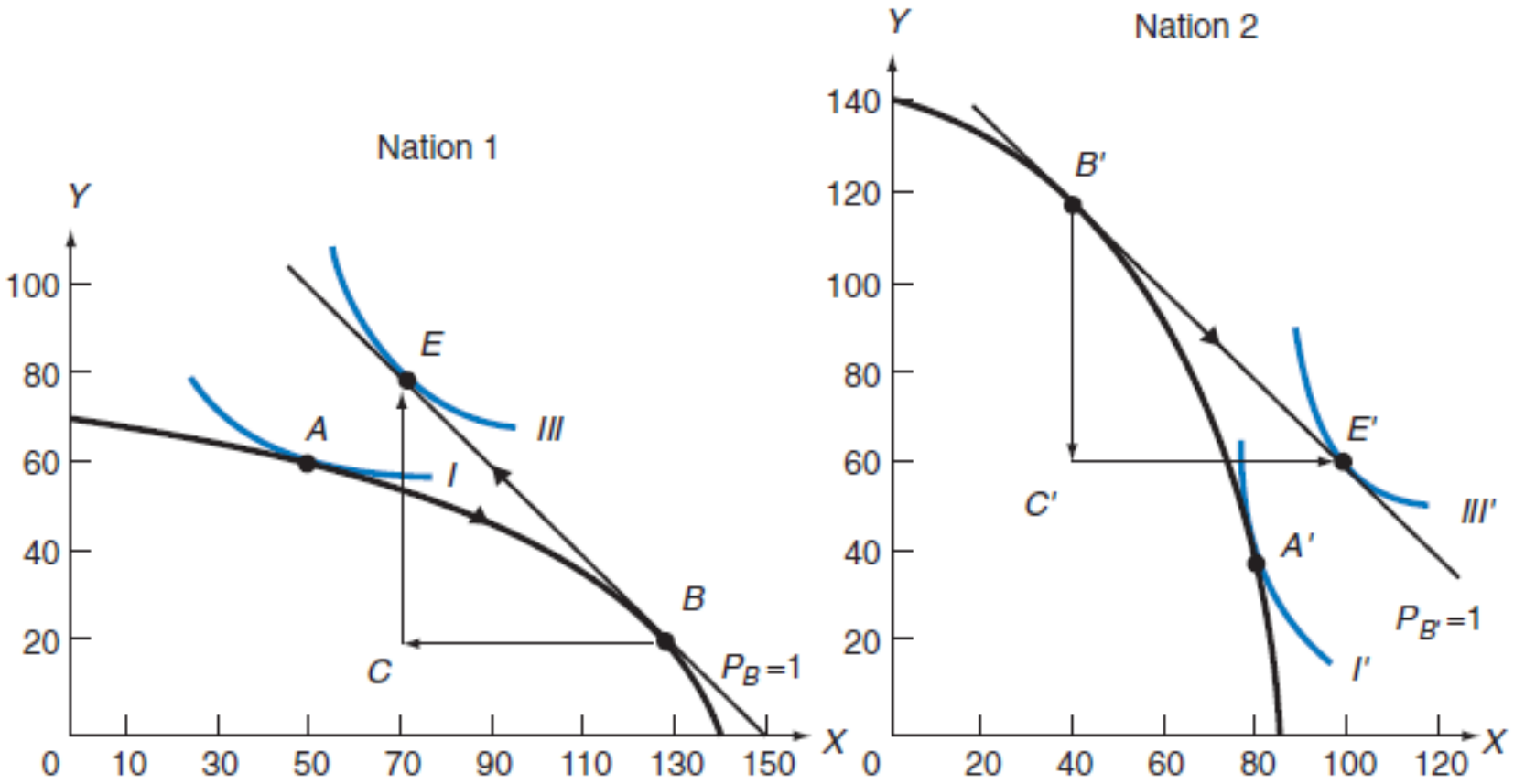
International trade

L7

Gains from trade with Increasing cost



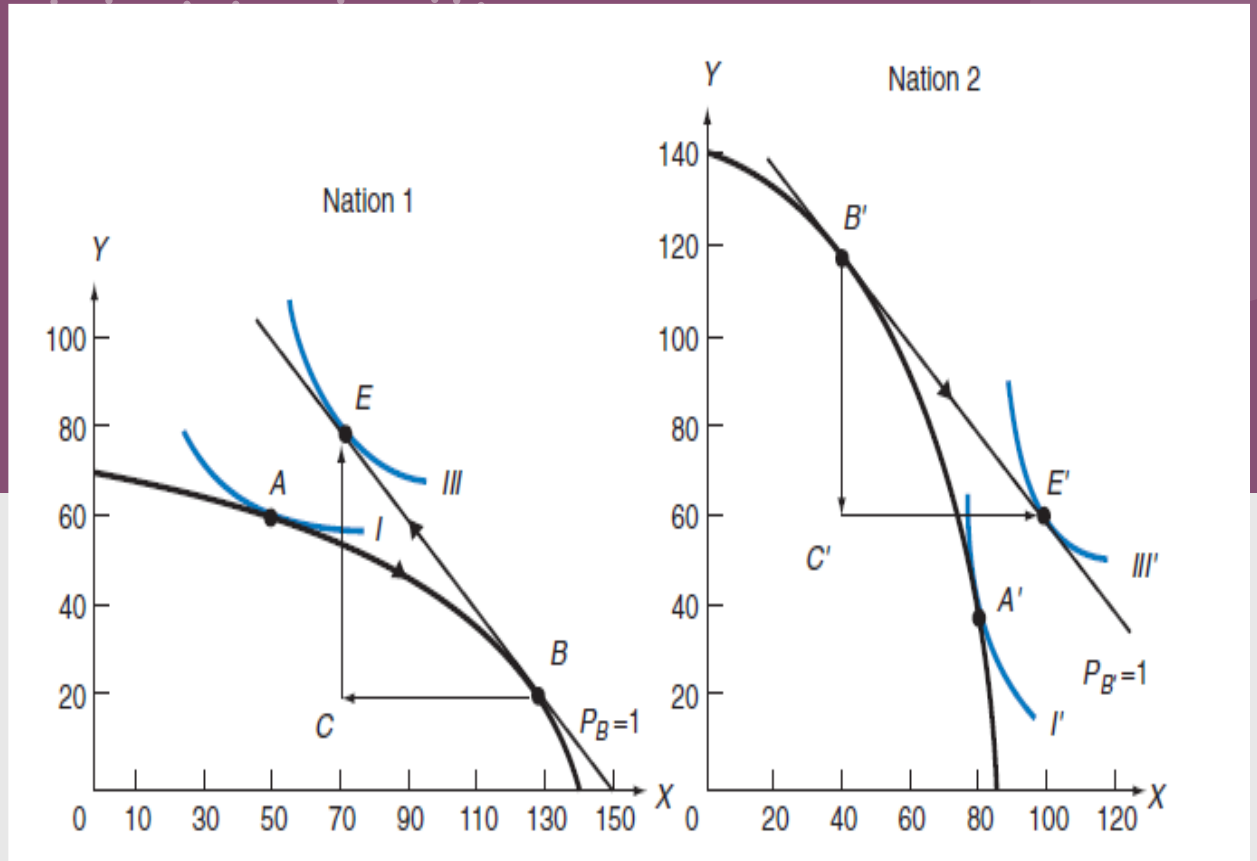
Incomplete specialization (Constant OC v/s Increasing OC)

- Under constant costs, both nations specialize completely in production of the commodity of their comparative advantage (i.e., produce only that commodity).
- From the constant opportunity cost example , the United States specialized completely in wheat production, and the United Kingdom specialized completely in cloth production.
- In contrast, under increasing opportunity costs, there is incomplete specialization in production in both nations.
- For example, while Nation 1 produces more of X (the commodity of its comparative advantage) with trade, it continues to produce some Y (see point *B* in Fig). Similarly, Nation 2 continues to produce some X with trade (point *B'* in Fig).

Incomplete specialization (Constant OC v/s Increasing OC)

- The reason for incomplete specialization is that as Nation 1 specializes in the production of X, it incurs increasing opportunity costs in producing X (and declining OC of Y).
- Similarly, as Nation 2 produces more Y, it incurs increasing opportunity costs in Y (which means declining opportunity costs of X).
- Thus, as each nation specializes in producing the commodity of its comparative advantage, relative commodity prices move toward each other (i.e., become less unequal) until they are identical in both nations.
- At that point, it does not pay for either nation to continue to expand production of the commodity of its comparative advantage. This occurs before either nation has completely specialized in production.

