

Module 2b

Marco Acosta
Indiana University

15/01/2023

Exchange

Absolute & Comparative Advantage

Economic Growth & Production Function

Economic Growth Rates

Exchange

Exchange

What do you do when...

- ▶ you are hungry?
- ▶ you are sick?

Why do businesses that produce electric cars hire other businesses to provide sandwiches?

Why do we observe so much exchange in the first place?

Preliminary answer

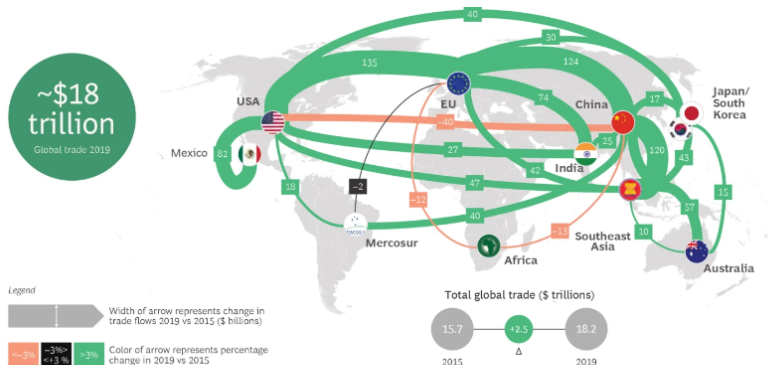
We can each have more of all goods and services through specialization.

All individuals can be made better off if people/firms/countries specialize in certain activities.

But how do we sort into different goods/services in which to specialize?

It is based on what we call **comparative advantage**

Trade Map



Source: UN Contrade; OECD; World Economic Forum; IHS; TradeAlert; BCG analysis.

Note: Corridors represent ~30% of global trade. Not included are: intra EU = ~20%; intra NAFTA = ~8%; China (including Hong Kong) = 4%; intra Southeast Asia = 3%; rest of world = ~35%.

Figure 1: Trade

Absolute & Comparative Advantage

Absolute & Comparative Advantage

Absolute Advantage is the ability to produce more units of a good with fixed amount of resources or producing the same amount with less resources.

Comparative Advantage is the ability to produce a good or service at a lower opportunity cost

Absolute advantage involve comparing productivities while comparative advantage involve comparing opportunity costs.

Absolute & Comparative Advantage

Mike and Andrew scenario

Mikes's PPC

- ▶ 4 pizzas/hour
- ▶ 1 computer/hour

Andrews's PPC

- ▶ 5 pizzas/hour
- ▶ 10 computers/hour

Now, lets determine absolute and comparative advantages

Absolute & Comparative Advantage

Who has the absolute advantage in pizzas?

Who has the absolute advantage in computers?

Absolute & Comparative Advantage

Who has the comparative advantage in pizzas?

Who has the comparative advantage in computers?

Gains from Trade (Autarky)

Autarky is an economic system of self-sufficiency and no trade.

Production in Autarky

	Mike	Andrew	Total
Pizzas	4 hrs X 4 = 16	2 hrs X 5 = 10	26
Computers	4 hrs X 1 = 4	6 hrs X 10 = 60	64

Gains from Trade

Specialization is a method of production whereby an entity focuses on the production of a limited scope of goods to gain a greater degree of efficiency.

Production Specializing

	Mike	Andrew	Total
Pizzas	4 hrs X 8 = 32		32
Computers		8 hrs X 10 = 80	80

Gains from Trade

Gains from Trade

	Mike	Andrew	Total
Pizzas	$32 - 15 = 17$	$0 + 15$	32
Computers	$0 + 5$	$80 - 5$	80

Gains from Trade

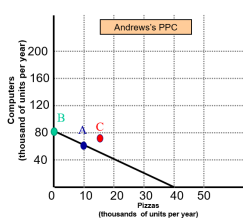


Figure 2: Gains from Trade

Point **A** is Andrew's production and consumption before trade.

Point **B** is Andrew's production after specialization.

Point **C** represents Andrew buying pizzas (w/ computers) from Dub and moves to a point outside his PPC (economic growth!).

Example 2

Wheat and Potato

	Wheat	Potato
China	50	100
India	40	50

Example 2

Comparative Advantage

	Wheat	Potato
China	50 (1 w = 2 p)	100 (1p = 1/2 w)
India	40 (1 w = 1.25 p)	50 (1 p = 0.8 w)

In the wheat column. The opportunity cost (OC) of 1 unit of wheat is 2 units of potato for China. For India the OC of 1 unit of wheat is 1.25 units of potato. India has the lowest OC, thus, India should produce wheat.

Economic Growth & Production Function

Economic Growth

Economic growth is an increase in the amount of goods and services produced per head of the population over a period of time.

In our simple economy of two goods means that it increases the production possibility curve of Potato and beads and we can illustrate economic growth as an outward shift of the production possibilities curve.

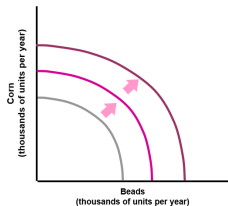


Figure 3: PPC outward Shift

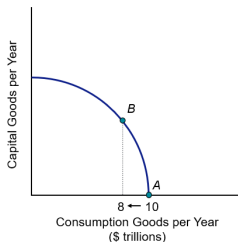
Save for a Rainy Day or Carpe Diem?

