

- e. Graph world relative demand for coffee to wine $RD = P_w/P_c$.

- f. Find the equilibrium relative price of coffee to wine under free trade.

- g. Compare the free trade relative price to each country's autarky relative price.

- h. Determine each country's optimal production bundle under free trade.

REVIEW 3.1 SOLUTION (COLUMBIAN PPF)

In Columbia, producing one pound of coffee requires 1 unit of labor, while producing one bottle of wine requires 4 units of labor. In France, producing one pound of coffee requires 2 units of labor, while producing one bottle of wine requires 1 unit of labor.

- a. Construct the Columbian production possibilities frontier for labor supply $L = 240$.

$$a_{LC}Q_C + a_{LW}Q_W = L \rightarrow Q_C + 4Q_W = 240$$

$$\rightarrow Q_W = 60 - \frac{1}{4}Q_C$$

- b. Determine the maximum Columbian coffee production.

$$\bar{Q}_C = 240$$

- c. Determine the maximum Columbian wine production.

$$\bar{Q}_W = 60$$

- d. Find Columbia's opportunity cost of coffee in terms of wine.

$$\frac{a_{LC}}{a_{LW}} = \frac{1}{4}$$

REVIEW 3.2 SOLUTION (FRENCH PPF)

- a. Construct the French production possibilities frontier for labor supply $L^* = 120$.

$$a_{LC}^* Q_C^* + a_{LW}^* Q_W^* = L^* \rightarrow 2Q_C^* + Q_W^* = 120$$

$$\rightarrow Q_W^* = 120 - 2Q_C^*$$

- b. Determine the maximum French coffee production.

$$\bar{Q}_C^* = 60$$

- c. Determine the maximum French wine production.

$$\bar{Q}_W^* = 120$$

- d. Find France's opportunity cost of coffee in terms of wine.

$$\frac{a_{LC}^*}{a_{LW}^*} = \frac{2}{1} = 2$$

- e. Compare the slopes of the Columbian and French PPFs. Which is steeper and why?

The slope of the French PPF (-2) is steeper than the slope of the Columbian PPF (-1/4), as France has a larger opportunity cost of coffee in terms of wine than Columbia.

REVIEW 3.3 SOLUTION (WORLD EQUILIBRIUM)

- a. What relative price of coffee to wine is required to have Columbia produce both coffee and wine?

$$\left(\frac{P_C}{P_W} \right)^A = \frac{a_{LC}}{a_{LW}} = \frac{1}{4}$$

- b. What relative price of coffee to wine is required to have France produce both coffee and wine?

$$\left(\frac{P_C}{P_W} \right)^{A^*} = \frac{a_{LC}^*}{a_{LW}^*} = 2$$

- c. What is the World relative supply of coffee to wine if both countries specialize in their comparative advantage good?

$$\tilde{RS} = \frac{\bar{Q}_C}{\bar{Q}_W^*} = \frac{240}{120} = 2$$

- d. Construct world relative supply.

$$RS = \begin{cases} 0 \dots 2 & P_C/P_W = 1/4 \\ 2 \dots \infty & P_C/P_W = 2 \end{cases}$$

- e. Graph world relative demand for coffee to wine $RD = P_W/P_C$.

P_C/P_W	$RD = P_W/P_C$	RS
1/4	4	0 ... 2
1/2	2	2
2	1/2	2 ... ∞

- f. Find the equilibrium relative price of coffee to wine under free trade.

$$2 = \tilde{RS} = RD = P_W/P_C \rightarrow P_C/P_W = 1/2$$

- g. Compare the free trade relative price to each country's autarky relative price.

The free trade relative price of coffee to wine of 1/2 is higher than the Columbian autarky price of 1/4 and lower than the French autarky price of 2.

- h. Determine each country's optimal production bundle under free trade.