Equilibrium-Relative Commodity Prices with Trade



- This **process of specialization** in production **continues until relative commodity prices** (the slope of the production frontiers) become **equal** in the two nations.
- The common relative price (slope) with trade will be somewhere **between the pre-trade relative prices of 1/4 and 4, at the level at which trade is balanced.** In Figure , this is

$$\text{is } \boldsymbol{P_B = P_{B'} = 1}$$

Line *BE* is called the *trade possibilities line* or, simply, ***trade line*** because trade takes place along this line

Example : gains from trade changes for each nation as per change in relative price

	Nation 1	Example	Nation 2	Example
Autarky	${}^{P_x}/_{P_Y} = 1/4$ (i.e. ¼ units of y forgone for 1 unit of x)	60x=15Y	${}^{P_x}/_{P_Y}$=4 (i.e. 4 units of y for 1 unit of x)	240 Y= 60 X 30 Y = 7.5 X
Trade (case 1)	${}^{P_x}/_{P_Y}$=1/2	60x=30Y (N1:Gain from trade 15 Y)	${}^{P_x}/_{P_Y}$=1/2	30 Y= 60 X (N2:Gain 52.5 X) N2 is more interested to trade than N1
Trade (case 2)	${}^{P_x}/_{P_Y}$=1	60x=60Y (N1:Gain 45 Y)	${}^{P_x}/_{P_Y}$=1	60Y=60X Or 30 Y= 30 X (N2:Gain 22.5 X)
Trade (case 3)	${}^{P_x}/_{P_Y}$=2	60x=120Y (N1:Gain 105 Y) N1 is more interested to trade than N2 N1 is interested to export	${}^{P_x}/_{P_Y}$=2	120Y=60X Or 30 Y= 15 X (N2:Gain 7.5 X)

Equilibrium-Relative Commodity Prices with Trade

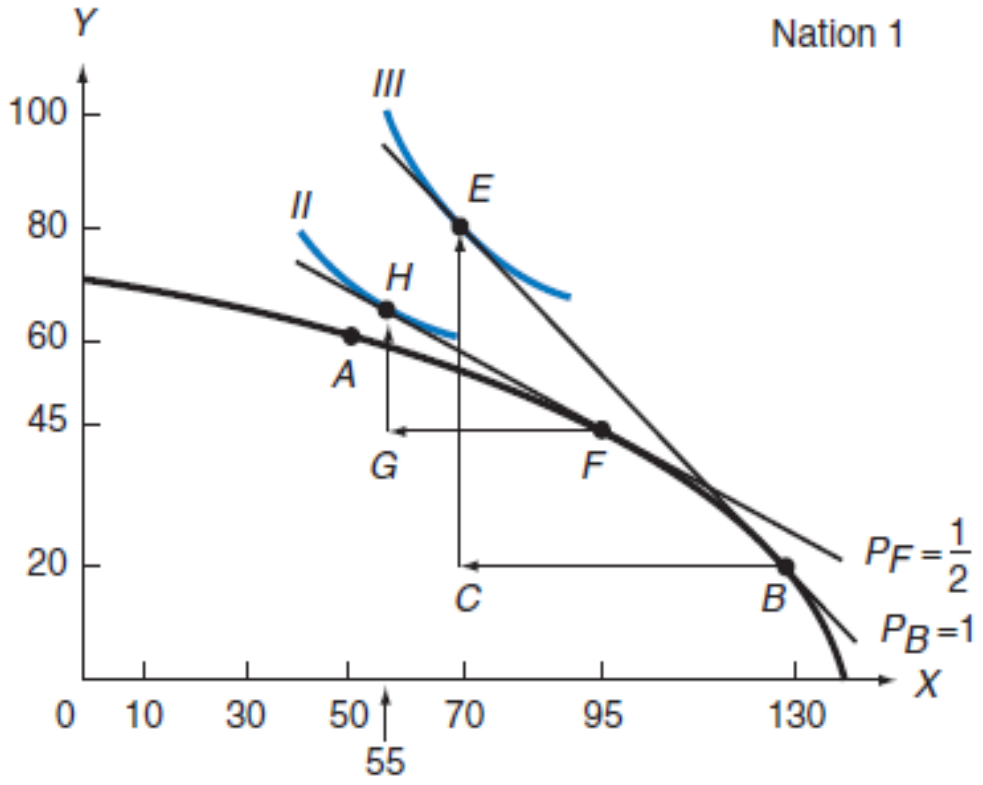
- **The equilibrium-relative commodity price with trade is the common relative price in both nations at which trade is balanced.** In Figure, $\boldsymbol{P_B = P_{B'} = 1}$
- At this relative price, the amount of X that Nation 1 wants to export (60X) equals the amount of X that Nation 2 wants to import (60X).
- Similarly, the amount of Y that Nation 2 wants to export (60Y) exactly matches the amount of Y that Nation 1 wants to import at this price (60Y).
- **Any other relative price could not persist because trade would be unbalanced.**
- For example, at $^{P_X}/_{P_Y} = 2$, Nation 1 would want to export more of X than Nation 2 would be willing to import at this high price. As a result, the relative price of X would fall toward the equilibrium level of 1.
- Similarly, at a relative price of X lower than 1, Nation 2 would want to import more of X than Nation 1 would be willing to export at this low price, and the relative price of X would rise. Thus, the relative price of X would gravitate toward the equilibrium price of 1
- **The equilibrium relative price is determined by the total demand and supply curve of each commodity in each nation or the so-called offer curves**

Offer curves/ Reciprocal demand curves

- Introduced into international economics- by Alfred **Marshall** and Ysidro **Edgeworth**.
- Offer curves incorporate elements of both demand and supply.
- It shows the nation’s willingness to import and export at various relative commodity prices

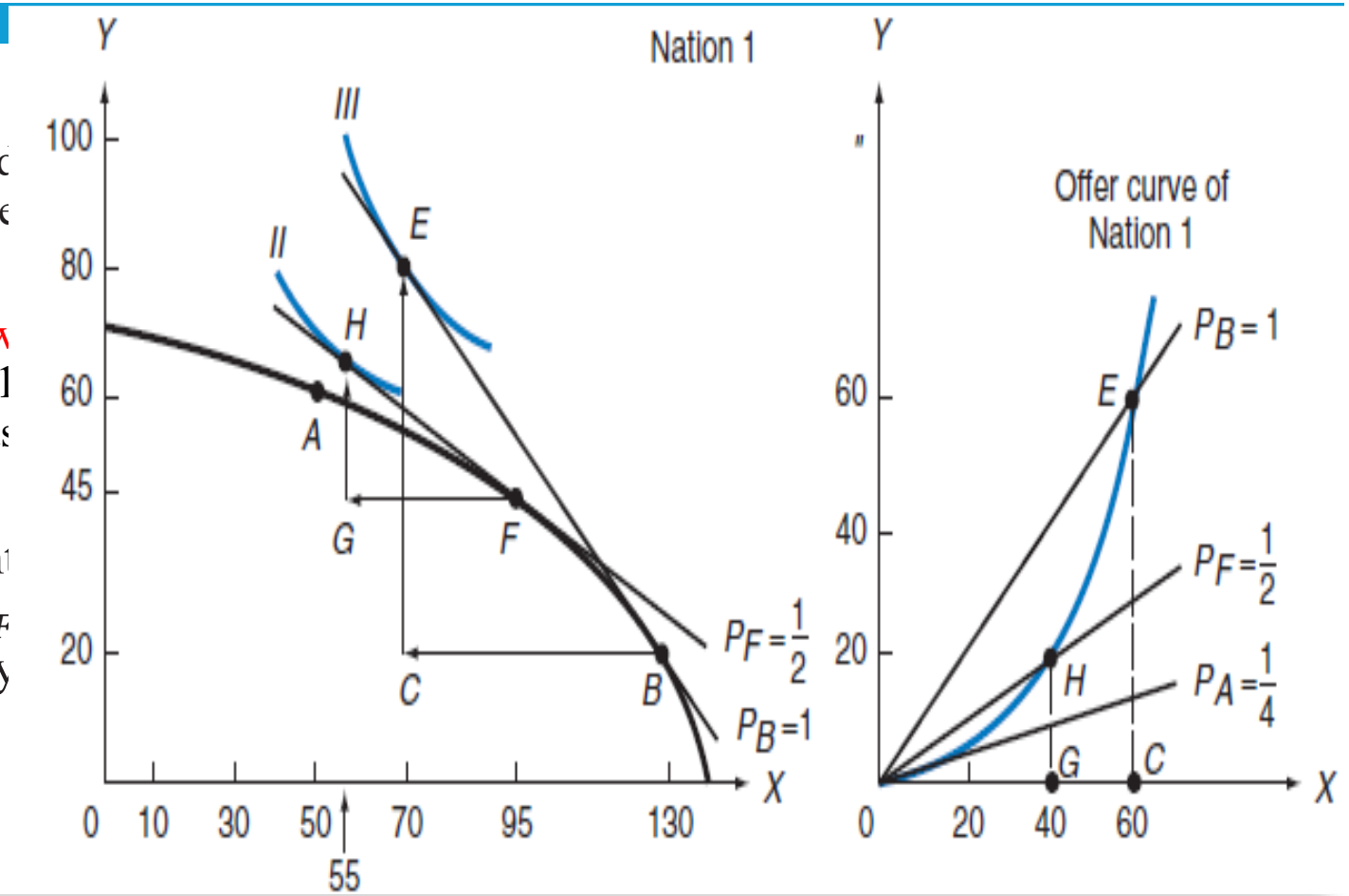
Offer curves – Derivation and Shape (Nation 1)

