

Lecture #5 Specific Factors Model, Part II

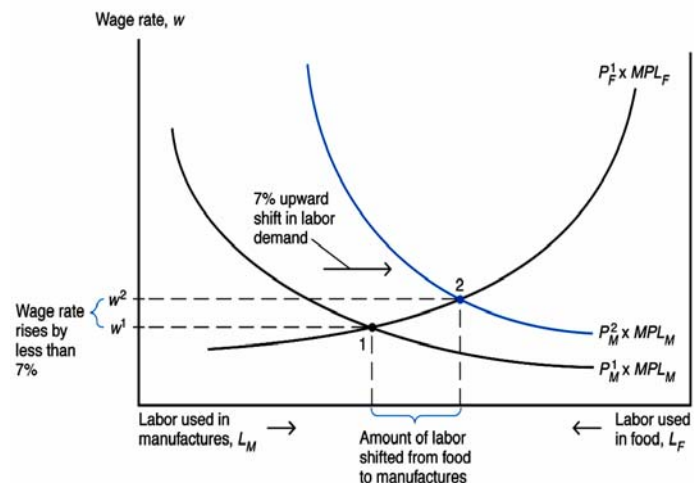
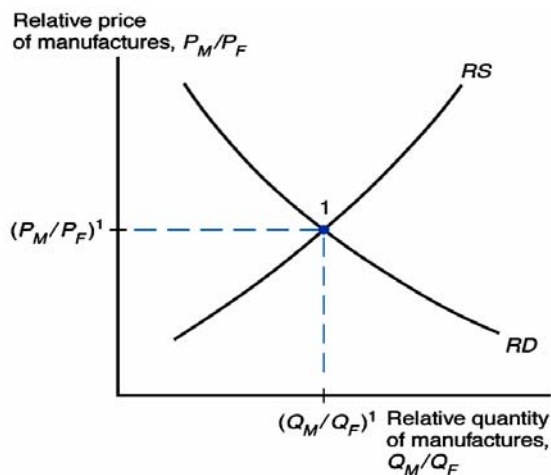
ASSIGNMENT 1 DUE BEGINNING OF CLASS THURSDAY (ON WEBSITE)

Summary from last class:

- Equilibrium in the labor market ($P_M \times MPL_M = P_F \times MPL_F = w$)
- Implying $P_M/P_F = P_{M^L}/P_{F^L}$ (Can also derive this algebraically!)

I. Autarky (Pre-trade) equilibrium

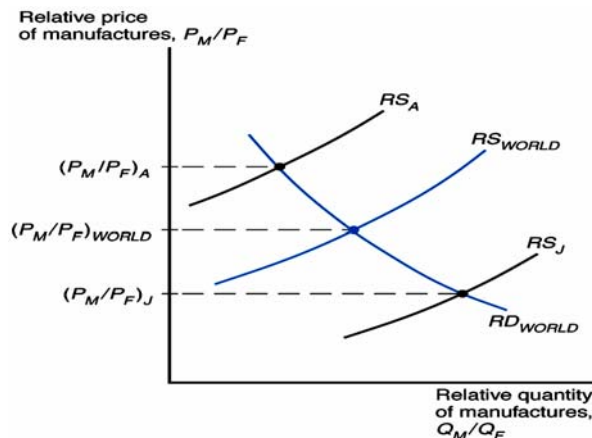
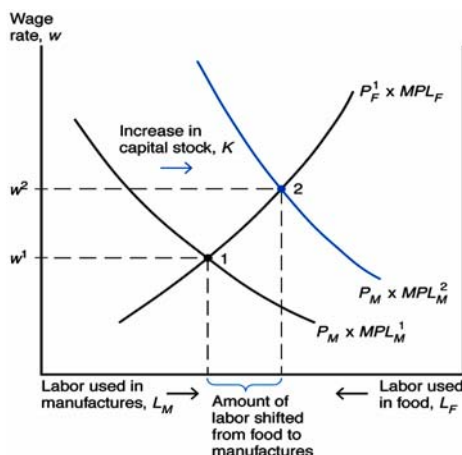
Can draw supply and demand before trade: relative prices P_M/P_F on the vertical axis and relative quantities (Q_M/Q_F) on the horizontal axis. As with Ricardian framework, do not derive relative demand but assume it is downward sloping. How do we know what relative supply looks like?



Why RS slopes upward: Suppose P_M rises, and P_F stays constant. As the graph above (and to the right) shows, labor demand shifts up, leading to equilibrium at point 2. At this new point, more labor in manufacturing production so Q_M/Q_F rises.

II. What determines comparative advantage, the pattern of trade, and the free trade equilibrium?

Consider trade between the USA and Japan. Suppose both countries alike in tastes, labor endowments, and technology, but USA has more land and Japan has more capital stock. If Japan has more capital stock, then MPL_M curve shifts to right for Japan and at each relative price P_M/P_F , Japan willing to supply more Q_M/Q_F . So Japan's relative supply curve lies below and to the right of the US relative supply curve.



