

# Chapter 3

## The Standard Theory of International Trade

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### Last lecture review

- Basis for trade/ Gains from trade/ Pattern of trade
- Mercantilism/ Zero –sum game/ Government intervention/Trade surplus
- Absolute advantage/Theory of absolute advantage
- Laissez-faire
- Comparative advantage/Theory of comparative advantage
- Labor theory of value
- OC/Formula
- PPF
- Constant OC
- PPF under constant OC/Identify Comparative Advantage based on PPF
- Internal relative commodity prices (pre-trade relative commodity price – autarky relative commodity price)
- The range of relative commodity price for mutual benefits
- Complete specialization
- Consumption and production points before and after trade

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### Lecture overview

- PPF with increasing opportunity costs
- Community Indifference Curve
- Equilibrium in Isolation
- Gains from trade with increasing costs

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## PPF with increasing opportunity costs

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## Increasing Opportunity Costs (IOPs)

### ■ Concept of IOCs

- IOCs means that the nation must give up more and more of one commodity to release just enough resources to produce each additional unit of another commodity.
- E.g: country A

Wheat (million ton/year)	Cloth (million meter/year)
180	0
150	20
110	40
60	60
0	80

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## Reason for IOCs

- Factors of production are not homogenous
- Factors of production are not used in the same fixed proportion or intensity
- E.g: learning and playing
- E.g: rice and milk production

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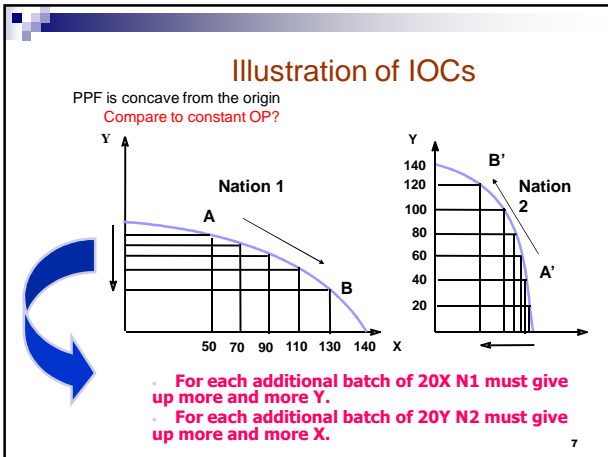
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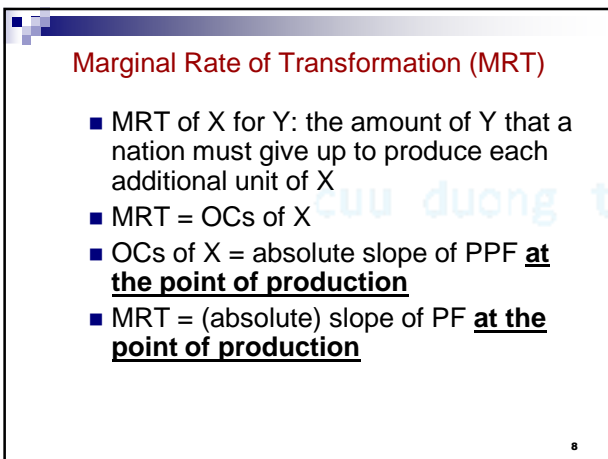
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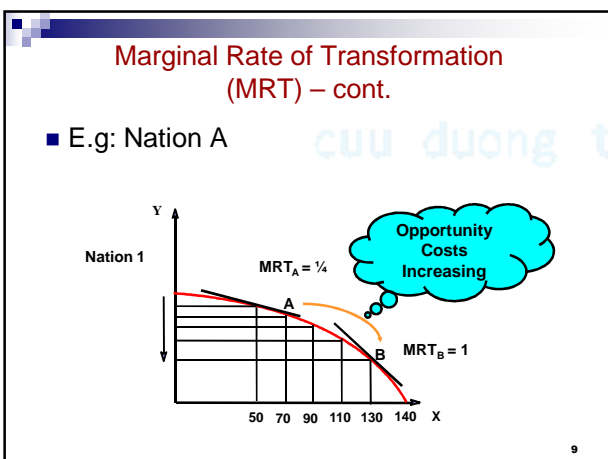
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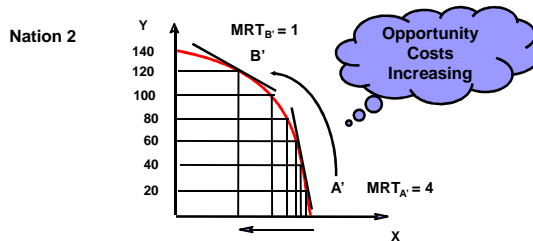
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## Marginal Rate of Transformation (MRT) – cont.