- Nation 1 starts at the no-trade (or autarky) point *A*,
- Case 1: If trade takes place at $\boldsymbol{P_B = P_X/P_Y = 1}$
- Nation 1 moves from A to point *B* in production, **trades 60X for 60Y** with Nation 2, and reaches **point *E*** on its indifference curve **III**
- Case 2: If trade take place at $\boldsymbol{P_F = P_X/P_Y = ½}$
- Nation 1 moves from A to point *F* in production, **trades 40X for 20Y** with Nation 2, and reaches **point *H*** on its indifference curve **II**



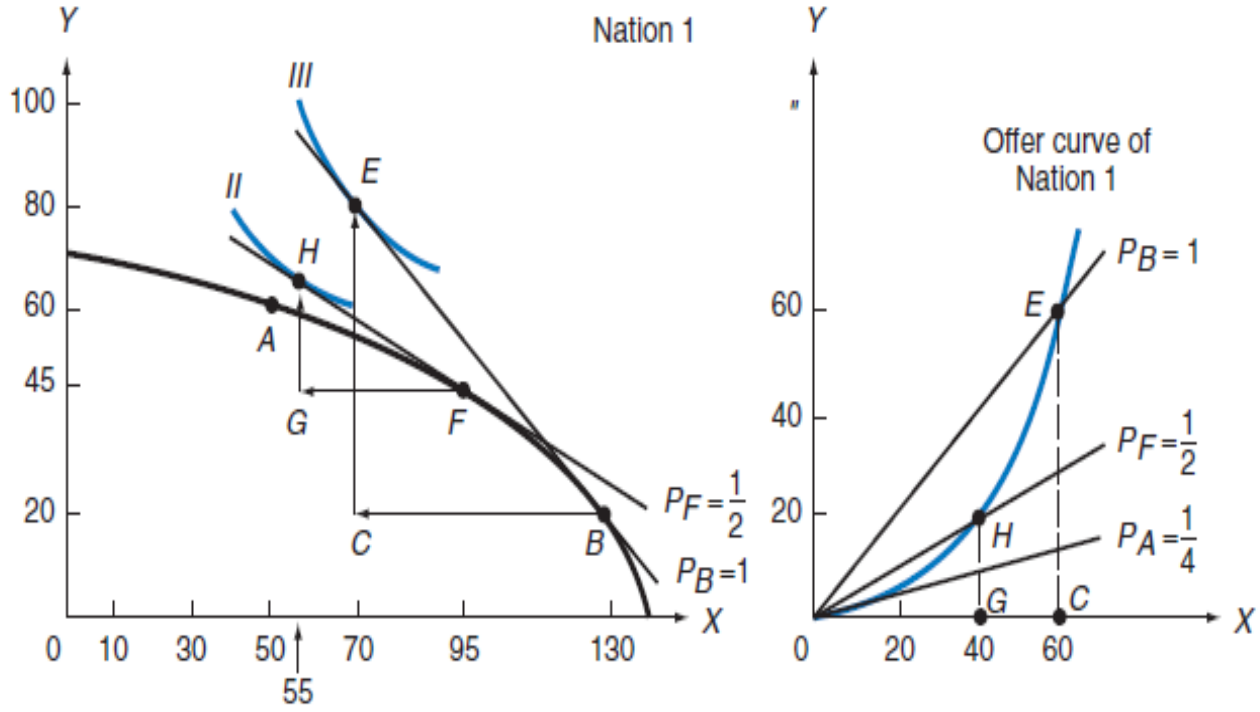
Offer curves – Derivation and Shape (Nation 1)

- Joining the origin with points H and E and other points similarly obtained, we generate Nation 1's offer curve in the right panel.
- The offer curve of Nation 1 shows how many imports of commodity Y Nation 1 requires to be willing to export various quantities of commodity X.
- Note that P_A, P_F , and P_B in the right panel refer to the same P_X/P_Y as P_A, P_F , and P_B in the left panel because they refer to the same *absolute* slope.



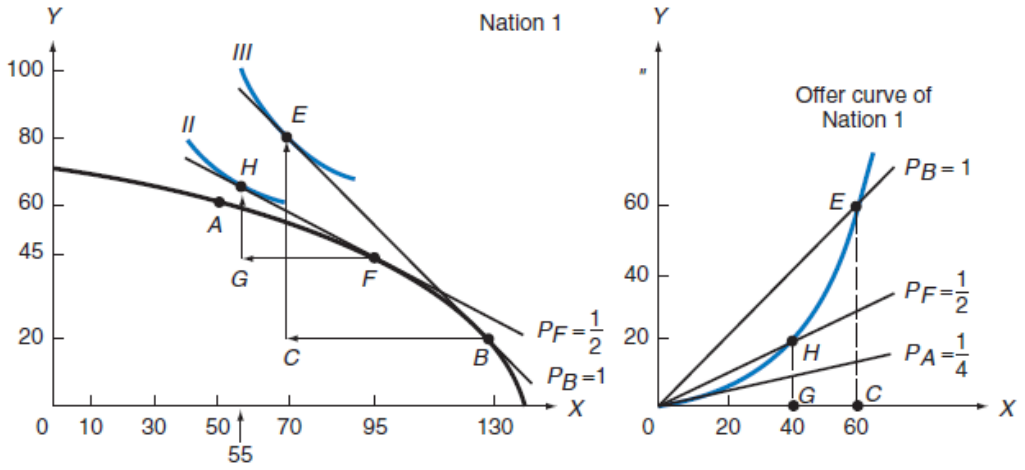
Offer curves – Derivation and Shape (Nation 1)

- The offer curve of Nation 1 in the right panel of the Figure **lies above** the **autarky price line** of $P_A = 1/4$ and bulges towards the X-axis, which measures the commodity of its comparative advantage and export.
- **To induce Nation 1 to export more of commodity X, P_X/P_Y must rise.**
- Thus, at $P_F = 1/2$, Nation 1 would export 40X, and at $P_B = 1$, it would export 60X.

