ECON3510 Tutorial 6 Answers - See Claudio's Answer Guide for Text/Missing Sections

2019

Exercise 1

1.1 Question 3

Before Growth

Since $\frac{P_c^w}{P_f^w} = 1$ we have from out optimal production formula:

$$1 = \frac{P_c^w}{P_f^w} = f_{OC}(\frac{Q_C}{Q_F}) = \frac{Q_C^2}{Q_F^2}$$

$$\therefore Q_C^2 = Q_F^2$$

Substituting $Q_C^2 = Q_F^2$ into our PPF yields:

$$Q_C^2 + Q_F^2 = 100$$

$$Q_F^2 + Q_F^2 = 100$$

$$2Q_F^2 = 100$$

$$\therefore Q_F = 5\sqrt{2}$$

$$\therefore Q_C = 5\sqrt{2}$$

After Growth: Since $\alpha = 1/3$ and $\beta = 2/3$ we have that from optimality in the production formula

that:

$$1 = \frac{P_c^w}{P_f^w} = f_{OC}(\frac{Q_C}{Q_F}) = \frac{\beta Q_C}{\alpha Q_F}$$

$$\therefore \alpha Q_F = \beta Q_C$$

$$\frac{Q_C}{Q_F} = \frac{\alpha}{\beta} = 0.5$$

$$Q_C = 0.5 Q_F$$

$$\therefore Q_C^2 = 0.25 Q_F^2$$

Substituting $Q_C^2 = 0.25 Q_F^2$ into the new PPF we get the following:

$$\beta Q_C^2 + \alpha Q_F^2 = 100$$

$$0.25\beta Q_F^2 + \alpha Q_F^2 = 100$$

$$\frac{1}{6} Q_F^2 + \frac{1}{3} Q_F^2 = 100$$

$$0.5 Q_F^2 = 100$$

$$\therefore Q_F = 10\sqrt{2}$$

Substituting $\alpha Q_F^2 = 4\beta Q_C^2$ into our new PPF:

$$\beta Q_C^2 + \alpha Q_F^2 = 100$$

$$\beta Q_C^2 + 4\alpha Q_C^2 = 100$$

$$\frac{2}{3} Q_C^2 + \frac{4}{3} Q_C^2 = 100$$

$$2 Q_C^2 = 100$$

$$\therefore Q_C = 5\sqrt{2}$$

Exercise 2

2.1 Question 1

Home We have that the supply of cloth is $Q_C^S = 100 - 20\frac{P_F}{P_C}$ and the supply of food is $Q_F^s = 100\frac{P_f}{P_C}$

Relative supply is:

$$RS = \frac{Q_C^S}{Q_F^S}$$
$$RS = \frac{100 - 20\frac{P_F}{P_C}}{100\frac{P_F}{P_C}}$$
$$RS = \frac{100}{100\frac{P_F}{P_C}} - \frac{20\frac{P_F}{P_C}}{100\frac{P_F}{P_C}}$$
$$\therefore RS = \frac{P_C}{P_F} - \frac{1}{5}$$

Foreign We have that $Q_C^S = 100 - 20\frac{P_F}{P_C}$ and $Q_F^S = 25\frac{P_F}{P_C}$

Relative Supply is:

$$RS = \frac{Q_C^s}{Q_F^s}$$
$$RS = \frac{100 - 20\frac{P_F}{P_C}}{25\frac{P_F}{P_C}}$$
$$\therefore RS^* = 4\frac{P_C}{P_F} - 4/5$$

2.2 Question 2

Home

$$RS = RD$$
$$\frac{P_C}{P_F} - \frac{1}{5} = 1.8 - \frac{P_C}{P_F}$$
$$2\frac{P_C}{P_F} = 2$$
$$\therefore \frac{P_C}{P_F} = 1$$

Foreign

$$RS^* = RD^*$$
$$4\frac{P_C}{P_F} - 4/5 = 1.8 - \frac{P_C}{P_F}$$
$$5\frac{P_C}{P_F} = 2.6$$
$$\therefore \frac{P_C}{P_F} = 0.52$$

2.3 Question 3

(1) we must compute real supply for cloth and food to find relative supply:

$$RS_C^W = Q_C + Q_C^*$$
$$RS_C^W = 100 - 20\frac{P_F}{P_C} + 100 - 20\frac{P_F}{P_C}$$
$$\therefore RS_C^W = 200 - 40\frac{P_F}{P_C}$$
$$RS_F^W = Q_F + Q_F^*$$
$$RS_F^W = 100\frac{P_F}{P_C} + 25\frac{P_F}{P_C}$$
$$\therefore RS_F^W = 125\frac{P_F}{P_C}$$

From our world relative supply formula we have:

$$RS^W = \frac{RS_C^w}{RS_F^w}$$
$$RS^W = \frac{200 - 40\frac{P_F}{P_C}}{125\frac{P^F}{P_C}}$$
$$\therefore RS^W = \frac{8P_C}{5P_F} - \frac{8}{25}$$

(2) we would usually compute real demand for cloth and food to find the relative demand, however we are already given relative demand in the question:

$$RD^W = 1.8 - \frac{P_C}{P_F}$$

(3) set $RD^W = RS^W$

$$RD^W = 1.8 - \frac{P_C}{P_F} = \frac{8P_C}{5P_F} = RS^W$$

$$1.8 + 8/25 = \frac{8P_C}{5P_F} + \frac{P_C}{P_F}$$

$$\therefore 2.12 = \frac{13}{5}\frac{P_C}{P_F}$$

$$\frac{P_C}{P_F} = \frac{2.12}{(\frac{13}{5})}$$

$$\therefore P_C/P_F = 53/65$$