Lecture 5 Specific Factors Model

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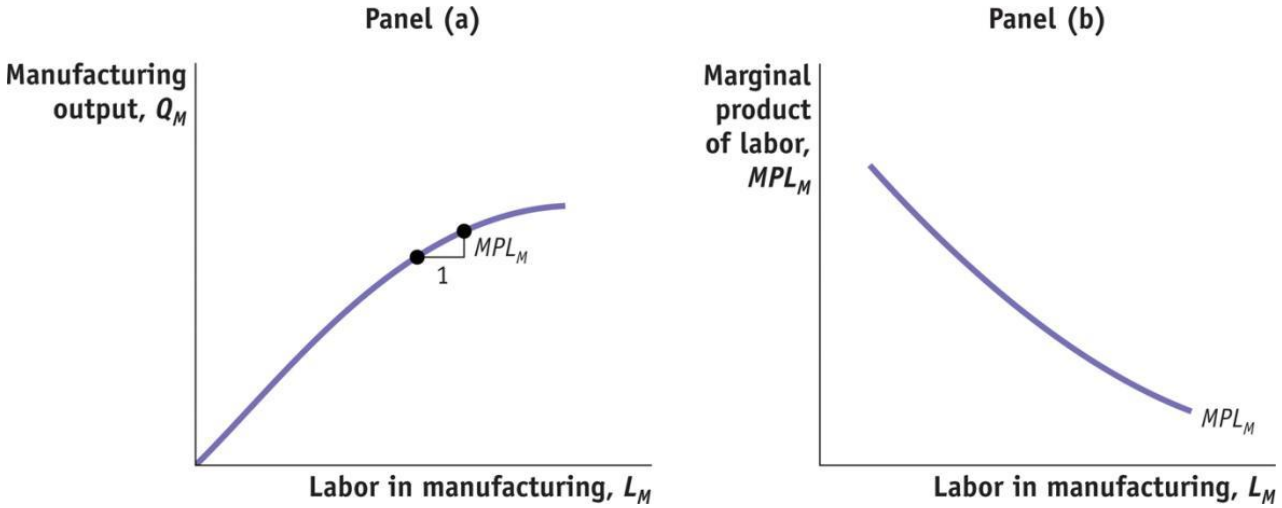
Reference: Feenstra and Taylor, 2017, CH3 Gains and Losses from Trade in the Specific-Factors Model

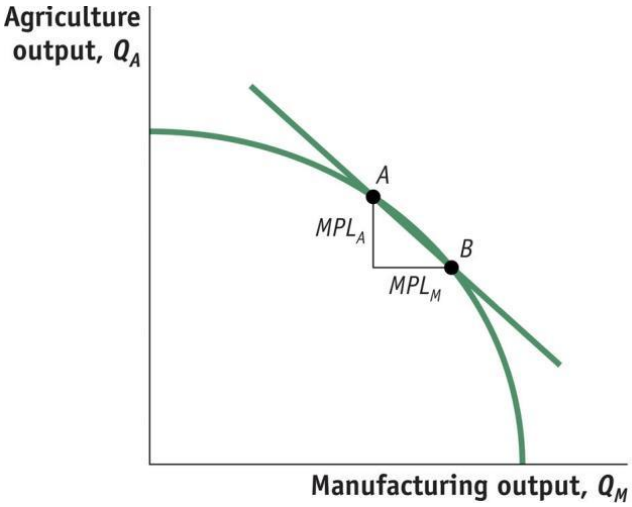
In absolute advantage and comparative advantage trade models, only one production factor is assumed. In terms of resource allocation and income distribution, trade equilibrium is proved to be strictly better than autarky equilibrium (why?). However, the one-factor analysis has little real-life implications for income distribution among different production factors (labor, capital, land). Within the analytical framework of classical economics, the specific factors model examines income distribution effect of trade in the short run. It helps understand the winners and losers from international trade.