So for Japan in autarky—before trade—it is true that $(P_M/P_F) < (P_M/P_F)$ for USA in autarky. Consequently, Japan has a comparative advantage in manufactured goods. With trade, it produces relatively more manufactured goods and exports them to the USA. USA has a comparative advantage in food and exports food to Japan.

KEY: The pattern of trade and comparative advantage in the specific factor model is determined by the differences in the relative factor endowments of the specific factors across countries. Technology differences are not the basis for trade, as in the Ricardian framework.

What will happen when the two countries trade? The relative free trade price will lie between the two autarky relative prices:

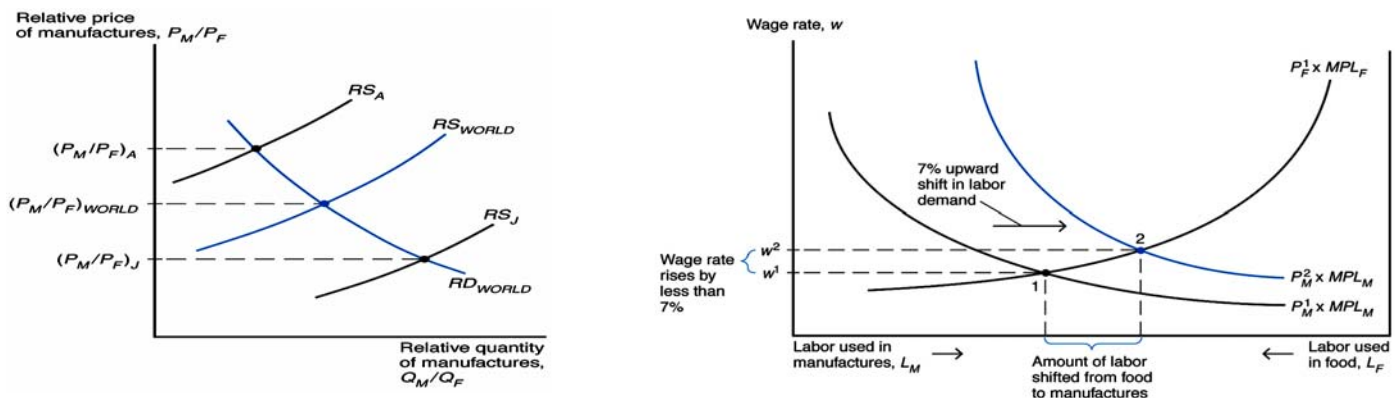
$$P_M/P_F \text{ (Japan in autarky)} < P_M/P_F \text{ (free trade)} < P_M/P_F \text{ (USA in autarky)}$$

III. Some additional issues

- We can show with algebra that increasing K leads to an increase in MPL_M . We assume a specific kind of production function—a Cobb-Douglas production function. $Q_M = L_M^{1/2} K_M^{1/2}$. This is constant returns to scale (CRTS) since $1/2 + 1/2 = 1$. $MPL_M = \partial Q_M / \partial L = 1/2 (K_M / L_M)^{1/2} = MPL_M(L_M, K_M)$. Increase in L_M leads to a fall in MPL_M . Increase in K_M leads to a rise in MPL_M . We can do the same for capital: $MPK_M = \partial Q_M / \partial K_M = 1/2 (L_M / K_M)^{1/2} = MPK_M(L_M, K_M)$. Increase in L_M leads to a rise in MPK_M . Increase in K_M leads to a fall in MPK_M .
- We can also show what happens with trade using the production possibility frontier.

IV. Who gains and who loses from trade?

We can now analyze who gains and who loses from trade. We'll examine the distributional effects of opening up to trade from the Japanese perspective. Recall that if Japan has more capital and less land relative to the USA, opening up to trade will lead to an increase in P_M/P_F relative to the autarky price. This is because Japan has a comparative advantage in manufactures relative to food. We can think of this price increase as P_M rising but no change in P_F . With trade, the relative price of manufactures rises relative to Japan's autarky relative price (left hand side diagram). So what happens to wages if P_M rises (and assume there is no change in P_F). We see that the Value of MPL curve ($= P_M \times PML_M$) for manufactures shifts up and to the right as P_M rises, resulting in a higher w and more labor allocated to manufactures.



Although nominal w rises, impact of trade on the mobile factor is **ambiguous** because its real income increases in terms of the imported good (food), and decreases in terms of the exported good (manufactures). W rises (from w^1 to w^2)/ P_F (no change) = real w rises in terms of food.

But w/P_M falls because P_M rise higher than w rise (we see this on the graph at upper right).

Overall gain to labor depends on how much of the exported and imported goods the workers consume.