BRIEF INTRO TO NEO-CLASSICAL MODEL

- New more realistic way to depict technology
- Technology feeds in costs.
- Together technology and costs determine production.

1. PRODUCTION UNDER AUTARKY

Technology → Combinations of L and K to produce the good

Example: K=2 L=10 give X=20 } Allows factors to substitute

K=1 L=20 give X=20 } - More realistic

Example: K=textbook L=4 hours give Grade=B+

K=textbook + class notes L=3 hours give Grade=B+

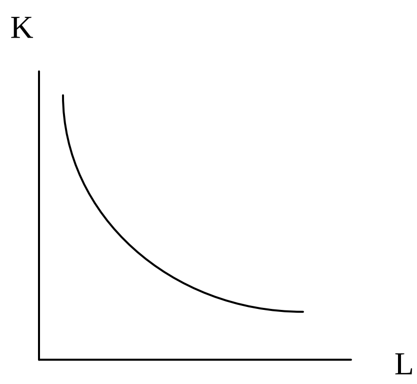
(1) **Production Function**: Way to represent technology

$$X = F_x(L_x, K_x)$$

$$Y = F_y(L_y, K_y)$$

(2) **Isoquants:** Another representation

Definition: All possible combinations of L and K that can be used to produce given amount of output.



Properties: 1) Downward sloping: that is, K and L are substitutes in production. If you hire more of L, you can reduce K while maintaining output.

2) Convex : that is, the degree of substitutability changes. As you hire more and more workers, you will be able to reduce K usage but in decreasing amounts!

(3) <u>Isocost Lines</u>

You are producing X using K units and L units

Cost of K = r.K
Cost of L = w.L
→ Total Cost: C = r.K + w.L

Ex: w = $1/hour L=10 hours

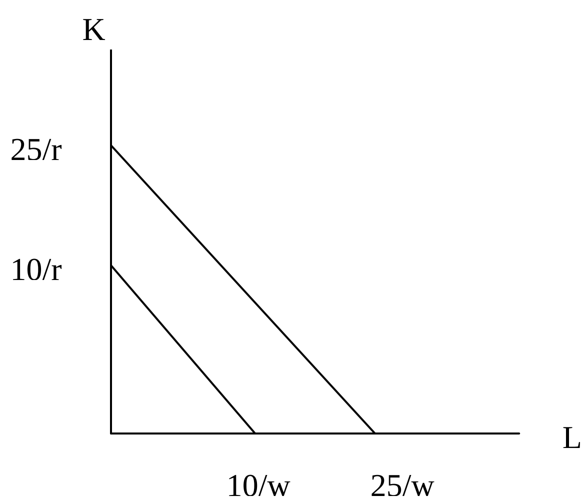
r = $5/machine K= 3 machines

So, C = ($1/~~hour~~)(10 ~~hours~~) +($5/~~machine~~)(3 ~~machines~~) = $25

<u>Graphically</u>, isocost at C=$25 is <u>straight line</u>.

L=0 then 25=r.K (spend only on capital) → K=25/r

K=0 then 25=w.L (spend only on labor) → L=25/w



** Slope = $\Delta K/\Delta L$ = [(25/r)-0] / [0-(25/w)] = -w/r **

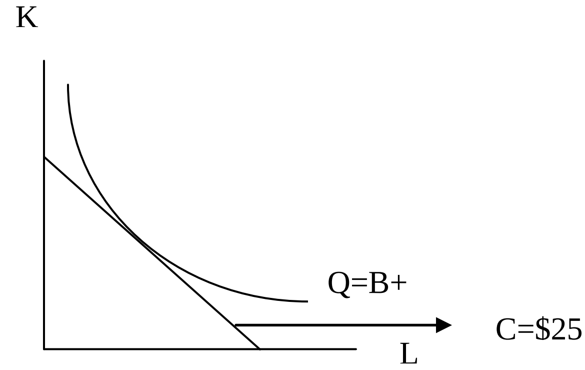
Suppose C=$10 then isocost lies <u>inward</u>

<u>Firms Problem</u>

Max Qty Given Cost
↕
Min Cost Given Qty

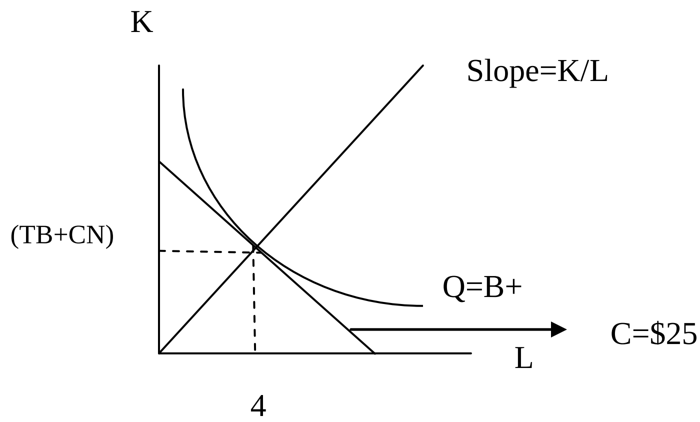
So, Grade=B+ can be produced at Min Cost of $25