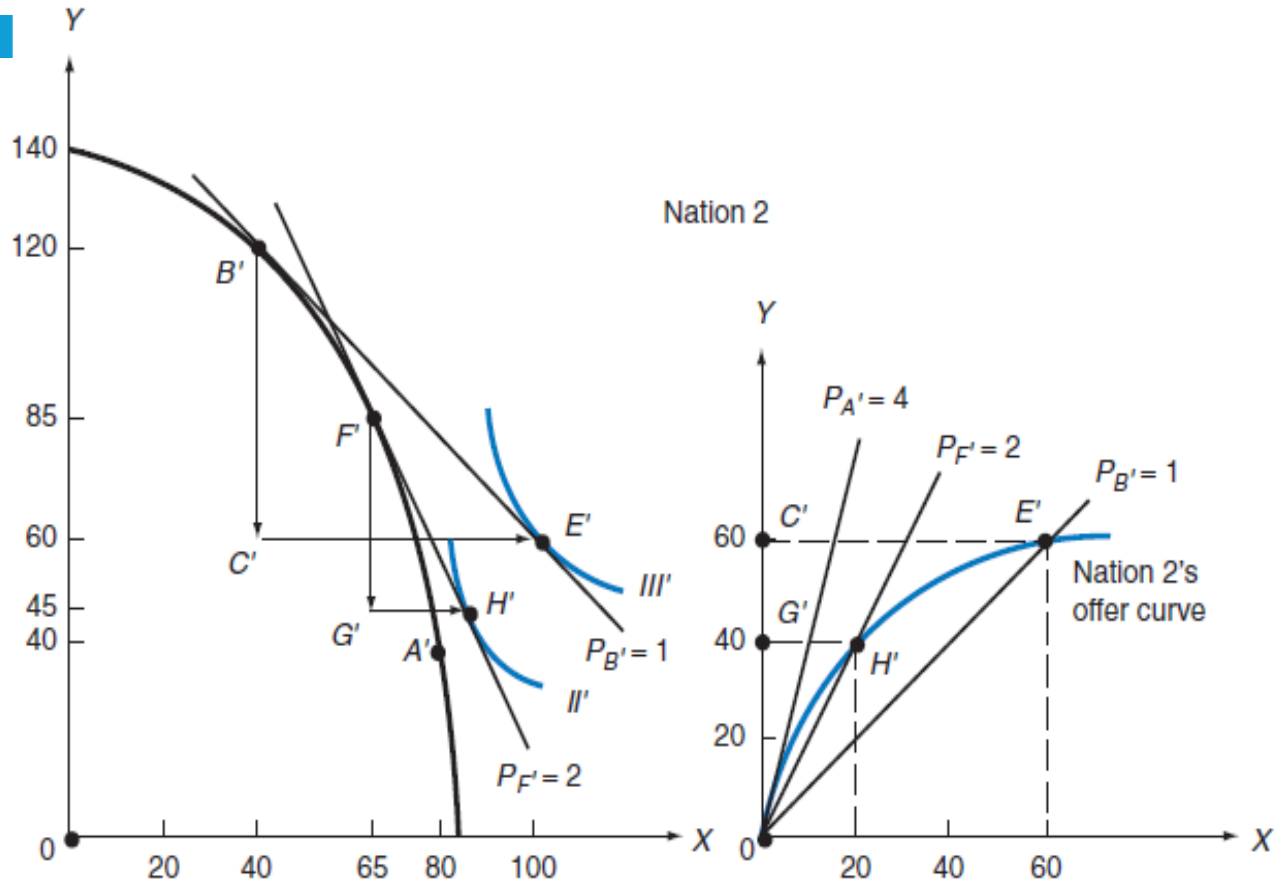


Offer curves – Derivation and Shape (Nation 1)

- **To induce Nation 1 to export more of commodity X, P_X/P_Y must rise.**
- There are two reasons for this:
- (1) Nation 1 incurs increasing opportunity costs in producing more of commodity X (for export), and
- (2) the more of commodity Y and the less of commodity X that Nation 1 consumes with trade, the more valuable to the nation is a unit of X at the margin compared with a unit of Y.

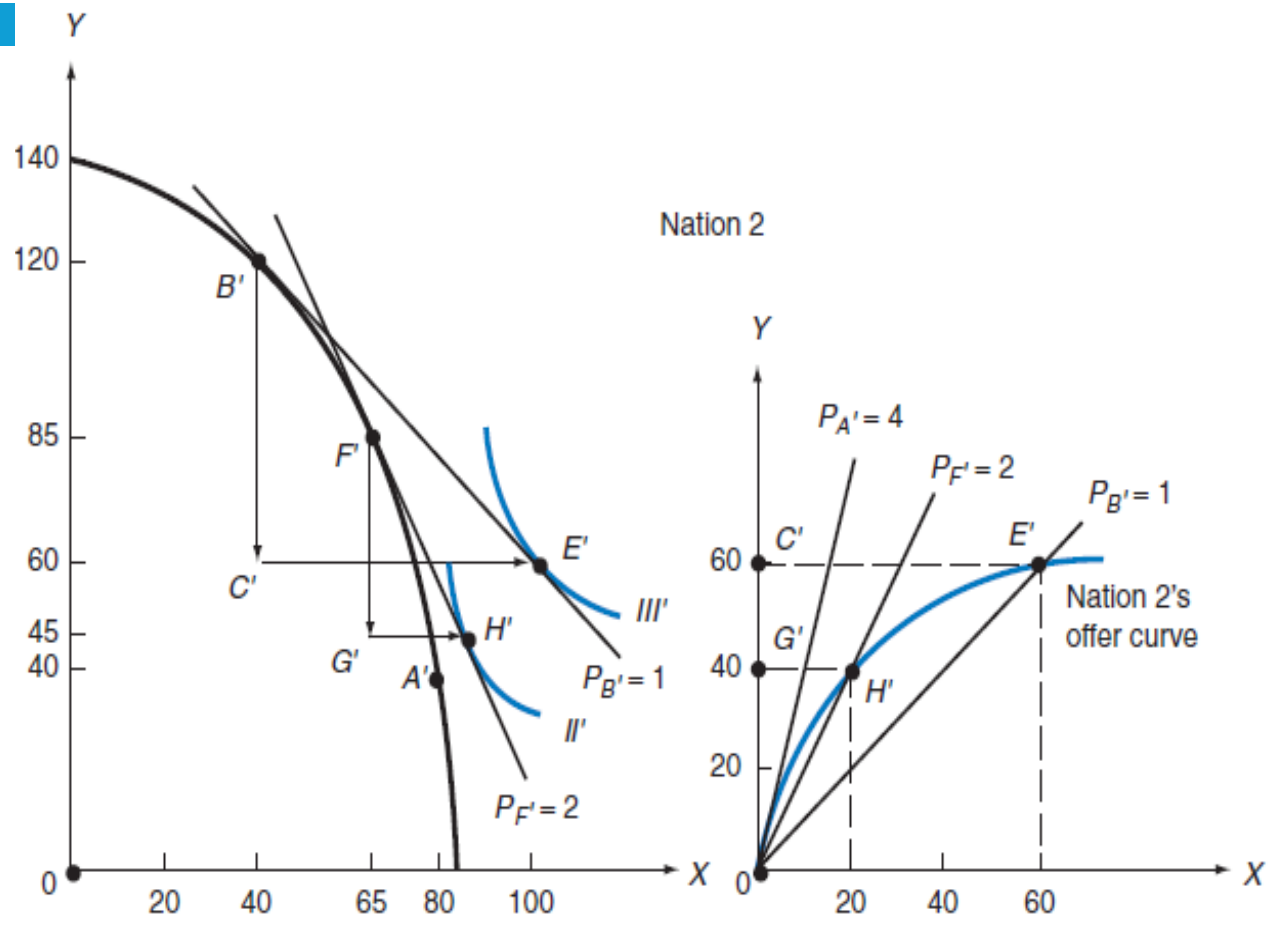


Offer curves – Derivation and Shape (Nation 2)