Columbia specializes in coffee and France specializes in wine.

$$Q_C = \bar{Q}_C = 240, Q_W = 0$$

$$Q_C^* = 0, Q_W^* = \bar{Q}_W^* = 120$$

REVIEW 3-4a SOLUTION (COLUMBIAN TPF)

- a. Construct Columbia's trade possibilities frontier.

$$\frac{P_C}{P_W} D_C + D_W = \frac{P_C}{P_W} \bar{Q}_C \rightarrow \frac{1}{2} D_C + D_W = 120$$

$$\rightarrow D_W = 120 - \frac{1}{2} D_C$$

- b. Determine the maximum Columbian coffee consumption.

$$\bar{D}_C = 240$$

- c. Determine the maximum Columbian wine consumption.

$$\bar{D}_W = 120$$

- d. What is the slope of Columbia's TPF?

The (negative of the) free trade relative price of coffee.

REVIEW 3-4b SOLUTION (FRENCH TPF)

- e. Construct France's trade possibilities frontier.

$$\frac{P_C}{P_W} D_C^* + D_W^* = \bar{Q}_W^* \rightarrow \frac{1}{2} D_C^* + D_W^* = 120$$

$$D_W^* = 120 - \frac{1}{2} D_C^*$$

- f. Determine the maximum French coffee consumption.

$$\bar{D}_C^* = 240$$

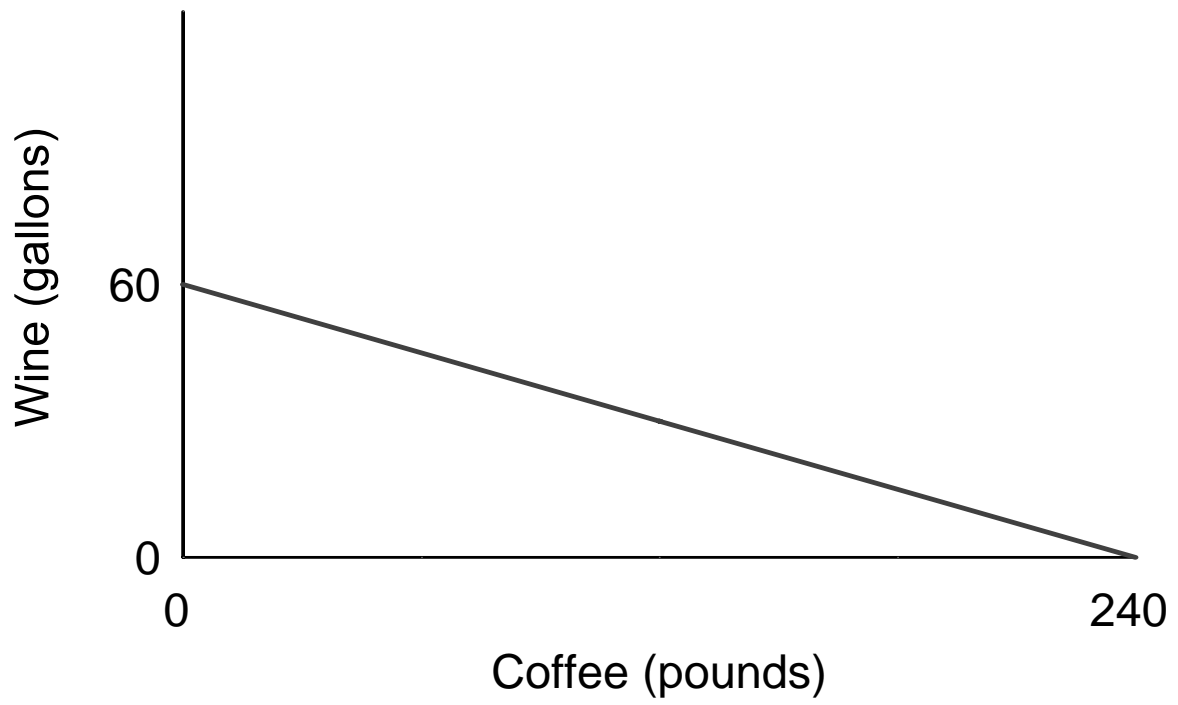
- g. Determine the maximum French wine consumption.

