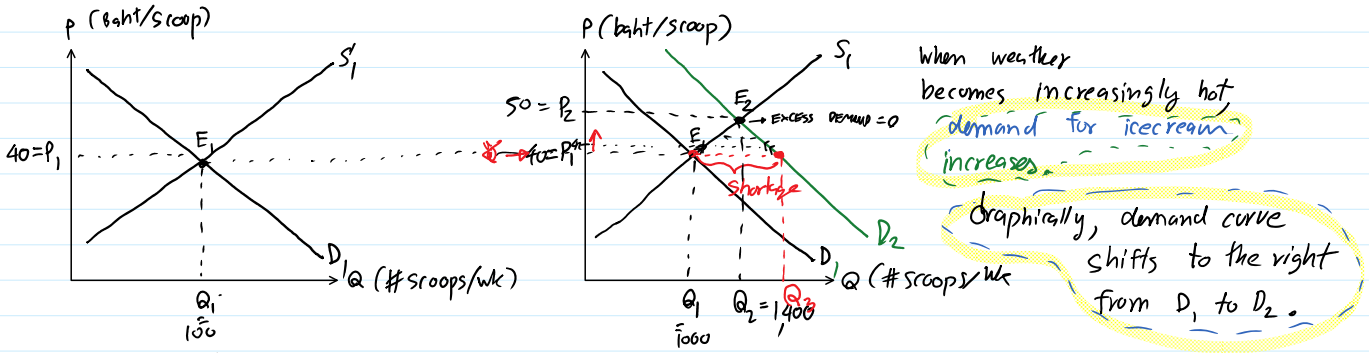
Tools used in Microeconomics (Continued)

② Comparative Static Analysis (or Before-and-After Analysis)

Consider market for icecream...



When weather becomes increasingly hot, demand for icecream increases.

Graphically, demand curve shifts to the right from D_1 to D_2.

(BEFORE)
P_1 = 40 baht/scoop
Q_1 = 1000 scoops/wk

(AFTER)
P_2 = 50 baht/scoops
Q_2 = 1,400 scoops/wk

Effect on P: P ⇧
Effect on Q: Q ⇧

③ Constrained Optimization (= do your best given available resources)

Ex: A Consumer

Maximize Utility/satisfaction
Subject to Budget Constraint

Consider 2 goods: X (movies) & Y (meals)

- P_x = Price of good X (Baht/ticket)
- P_y = Price of good Y (Baht/Bowl)
- M = consumer's income (Baht/wk)

Maximize $U(x, y)$
Subject to $P_x \cdot X + P_y \cdot Y \leq M$
(Total expenditures)

$(X^* = ?, Y^* = ?)$ → max Utility

We call "Utility Maximization Problem" (UMP) he is facing w/.

Production Possibility Curve (PPC)

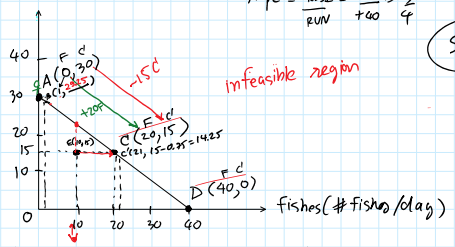
Consider Mr. Tom. He has 24 - 8 = 16 working hours/day.

- He can "allocate" his 16 hrs/day into 2 production activities:
  - Catching Fishes
  - Gathering coconuts.

- If he is efficient and spend 16 hrs on the sea, maximum amount of fishes he could obtain = 40 fishes/day.
- "——" on the trees, maximum amount of coconuts he could obtain = 30 coconuts/day

coconut (# units/day)

slope = RISE/RUN = $\frac{-30}{+40} = -\frac{3}{4}$



infeasible region

Scarcity → Choice → opportunity costs

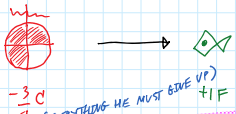
Fact#1 Line AD is so called "Tom's Production Possibility Curve (PPC)"

PPC tells us all various combinations of Tom's production choice that he could possibly produce given his available resources and given his current production technology.

Fact#2
- Choices "outside" the PPC are... infeasible to produce (Why?)
- Choices "on" the PPC are... feasible to produce & efficient.
- Choices "inside" the PPC are... feasible to produce BUT inefficient. ☹

Fact#3 To get +20F, he must give up -15C

"——" +1F, he must give up $\frac{-15}{+20} = -\frac{3}{4}$ or -0.75C



Formally, Opportunity cost of having an additional unit of fish is equal to... $\frac{3}{4}$ or 0.75 unit of coconut forgone!

Slope of Mr. Tom's PPC reflects this opportunity cost

Here, slope of the PPC = $-\frac{3}{4}$.

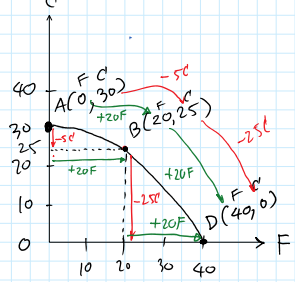
the minus sign reflects the trade-off

Slope of PPC = opportunity cost of having an extra unit of fish measured in terms of how many unit(s) of coconut he must give up.

In this case, when PPC is a straight line, the opp. cost is constant. (here, slope = $-\frac{3}{4}$ or -0.75)

Fact#4 In reality, opp. cost is not constant, but increasing.