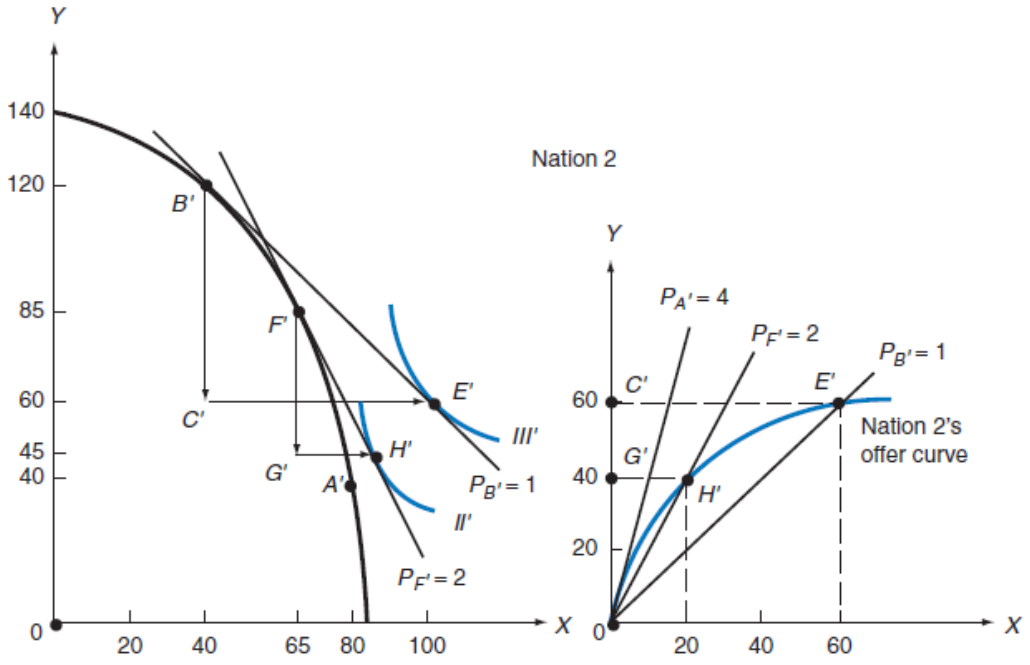
- In the left panel of the Figure , Nation 2 starts at the autarky equilibrium point ***A'*.**
- If trade takes place at $\boldsymbol{P_{B'} = P_X/P_Y = 1}$, Nation 2 moves to point *B* in production, exchanges 60Y for 60X with Nation 1, and reaches point ***E'*** on its indifference curve **III'**
- Trade triangle *B'C'E'* in the left panel of Fig corresponds to trade triangle *O'C'E'* in the right panel, and we get point *E'* on Nation 2's offer curve..

Offer curves – Derivation and Shape (Nation 2)



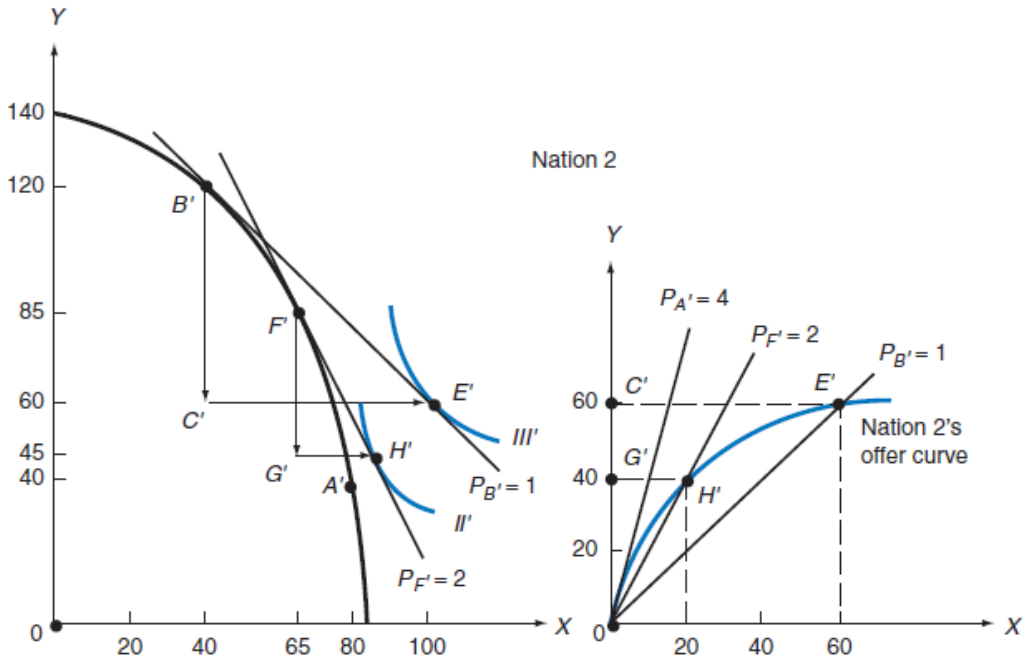
- At $\boldsymbol{P_{F'} = P_X/P_Y = 2}$ in the left panel, Nation 2 would move instead to point ***F'*** in production, exchange 40Y for 20X with Nation 1, and reach point *H'* on its indifference curve II'.
- Trade triangle *F'G'H'* in the left panel corresponds to trade triangle *O'G'H'* in the right panel, and we get point *H'* on Nation 2's offer curve.

Offer curves – Derivation and Shape (Nation 2)



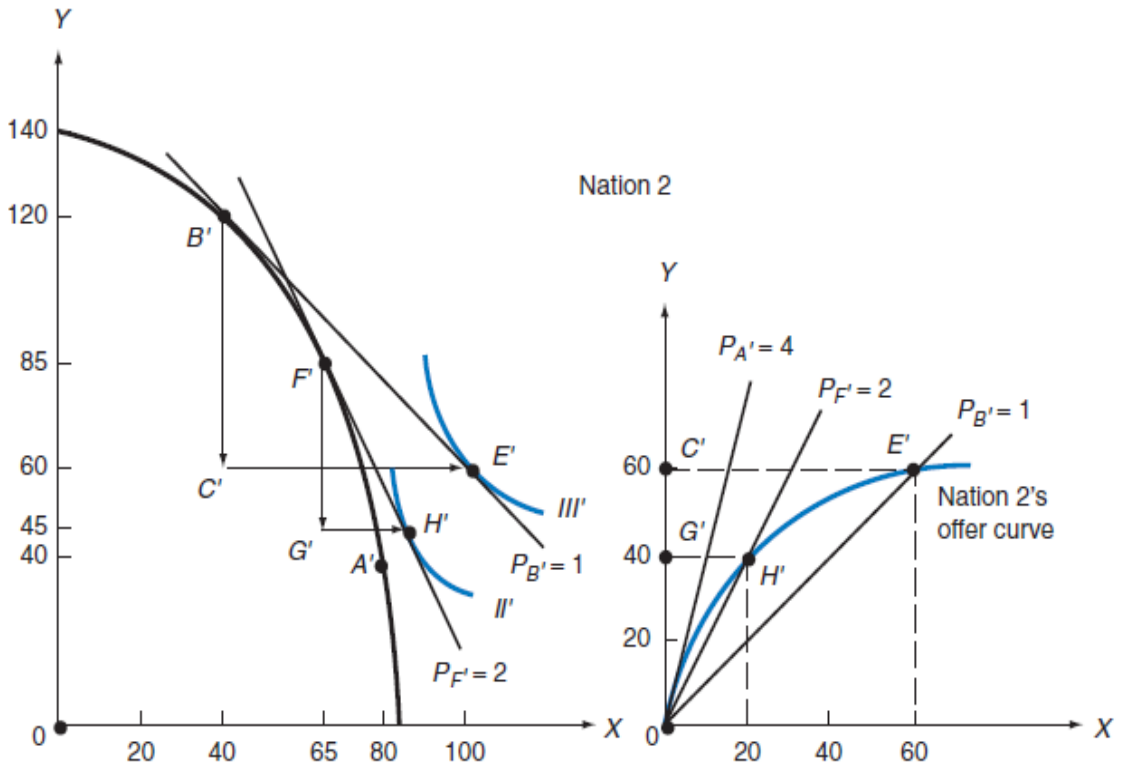
- Joining the origin with points *H'* and *E'* and other points similarly obtained, we generate Nation 2's offer curve in the right panel.
- **The offer curve of Nation 2 shows how many imports of commodity X Nation 2 demands to be willing to export various quantities of commodity Y.**
- Note that *PA'* , *PF'* , and *PB'* in the right panel refer to the same $\boldsymbol{P_X/P_Y}$ as *PA'* , *PF'* , and *PB'* in the left panel because they refer to the same *absolute* slope.