$$\bar{D}_W^* = 120$$

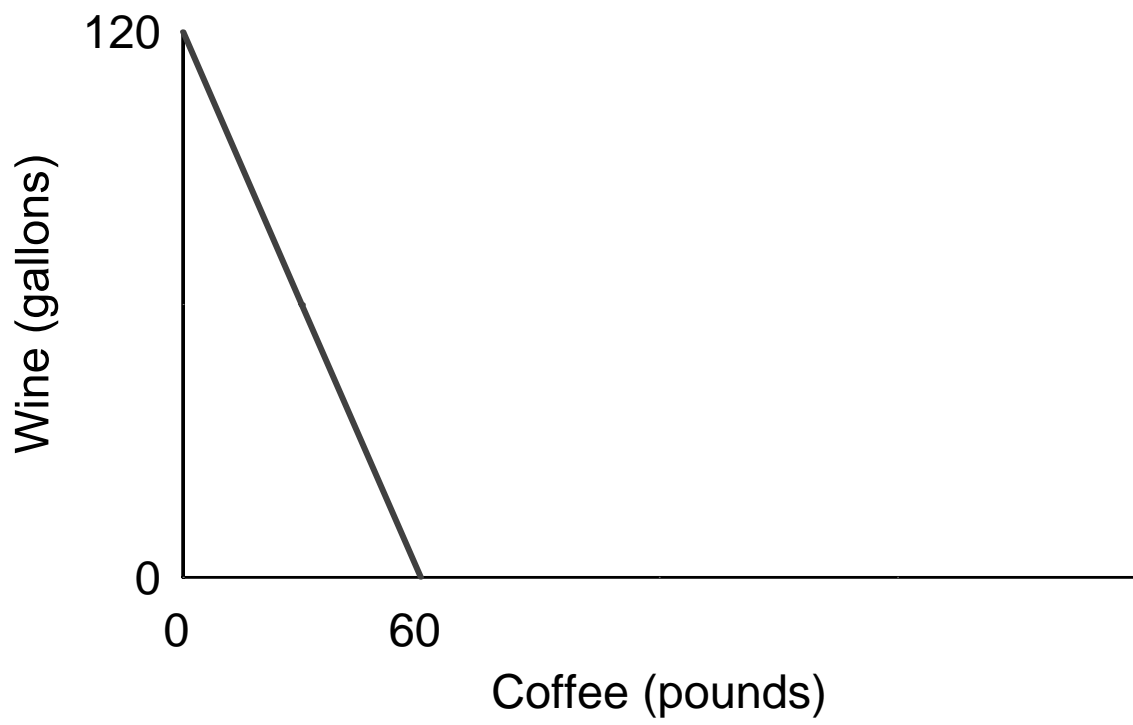
- h. Compare the slopes of the Columbian and French TPFs and explain.

The two slopes are the same as the countries both face the same free trade relative price of coffee in terms of wine.