Modified case

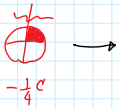


- Here, PPC is bowed outward when looking from the origin (Viewed)
- From A → B

  To get 20F, he must give up -5C

  "——" 1F, "——" $\frac{-5}{+20} = -\frac{1}{4}$ or -0.25C

  So, opp. cost of a fish = $-\frac{1}{4}$ or -0.25 coconut



- From B → D

  To get 20F he must give up -25C

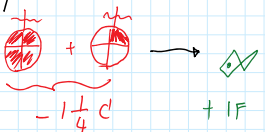
$-\frac{1}{4}C$ $+1F$

- From B → D

To get 20F, he must give up $-25C$

" 1F, " $\frac{-25}{+20} = -1\frac{1}{4}$ or $-1.25C$

So, opp. cost of a Fish = $-1\frac{1}{4}$ or -1.25 coconuts.



$-1\frac{1}{4}C$ $+1F$

w/ concave PPC, it shows that opp. cost of a fish is not constant, but increasing !!! (Why?)

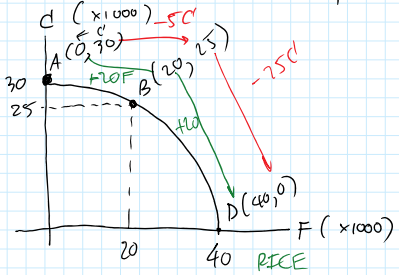
Fact #5 Q: Why opp. cost is increasing?

A: b/c of differences in specialization of resources.

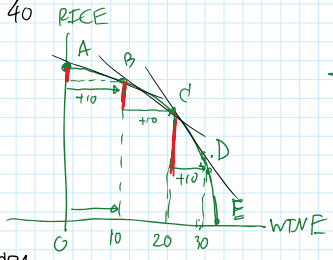
Suppose MR. tom has 100 workers

Some are good at catching fishes

Some are good at gather coconuts



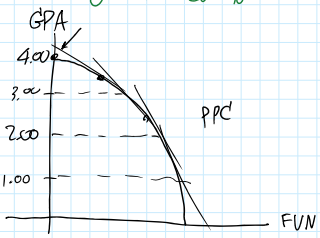
Ex2



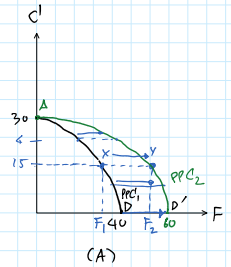
lands — Some plots are good at growing rice

Some plots are good at growing grape (for wine)

Ex 3

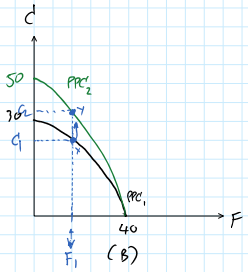


Fact#6 Improvement in production technology can shift/expand a PPC...



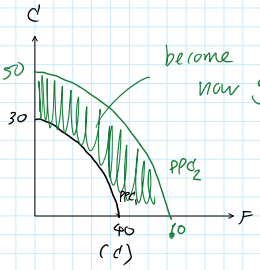
(A)

w/ fishing rod



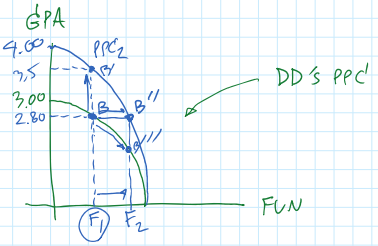
(B)

w/ ladder



(C)

w/ fishing rod + w/ ladder



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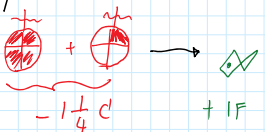

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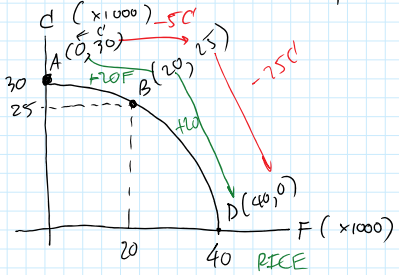

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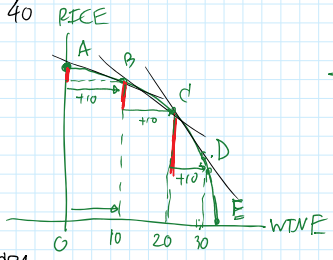

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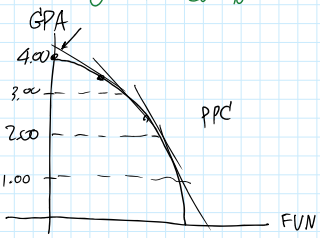

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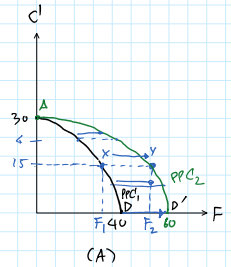
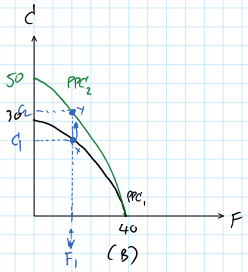


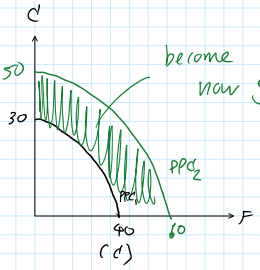
(A)

w/ fishing rod



(B)

w/ ladder



(C)

w/ fishing rod + w/ ladder