Offer curves – Derivation and Shape (Nation 2)



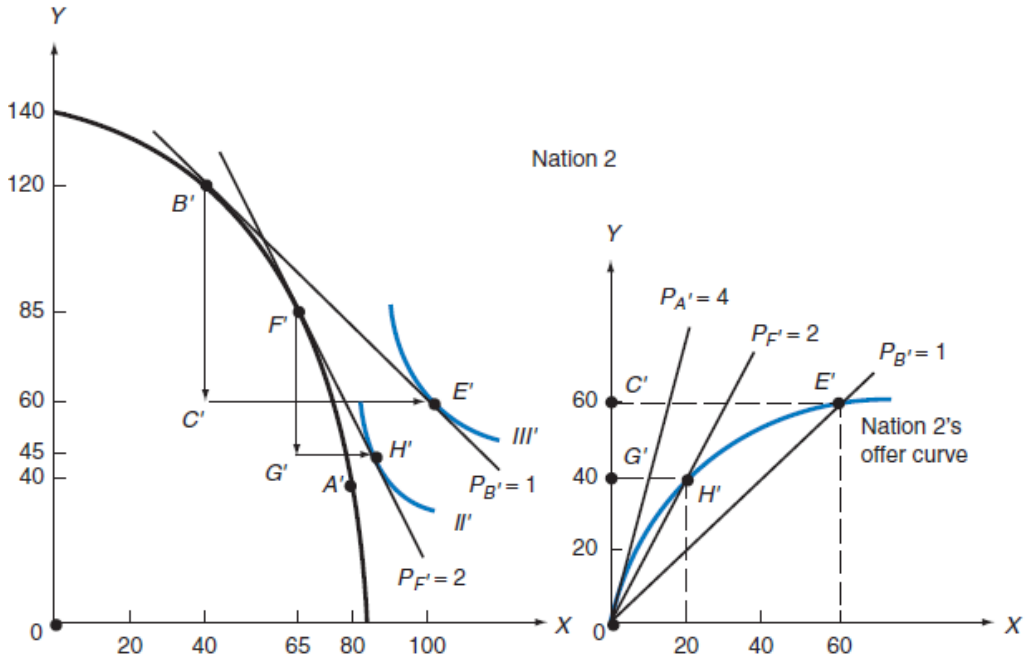
- The offer curve of Nation 2 in the right panel of Figure **lies *below*** its autarky price line of $\boldsymbol{P_{A'} = 4}$ and bulges toward the Y-axis, which measures the commodity of its comparative advantage and export.
- To induce Nation 2 to export more of commodity Y, the relative price of Y must rise.

Offer curves – Derivation and Shape (Nation 2)



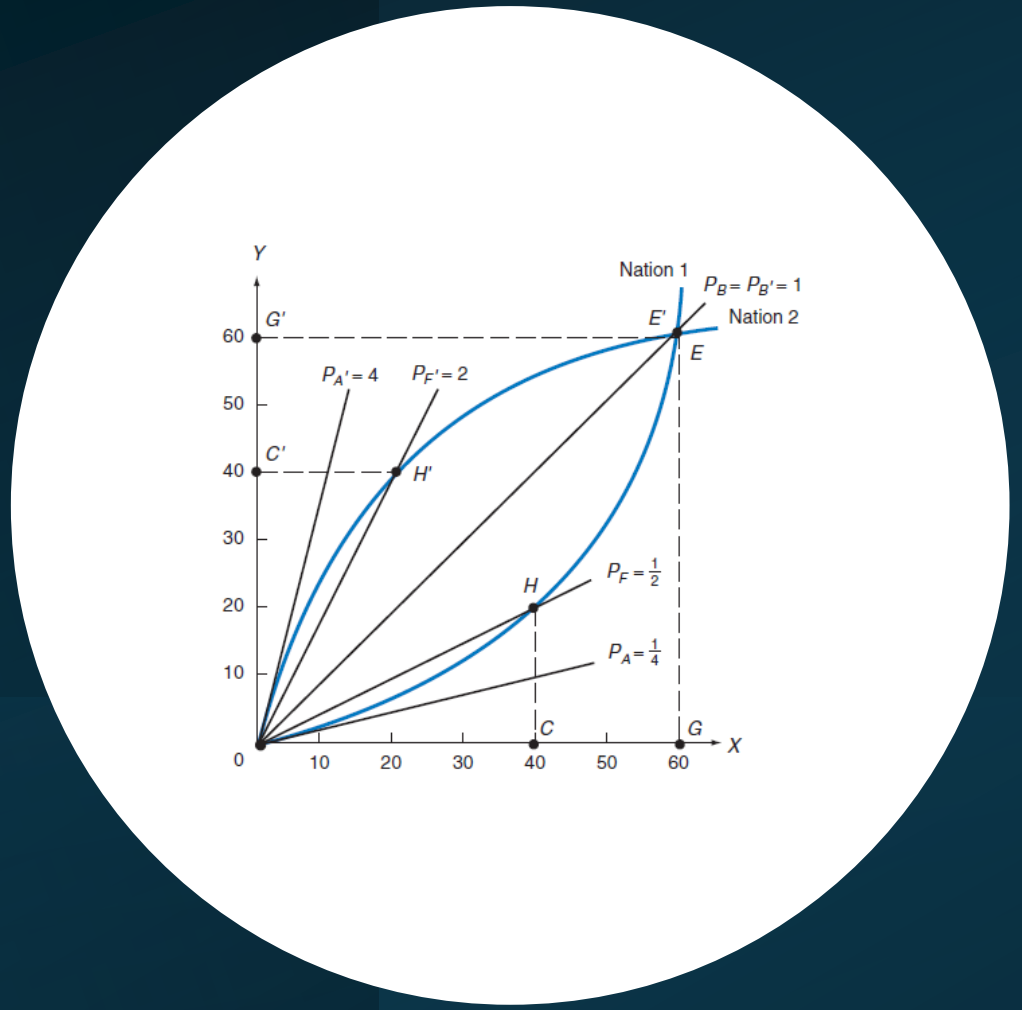
- **To induce Nation 2 to export more of commodity Y, the relative price of Y must rise.**
- This means that its reciprocal (i.e., $\boldsymbol{P_X/P_Y}$) must fall.
- Thus, at $\boldsymbol{P_{F'} = 2}$, Nation 2 would export 40Y, and at $\boldsymbol{P_{B'}}$ = 1, it would export 60Y.

Offer curves – Derivation and Shape (Nation 2)



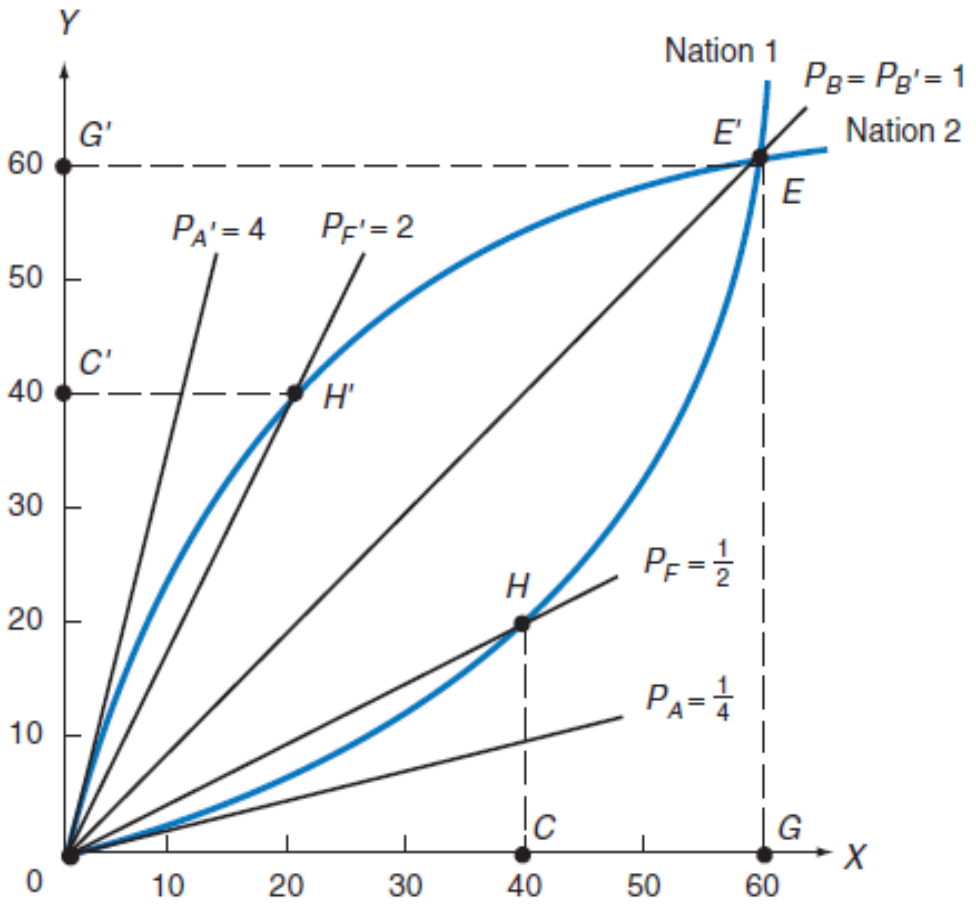
- Nation 2 requires a higher relative price of Y to be induced to export more of Y because
- (1) Nation 2 incurs increasing opportunity costs in producing more of commodity Y (for export), and
- (2) the more of commodity X and the less of commodity Y that Nation 2 consumes with trade, the more valuable to the nation is a unit of Y at the margin compared with a unit of X.

