Trade stability in General Equillibrium Framework:

[Recap: For stability in Partial Equi Framework: $\frac{dED}{dP} < 0$].

Consider good X:

HW.

For stability we should have: $\frac{dED_X}{dp} < 0$, [where $p = \frac{P_X}{P_Y}$]

$$ED_X = M^* - X.$$

[& Given: $\frac{M}{X} = p \Rightarrow X = \frac{M}{p}$]

$$ED_X = M^* - \frac{M}{p}.$$

$$\frac{dED_X}{dp} = \frac{dM^*}{dp} - \frac{p \cdot \frac{dM}{dp} - M}{p^2} = \frac{dM^*}{dp} - \frac{1}{p} \cdot \frac{dM}{dp} + \frac{M}{p^2}$$

For trade stability: $\frac{dED_X}{dp} < 0$

$$\Rightarrow \frac{dM^*}{dp} - \frac{1}{p} \cdot \frac{dM}{dp} + \frac{M}{p^2} < 0.$$

$$\Rightarrow \left(\frac{-p \, dM^*}{M^* \, dp} \right) + \frac{1}{\cancel{p}} \cdot \frac{\cancel{p} \, dM}{M^* \, dp} - \frac{M}{p^2} \cdot \frac{p}{M^*} > 0.$$

$$\Rightarrow \epsilon^* + \frac{1}{M^*} \cdot \frac{dM}{dp} - \frac{M}{M^*} \cdot \frac{1}{p} > 0$$

$$\Rightarrow \epsilon^* + \frac{1}{X} \cdot \frac{dM}{dp} - \frac{M}{X} \cdot \frac{1}{p} > 0$$

$$\Rightarrow \epsilon^* + \left(\frac{dM}{dp} \cdot \frac{p}{M} \right) - \frac{\cancel{M}}{\cancel{p}} \cdot \frac{\cancel{p}}{\cancel{M}} > 0$$

$$\Rightarrow \epsilon^* + \epsilon - 1 > 0$$

$$\epsilon = \frac{dM}{dp} \cdot \frac{p}{M}$$

$$\epsilon^* = -\frac{dM^*}{dp} \cdot \frac{p}{M^*}$$

$X = M^*$

$M = X^*$

For Home:

$$\frac{M}{X} = p.$$

$$X = \frac{M}{p}.$$

$$\Rightarrow \quad \epsilon^* + \epsilon - 1 > 0$$

$$\text{or,} \quad \boxed{\epsilon + \epsilon^* > 1} \Rightarrow$$ Marshall-Learner (ML) Conditions

For ensuring, int. relative price $p = \frac{P_X^*}{P_Y^*}$ is stable, above condition should be satisfied.

Theory of International Trade

(i) Trade occurs because Autarky prices differs.

(ii) Why does Autarky prices differs?

2 possibilities:

↳ Supply conditions differ b/w H & F (Assume DD remains same) [International Trade]

↳ Demand conditions differ b/w H & F (Assume SS remains same)

↳ [Open Eco Macroeconomics]

Supply conditions differ b/w H & F: [$q = f(L, K)$].

↳ Technological Differences in prodn b/w H & F.
(Absolute Adv - A. Smith, comparitive Adv - David Ricardo)

↳ Endowment Difference b/w H & F. [Endowment of factors of prodn differ b/w 2 countries].

∴ Heckstein-Ohlin Model (HO Model) & Stolper-Samuelson Theorem (SS Theorem).

Absolute Advantage - Adam Smith

$2 \times 2 \times 1$ Framework [2 Countries, 2 commodities, 1 Factor of Production]

2x2x1 Framework [2 countries, 2 commodities, 1 Factor of Production (Labour)]

Assume that both H & F are endowed with $\bar{L}$ units of labour. Consider the 2 goods to be X, Y

Technological differences in prodn is captured by factor coeffs.