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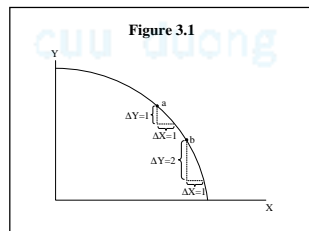
## Marginal Rate of Transformation (MRT) – cont.

- $MRT_{Y/X} = \text{OC of producing X}$

$$MRT_{Y/X} = \frac{\Delta Y}{\Delta X}$$

- $MRT_{X/Y} = \text{OC of producing Y}$

$$MRT_{X/Y} = \frac{\Delta X}{\Delta Y}$$



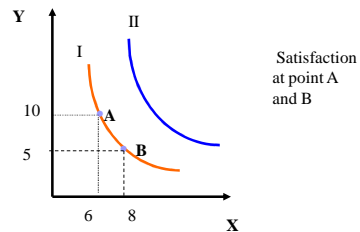
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## COMMUNITY INDIFFERENCE CURVE

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## Concept of CICs

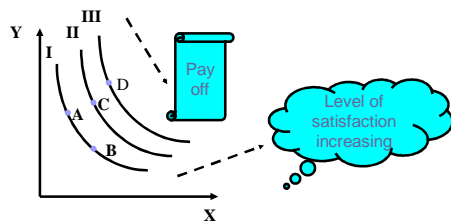
- Community Indifference curves (CICs):
  - various combinations of two commodities that yield equal satisfaction to the community or nation.



13

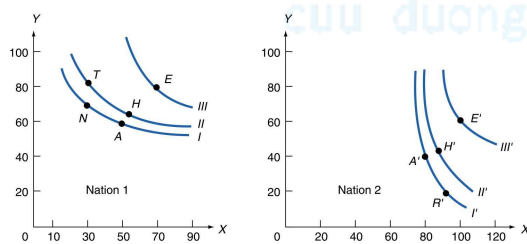
## Characteristics of CICs

- CIC refers to level of satisfaction
- Higher CIC means higher or greater level of satisfaction.
- CICs are negatively slope
- CICs are convex from the origin.
- CICs must not cross.



14

## Illustration of CICs



Why are CICs of two nations different?

15

## Marginal Rate of Substitution

How to identify the amount of Y a Nation must give up in order to consume one additional unit of X so that the satisfaction remains the same ?



### Marginal Rate Of Substitution (MRS)

- MRS of X for Y ( $MRS_{Y/X}$ ) in consumption: the amount of Y that a nation could give up for one extra unit of X and still remain on the same indifference curve.
- $MRS_{Y/X} = 1.5???$

16

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## Marginal Rate of Substitution (cont.)

- MRS is measured by the (absolute) slope of CIC at the point of consumption



- When moving from left to right, how will MRS change?  
MRS declines as the Nation moves down the curve.  
What does it mean?
  - as more of X is consumed, each additional unit becomes worth less in consumption
  - as less of Y is consumed, each additional unit becomes worth more in consumption
  - CIC is convex from the origin
- Compare with PPF and MRT?