The Equilibrium-Relative Commodity Price with Trade—General Equilibrium Analysis



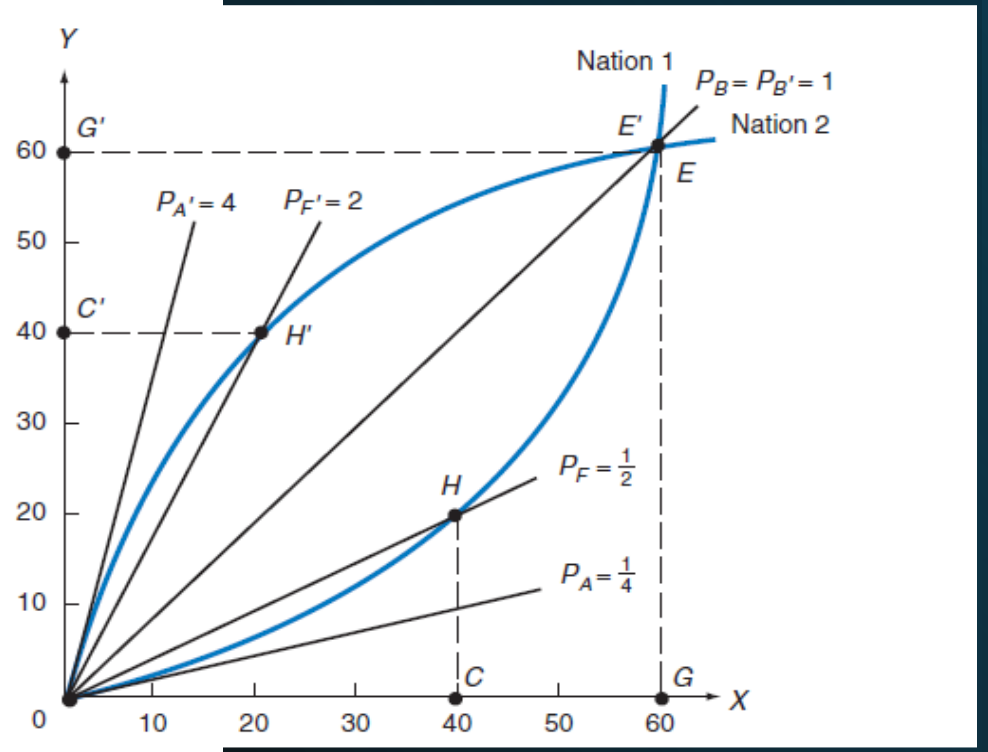
The Equilibrium-Relative Commodity Price with Trade—General Equilibrium Analysis

- The intersection of the offer curves of the two nations defines the equilibrium-relative commodity price at which trade takes place between them.
- Only at this equilibrium price will trade be balanced between the two nations.
- At any other relative commodity price, the *desired* quantities of imports and exports of the two commodities would not be equal.
- This would put pressure on the relative commodity price to move toward its equilibrium level.



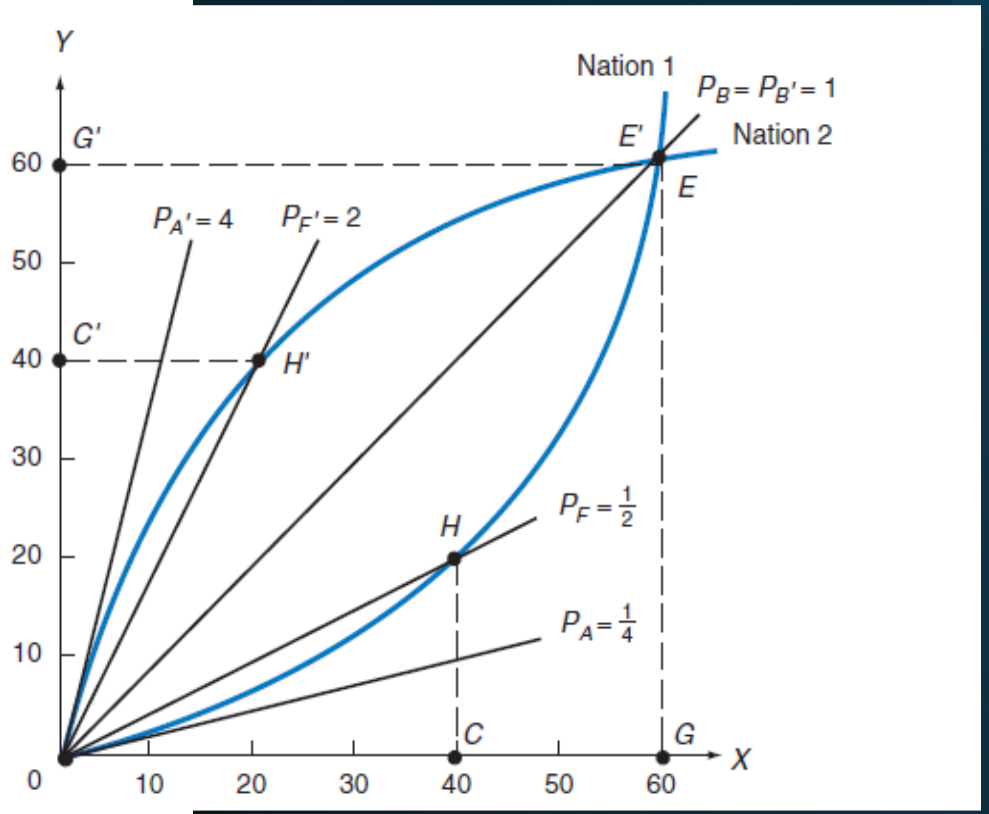
The Equilibrium-Relative Commodity Price with Trade—General Equilibrium Analysis

- The offer curves of Nation 1 and Nation 2 here are those derived in previous Figures.
- These two offer curves intersect at point *E*, defining equilibrium $\boldsymbol{P_X/P_Y = P_B = P_{B'}} = 1$.
- At $\boldsymbol{P_B}$, Nation 1 offers 60X for 60Y (point *E* on Nation 1's offer curve), and Nation 2 offers exactly 60Y for 60X (point *E'* on Nation 2's offer curve). Thus, trade is in equilibrium at $\boldsymbol{P_B}$.



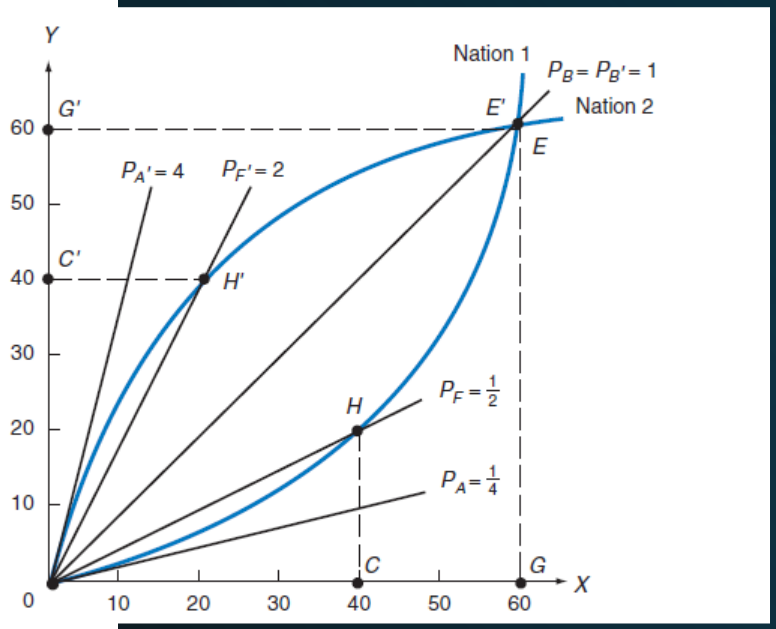
The Equilibrium-Relative Commodity Price with Trade—General Equilibrium Analysis

- At any other P_X/P_Y , trade would not be in equilibrium.
- For example, at P_F = 1/2, the 40X that Nation 1 would export (see point *H*) would fall short of the imports of commodity X demanded by Nation 2 at this relatively low price of X.



