promote Capital Formation

- Capital formation requires saving and investment.
- Obtaining savings can be difficult, especially in poor countries.
 - Will poor people save when they need all of their income to feed themselves and their families?
- In free market economies, investment has to be motivated by sufficient demand even when savings are available.
 - Increases in demand can promote the creation of new or expanded firms.
 - Incomes from these firms can increase demand further, a virtuous circle.

Production and Supply

- Supply (the quantities that firms want to produce and sell at each possible price) 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.
 - The selling price must justify production costs.

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.

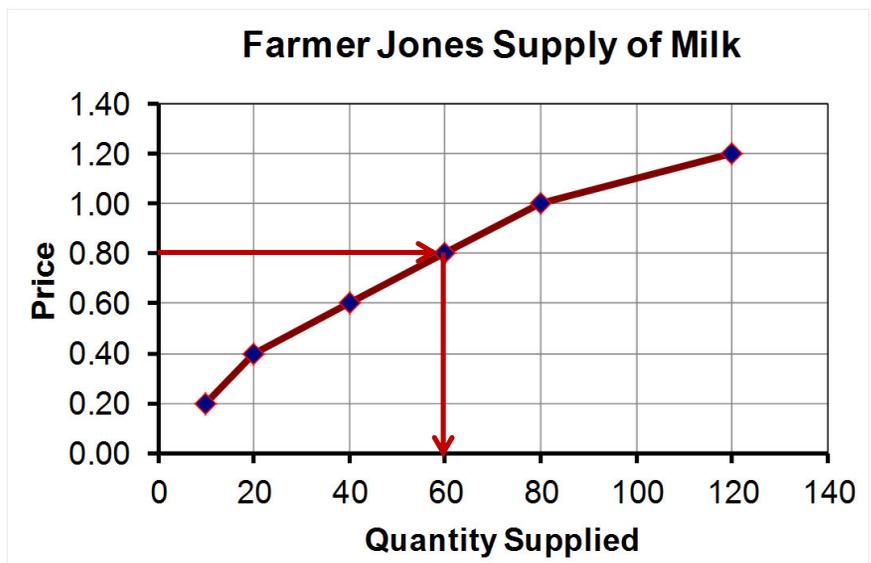
The Supply Schedule

- The supply schedule specifies how much a firm wants to sell at each possible price.
- **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

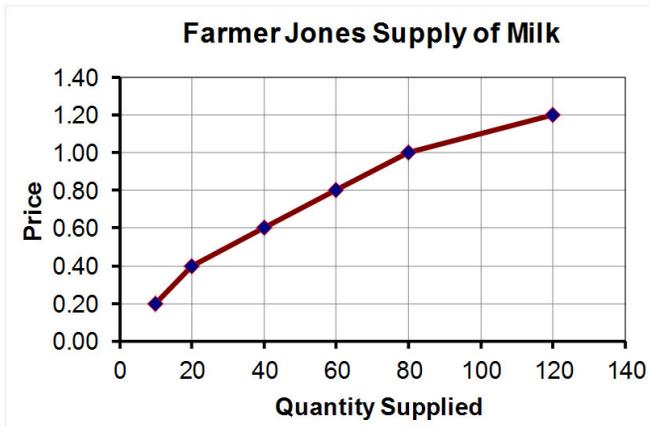
Farmer Jones' Supply Curve

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 tell his cows to 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 farm workers to ...
 - At \$1.20 per quart, he would ...
- The extra cost of producing more milk is justified by high milk prices.
 - Farmer Jones will produce an additional unit whenever the price he gets for that unit is greater than its opportunity cost.

Market Demand

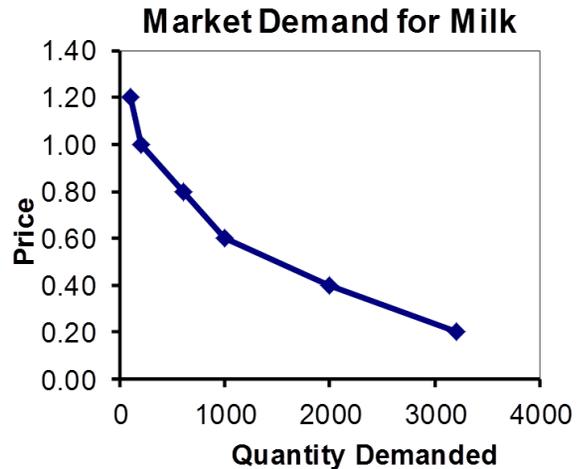
- **Market demand** indicates the total quantity of a good demanded by *all buyers* in the market at any given price.
- **Example:** Suppose there are 30 buyers in the market:
 - 10 who are just like Emily
 - and 20 who are just like Sophie.
 - What is their market demand?

Price	Quantities		Market Demand for
	Emily	Sophie	10 Emilys and 20 Sophies
0.20	120	100	$10 \times 120 + 20 \times 100 = 3200$
0.40	80	60	$800 + 1200 = 2000$
0.60	60	20	
0.80	40	10	
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

Which is NOT a primary factor of production?

- a. Labor
- b. Energy
- c. Capital
- d. Land

End of Lecture 5