Model Summary

1. Ricardo – 2 goods, 1 input (labor), constant returns to scale

PPF endpoints given by the labor force, \( L \), divided by the corresponding labor-output coefficient. Relative price depends on ratio of factor input requirements:

\[
\frac{P_c}{P_F} = \frac{a_{LC}}{a_{LF}},
\]

which is assumed to be constant. The less labor it takes to produce a unit of food (small \( a_{LF} \)) the higher will be the relative price of clothing. Although relative productivities determine prices and the pattern of trade, absolute productivity determines the wage or standard of living in a country.

Double inputs and the value of each point along the PPF doubles. Increase the price of the export good and the entire country gains.

2. Specific factors model – 2 goods, 3 factor inputs, constant returns to scale

Clothing requires labor (L) and capital (K)
Food requires labor (L) and land (N)

Derive the PPF in the NE quadrant from the production functions for clothing and food and the supply of labor, which is mobile across sectors. Note the endpoint of the PPF occurs where all the available labor is used in a given industry.

The PPF reflects declining Marginal Product of Labor in each sector when more \( L \) is added to a fixed amount of \( K \) or \( N \). Use this framework to show:

\( \uparrow L \) (shift out the 45° line in the SW quadrant) \( \rightarrow \) produce more of both goods at constant price
\( \uparrow K \) (shift out the production function for clothing) \( \rightarrow \) produce more clothing and less food at constant price
\( \uparrow N \) (shift out the production function for food) \( \rightarrow \) produce more food and less clothing at constant price.

Even if prices stay the same how are factor rewards affected? (Use the diagram above or below).

\( \uparrow L \) results in \( \uparrow MPL \), real wage rate falls, returns to \( K \) and \( N \)
\( \uparrow K \) or \( \uparrow N \) results in \( \uparrow MPL \), real wage rate rises, rate of returns to both \( K \) and \( N \) falls

Demonstration of the effect of \( \uparrow P_c \) on income distribution.
Capitalist gains a-c. Why is this always positive? Recognize \( r = P \cdot MPK \) and note both terms rise. Landowner loses e + f. Labor gains c + d + e + f. But, has labor’s real income risen? \( W = P \cdot MPL \), the price rises, but the MPL falls in clothing production, so the wage rises by less than the price of clothing. If labor spends a lot of its income on clothing, it becomes worse off.

3. **Heckscher-Ohlin** 2 goods – 2 factors, constant returns to scale

Clothing is labor-intensive. Food is capital intensive. A country will export the good that uses intensively the factor in which it is relatively abundant.

Show the effect of an increase in the labor supply, with prices constant, is to increase clothing output and decrease food output. Note producers will continue to use same K/L ratios before and after the change, returns to K and L remain unchanged.

If the price of clothing rises, output of clothing rises. Show that this causes wages to rise and returns to capital to fall in real terms. Note what happens to K/L used in each sector.