Define: l_{xh} = Labour coeff for Good X in H $= \left(\frac{L_x}{X}\right)$

[To produce 1 unit of Good, how much Labour is reqd $= l_{xh}$]

Similarly define: l_{yh}, l_{xf}, l_{yf}

Assume: $l_{xh} < l_{xf}$ [H is more effecient in prodn of X]

$l_{yh} > l_{yf}$ [F is more effecient in prodn of Y]

H is technologically superior in prodn of X

F is technologically superior in prodn of Y

Evaluate the pattern of trade under this situation:

(i) Obtain the autarky relative price for H & F (p_d, p_f):

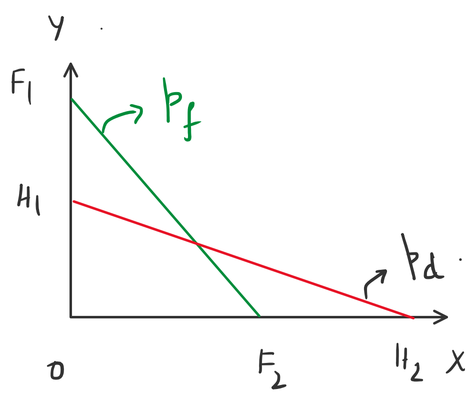
PPF_H: $L_X + L_Y = \bar{L} \Rightarrow l_{xh} \cdot X + l_{yh} \cdot Y = \bar{L}$ --- (i)

PPF_F: $l_{xf} \cdot X + l_{yf} \cdot Y = \bar{L}$ ---- (ii)

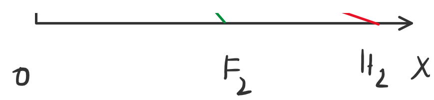
Slope of PPF_H: $l_{xh} \cdot dX + l_{yh} \cdot dY = 0$.

$$\left.\frac{dY}{dX}\right|_{PPF_H} = -\frac{l_{xh}}{l_{yh}}$$

Slope of PPF_F: $l_{xf} \cdot dX + l_{yf} \cdot dY = 0$



Slope of PPF_F : $l_{xf} \cdot dx + l_{yf} \cdot dy = 0$



$$\left.\frac{dy}{dx}\right|_{PPF_F} = -\frac{l_{xf}}{l_{yf}}.$$

$$\left|\frac{dy}{dx}\right|_H = \left(\frac{l_{xh}\downarrow}{l_{yh}\uparrow}\right)\downarrow \qquad \left|\frac{dy}{dx}\right|_F = \left(\frac{l_{xf}\uparrow}{l_{yh}\downarrow}\right)\uparrow$$

Assumed:
$l_{xh} < l_{xf}$
$l_{yh} > l_{yf}$

$\therefore$ PPF_F is steeper than PPF_H.

Given a competitive framework, in both H & F:
P = AC in both sector X & Y.

For H: $P_X = AC_X = \frac{TC_X}{X} = \frac{w^H L_X}{X} = w^H \left(\frac{L_X}{X}\right) = w^H l_{xh}$

$P_Y = AC_Y = w^H l_{yh}$

$\therefore$ Autarky relative price for $H = p_d = \frac{P_X}{P_Y} = \left(\frac{l_{xh}}{l_{yh}}\right)$

$$\therefore \quad p_d = \left(\frac{l_{xh}}{l_{yh}}\right) = \left|\frac{dy}{dx}\right|_H = MRPT_H.$$

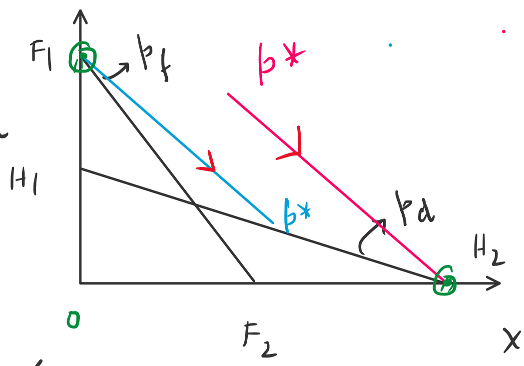
For F: Similarly $p_f = \left(\frac{l_{xf}}{l_{yf}}\right) = \left|\frac{dy}{dx}\right|_F = MRPT_F$.

Given the structure $p_d < p_f \Rightarrow$ Autarky prices differ.
$\therefore$ When H & F will trade, international price p^* will s.t $p_d < p^* < p_f$. [$\because p_d < p_f \Rightarrow$ Relative of Good X is lesser in Home, H → Export X, F → Export F].

Under Trade:

Y

H → only produces X
F → only produces Y
⇒ Complete specialization



H → Export X, Import Y
F → Export Y, Import X
Pattern of Trade.