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## EQUILIBRIUM IN ISOLATION

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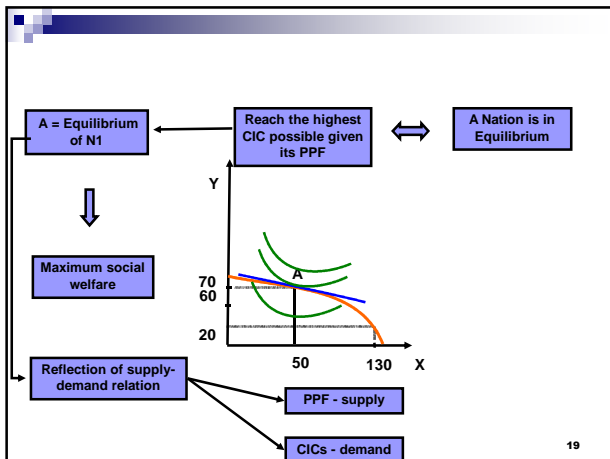
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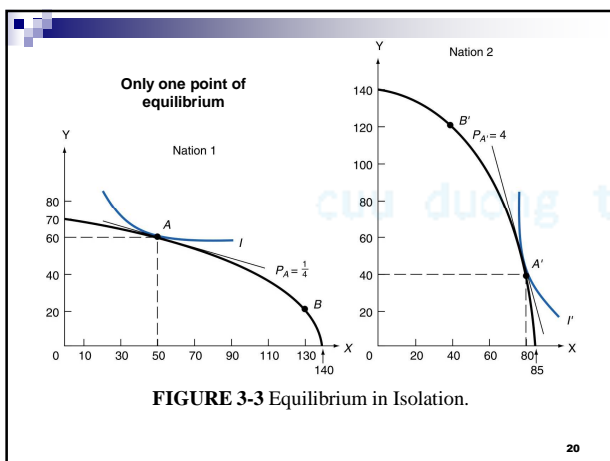
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### Equilibrium – relative commodity price and comparative advantage

- The equilibrium - relative commodity price of a Nation is given by the slope of the common tangent to its PPF and its highest IC at the autarky point of production and consumption.
- Identify equilibrium – relative commodity price of
  - Nation 1?
    - $P_A = P_X/P_Y = 1/4$
  - Nation 2?
    - $P_{A'} = P_X/P_Y = 4$
- Which country has comparative advantage in producing good X? good Y?
  - Nation 1: good X
  - Nation 2: good Y

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## Gains from trade with increasing costs

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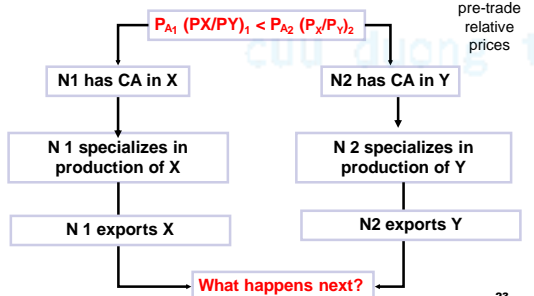
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## Basis for and Gains from trade

- Difference in relative commodity price: a reflection of their comparative advantage => basis for mutually beneficial trade



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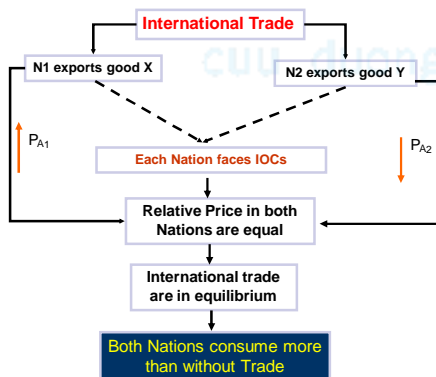
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## Basis for and Gains from trade

For trade to take place and benefit both countries, how much the common relative price?

How do relative price of good X in Nation 1 and Nation 2 change ?