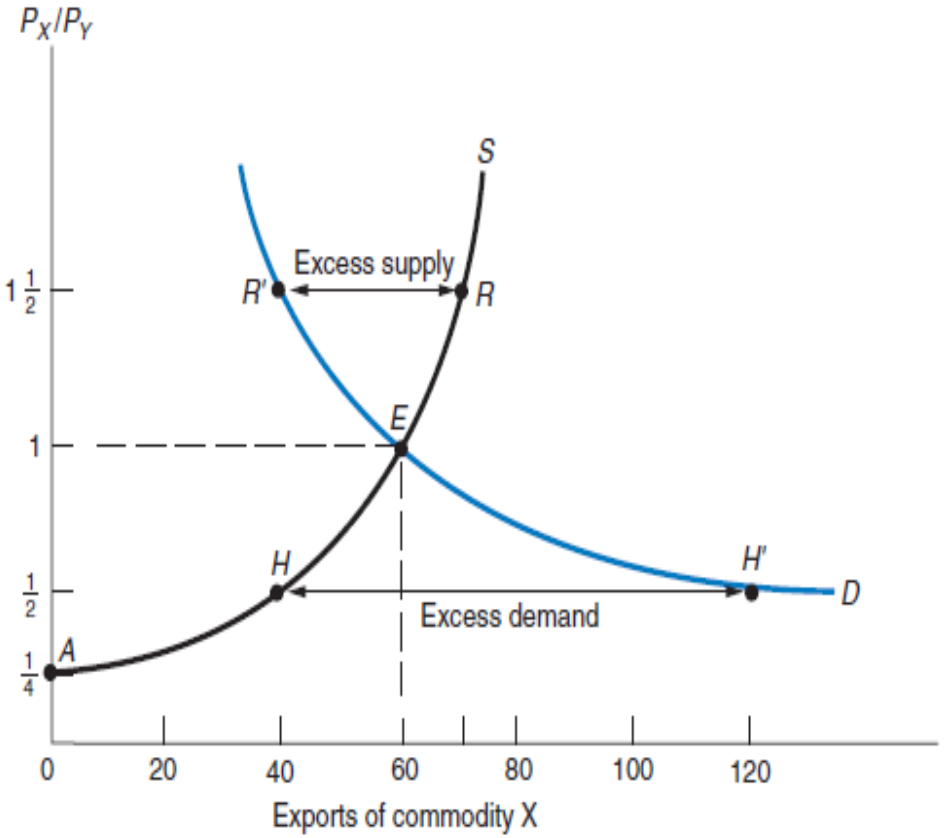
The Equilibrium-Relative Commodity Price with Trade—General Equilibrium Analysis

- The excess import demand for commodity X at $\boldsymbol{P_F}$ = 1/2 by Nation 2 tends to drive $\boldsymbol{P_X/P_Y}$ up.
- As this occurs, Nation 1 will supply more of commodity X for export (i.e., Nation 1 will move up its offer curve), while Nation 2 will reduce its import demand for commodity X (i.e., Nation 2 will move down its offer curve).
- This will continue until supply and demand become equal at $\boldsymbol{P_B}$.



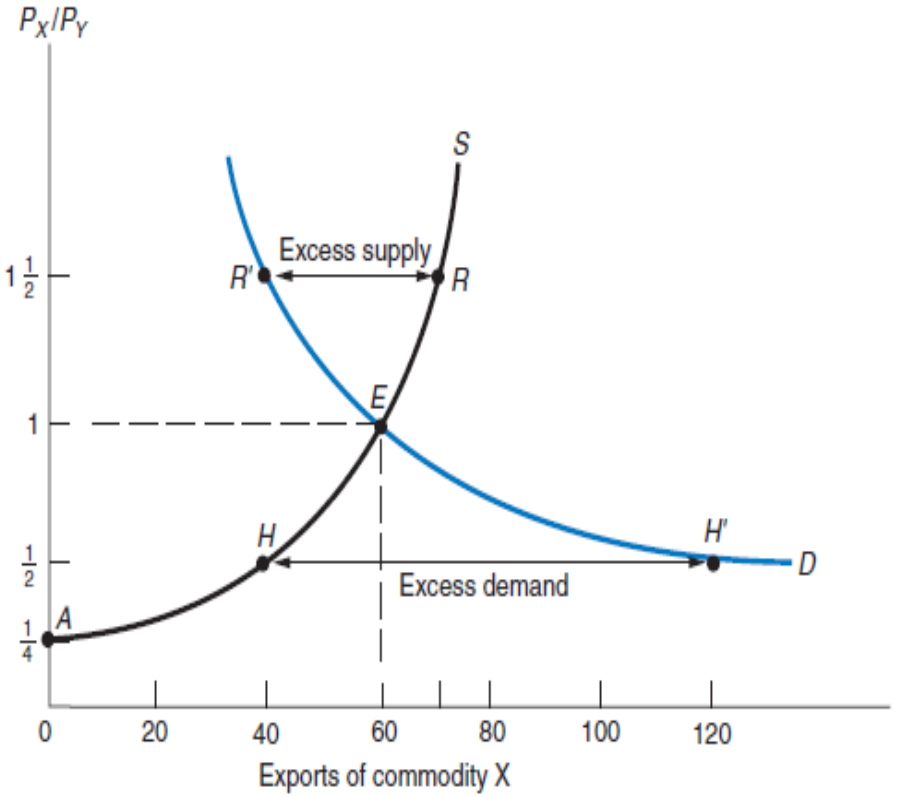
Partial Equilibrium

- Partial Equilibrium depicts how equilibrium is ensured in general equilibrium model
- In Figure , *S* is Nation 1's supply curve of exports of commodity X and is derived from Nation 1's production frontier and indifference map.
- Specifically, *S* shows that the quantity supplied of exports of commodity X by Nation 1 is zero (point *A*) at $\boldsymbol{P_X/P_Y}$ = 1/4, 40 (point *H*) at $\boldsymbol{P_X/P_Y}$ = 1/2, and 60 (point *E*) at $\boldsymbol{P_X/P_Y}$ = 1 . The export of 70X by Nation 1 at $\boldsymbol{P_X/P_Y}$ =$\mathbf{1\frac{1}{2}}$ (point *R* on the *S* curve)



Relationship between General and Partial Equilibrium

- On the other hand, *D* refers to Nation 2's demand for Nation 1's exports of commodity X and is derived from Nation 2's production frontier and indifference map .
- Specifically, *D* shows that the quantity demanded of Nation 1's exports of commodity X by Nation 2 is 60 (point *E*) at $\boldsymbol{P_X/P_Y}$ = 1; 120 (point *H*) at $\boldsymbol{P_X/P_Y}$ = 1/2, but 40 (point *R*) at $\boldsymbol{P_X/P_Y} = \mathbf{1\frac{1}{2}}$
- *D* and *S* intersect at point *E* in Figure determining the equilibrium $\boldsymbol{P_X/P_Y}$ = 1 and the equilibrium quantity of exports of 60X



Relationship between General and Partial Equilibrium

- At R ($\boldsymbol{P_X/P_Y = 1\frac{1}{2}}$) there **is excess supply** of exports (R'R=30X) and **relative price fall** towards equilibrium
- At $\boldsymbol{P_X/P_Y}$ = 1/2, there is an **excess demand** of exports of *HH* = 80X, and $\boldsymbol{P_X/P_Y}$ **rises** toward equilibrium (here $\boldsymbol{P_X/P_Y}$ = 1)