The PPC can be used to illustrate the trade-off between present and future consumption.

Consumer goods are goods produced for personal happiness.

Capital goods are goods used to produce other (consumer) goods.

Intertemporal describes any relationship between past, present and future events or conditions.



Save for a Rainy Day or Carpe Diem?

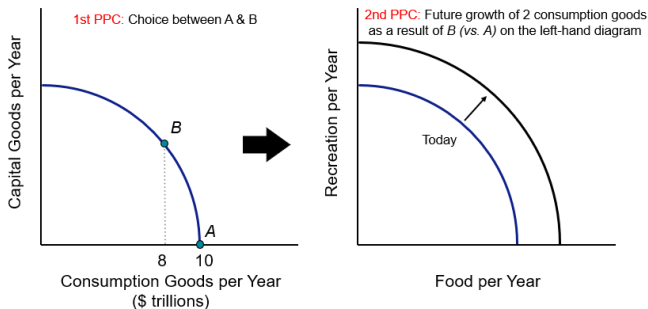


Figure 5: Intertemporal Consumption Change

The Per-Worker Production Function

Output/time period = some function of capital, labor, human capital & natural resources inputs

$$Q = A * f(K, L, H)$$

Q = Real GDP A = Technology K= Capital L = Labor H = Human Capital

The Per-Worker Production Function

The traditional production function per capita takes the form

$$q = A * k^{\alpha}.$$

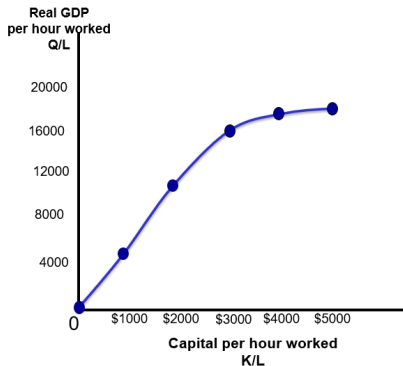


Figure 6: Production Function

The Per-Worker Production Function

Technology change brings economic growth by shifting outward the production function. This means we can produce more with less.

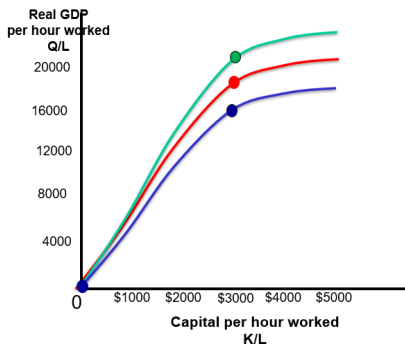


Figure 7: Production Function with Increasing Technology

Economic Growth Rates

The importance of growth rates

Do we need to worry about small differences in the economic growth rate?

Growth rates compound over time.

- ▶ Over long periods of time, even small rates of growth (ex. 2%) have large effects.
- ▶ These differences grow exponentially over time.

$$GDP_t = GDP_{t-1} * (1 + r)^n$$

GDP = Gross Domestic Product, r = the growth rate, and n = number of years.

Economic Growth: Rule of 70

It is often helpful to see how long it takes for an economic variable (RGDP per capita) to double

A useful shortcut called the Rule of 70 can help us to determine how long it will take for an economic variable to double:

$$\text{Number of Years to double} = \frac{70}{\text{growth rate}}$$

Economic Growth: Exponential Growth

If you save \$1,000 (\$83 month, \$21 week) a year at 6% for 50 years how much will it be worth? \$291,379

If you save \$1000 a year at 8% for 50 years how much will it be worth? \$577,244

Growth Rates

Year	Saving	6%	8%	Differences
1	\$1,000			
2	\$1,000	\$1,060	\$1,080	\$20
3	\$1,000	\$2,124	\$2,166	\$43
48	\$1,000	\$241,974	\$455,658	\$213,684
49	\$1,000	\$257,492	\$493,111	\$235,618
50	\$1,000	\$273,942	\$533,560	\$259,618
Total		291,379	577,244	285,866

Economic Growth: Exponential Growth

Exponential Growth

Number Years	of	3%	4%	5%	6%	8%	10%	20%
1		1.03	1.04	1.05	1.06	1.08	1.1	1.2
2		1.06	1.08	1.1	1.12	1.17	1.21	1.44
3		1.09	1.12	1.16	1.19	1.26	1.33	1.73
4		1.13	1.17	1.22	1.26	1.36	1.46	2.07
5		1.16	1.22	1.28	1.34	1.47	1.61	2.49
6		1.19	1.27	1.34	1.41	1.59	1.77	2.99
7		1.23	1.32	1.41	1.5	1.71	1.94	3.58
8		1.27	1.37	1.48	1.59	1.85	2.14	4.3
9		1.3	1.42	1.55	1.68	2	2.35	5.16
10		1.34	1.48	1.63	1.79	2.16	2.59	6.19
20		1.81	2.19	2.65	3.2	4.66	6.72	38.3
30		2.43	3.24	4.32	5.74	10	17.4	237
40		3.26	4.8	7.04	10.3	21.7	45.3	1,470
50		4.38	7.11	11.5	18.4	46.9	117	9,100