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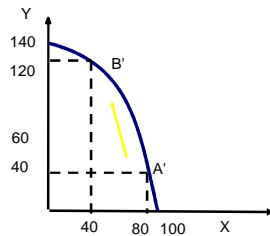
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### Illustration of the basis for and gains from trade



With trade N2 moves from point A' to point B' faces IOC in production additional unit of Y. The slope of PPF is smaller.

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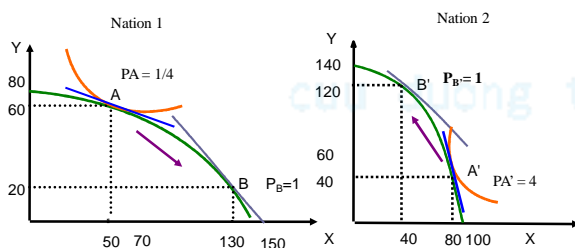
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### Illustration of the basis for and gains from trade



The process of specialization continues until the relative prices of two nations are equal. At that price international trade is in equilibrium. =>  $P_B = P_{B'} = 1$

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### Illustration of the basis for and gains from trade (cont.)

- For trade to take place and result in mutual benefit, what is the range of common relative price?
- What is the common relative price that yields equal benefit?
- What are the production points before and after trade of each nation?
- What are the consumption points before trade of each nation?
- On which lines/curves do two consumption points after trade of each nation lie?

27

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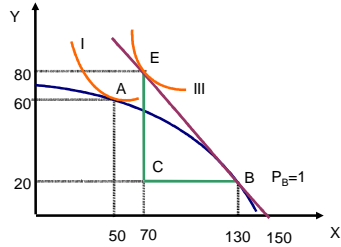
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### Illustration of the basis for and gains from trade (cont.)

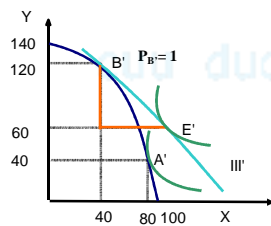


BE: trade line.

With trade N1 moves from point A (50X, 60Y) -> point B (130X, 20Y). Then N1 exchanges 60X for 60Y of N2 => N1 consumes at E (70X, 80Y) on the CIC III. N1 gains 20X and 20Y

28

### Illustration of the basis for and gains from trade (cont.)



B'E': trade line.

With trade, N2 moves up from point A' -> point B' (40X, 120Y). Then N2 exchanges 60Y for 60X => N2 consumes at E' (100X, 60Y) on the CIC II'. N2 gains 20X and 20Y

29

### Illustration of the basis for and gains from trade (cont.)

- With trade, consumption of two Nations increases.
- With trade, each Nation can consume at the point that above its PPF

30

### Equilibrium – Relative Commodity Prices with Trade

- The equilibrium – relative price with trade is common relative price in both nation at which **trade is balanced**
- There is only one price at which trade is balanced.
  - $P_B = P_{B'} = 1$ ?

31

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### Equilibrium – Relative Commodity Prices with Trade

- Trial & Error method
  - Trial: suppose equilibrium relative price with trade is  $P_X/P_Y = 2$ 
    - N1 wants to export more X
    - N2 wants to import less X
    - =>  $P_X/P_Y$  reduces toward  $P_X/P_Y = 1$
  - Trial: suppose  $P_X/P_Y = \frac{1}{2}$ 
    - N1 wants to export less X
    - N2 wants to import more X
    - =>  $P_X/P_Y$  increases towards  $P_X/P_Y = 1$
    - =>> International trade is balanced at  $P_X/P_Y = 1$

32

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### Key words

- Increasing OCs
- MRT
- Community Indifference Curve
- MRS
- Autarky
- Equilibrium in isolation
- Equilibrium – relative commodity price in isolation (Pre-trade relative price)
- Equilibrium with trade
- Equilibrium – relative commodity price with trade (common relative price)
- The range of possible common relative prices
- Trade is balanced

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**END OF THE CHAPTER  
THANK YOU**

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