Or Cost=$25 can give Max Grade = B+



(4) Firms problem gives Optimal Inputs requirement to produce Grade=B+

ln equilibrium ** K&L ratio = K/L = (Textbook + Class Notes)/4 **



2. RELATION TO RICARDIAN MODEL

a_{LX} = # units of L needed to produce 1 X

= L_X^*/X^*

= # units of K needed to produce 1 X

= K_X^*/X^*

Thus, ** $K^*/L^* = a_{KX}/a_{LX}$ ** → Production coefficients NOT FIXED anymore

→ If wage ↑, firm will reduce use of L (to keep cost=$25)

⇨ (K/L) ↑

Further, ** K^*/L^* in industry X ≠ K^*/L^* in industry Y ** even when w and r are the same

Reasons: Production functions are different in the two industries

Definition: Good X is capital-intensive if

** $(K_X^* / L_X^*) > (K_Y^* / L_Y^*) \rightarrow (a_{KX} / a_{LX}) > (a_{KY} / a_{LY})$ **

A good CANNOT be both K-intensive and L-intensive.

3. SHAPE OF PPF – CONCEPT ON INCREASING COST

The fact that firms produce X and Y using different K/L ratios → PPF will be CONCAVE

Suppose F is L-intensive, C is K-intensive } → $(a_{KC} / a_{LC} = 1/3) > (a_{KF} / a_{LF} = 2/10)$

Suppose reduce production of F by 1 unit

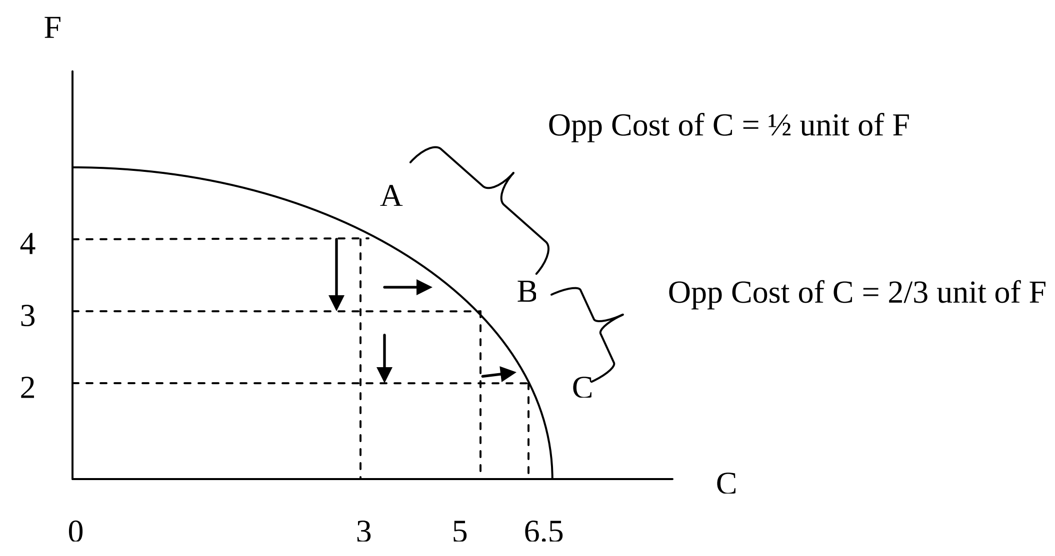
→ Release of L=10 units and K=2 units into the economy

→ Can produce 2 extra units of C (use L=6 and K=2) but 4 units of L are wasted

⇨ This waste leads to increasing opportunity costs of producing C

→ If we reduce F by another unit then we will get extra C = 1.5 units

Thus, PPF is concave because every unit of a good that we stop producing releases factors in the WRONG PROPORTION for the production of the other good.



Note: Just like in Ricardian Model

Slope of PPF = Opp Cost of C in terms of F

= # of units of F that must be given up to get 1 extra unit of C

4. EQUILIBRIUM UNDER AUTARKY

Suppose tastes are such that under autarky

In country A, $P_F^A/P_C^A = 2$
In country B, $P_F^B/P_C^B = 2$
} Price ratios reflect both opportunity cost and tastes

Trade: ** $(P_F^A/P_C^A)^{Autarky} > (P_F^B/P_C^B)^{Autarky}$ → B will export F and A will export C **

- There exist benefits from specialization
- Argument is the same as that in Ricardian Model
- There will be INCOMPLETE SPECIALIZATION
  - Reason: As A raises production of C (moving downward on PPF), opp cost of C keeps on rising (decreasing in benefits from specialization). There will be one point where specialization will stop.
- International Term of Trade
  - $(P_F^A/P_C^A)^{Autarky} > (P_F/P_C)^{World} > (P_F^B/P_C^B)^{Autarky}$