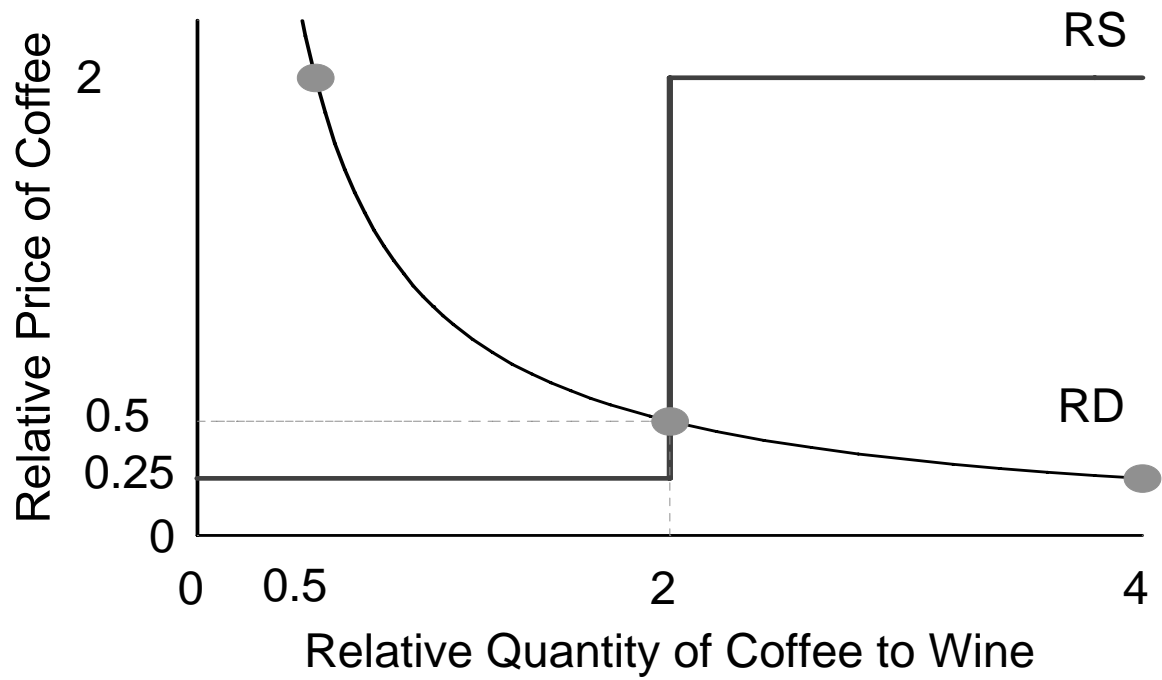
Review 3.1 Columbian PPF



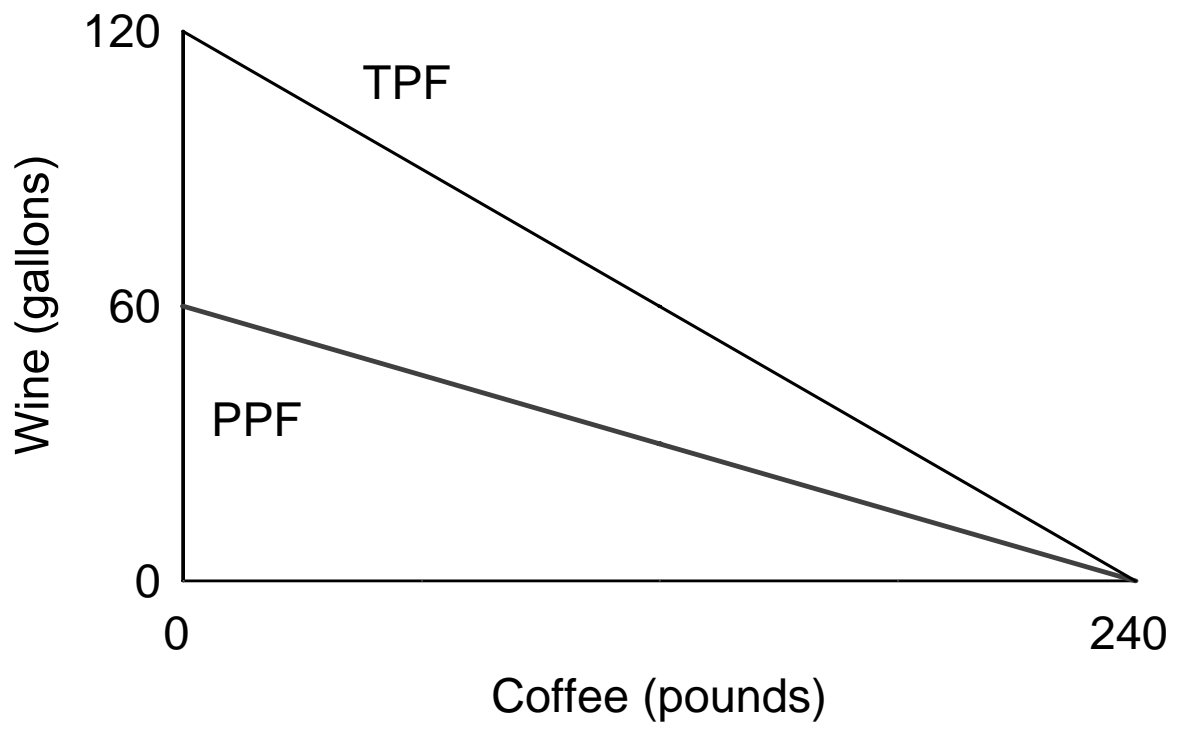
Review 3.2 French PPF



Review 3.3 World RS & RD



Review 3.4 Columbian TPF



Review 3.4* French TPF