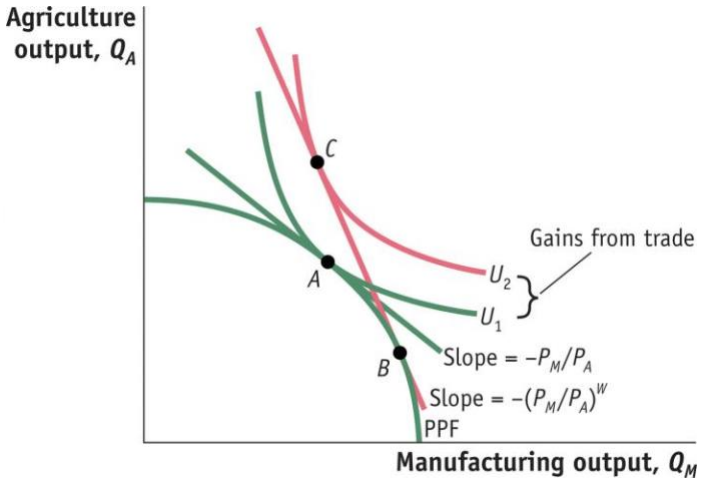
I. Model Assumptions
1. Two countries, two industries, two production factors
2. Two industries (sectors): manufacturing (M) and agricultural (A)
3. Two production factors: mobile factor (L) and specific factors (K and T)
4. Mobile factor can move across sectors, specific factor only applies to one sector
5. Manufacturing industry employs K and L; agricultural industry employs T and L
6. No transportation and transaction costs; all markets clear

II. Production and Trade
1. The law of diminishing marginal product: K fixed, as L increases, MPL will fall eventually.
2. Two-factor production implies diminishing MP and concave production possibilities frontier PPF.



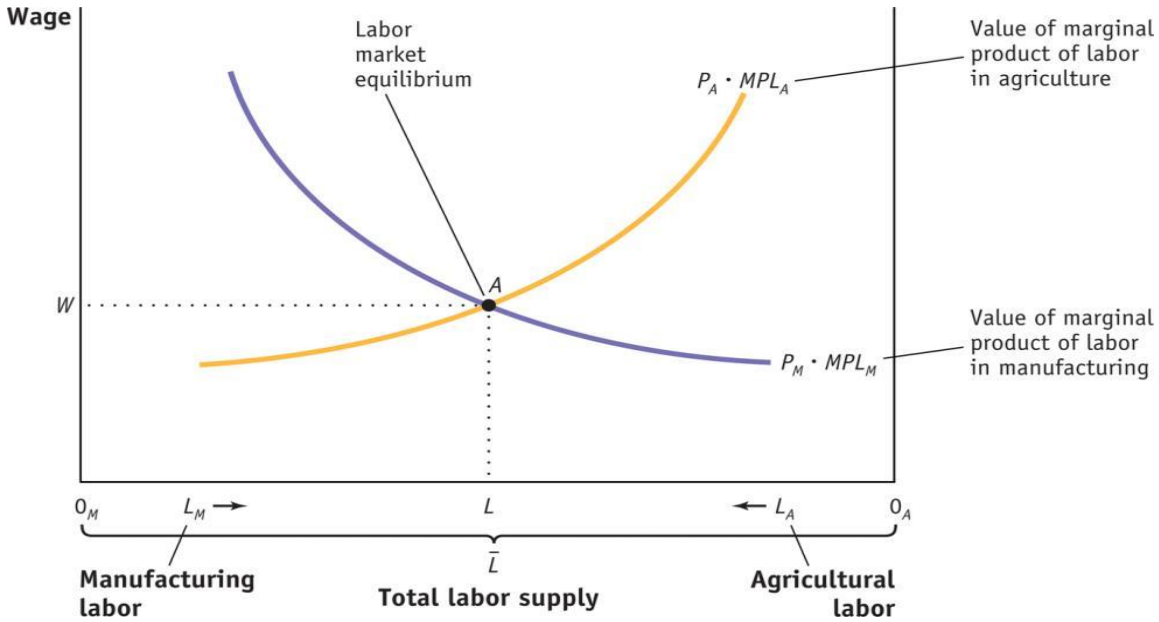
3. Gains from trade (U2>U1) under (Pm/Pa)*>Pm/Pa





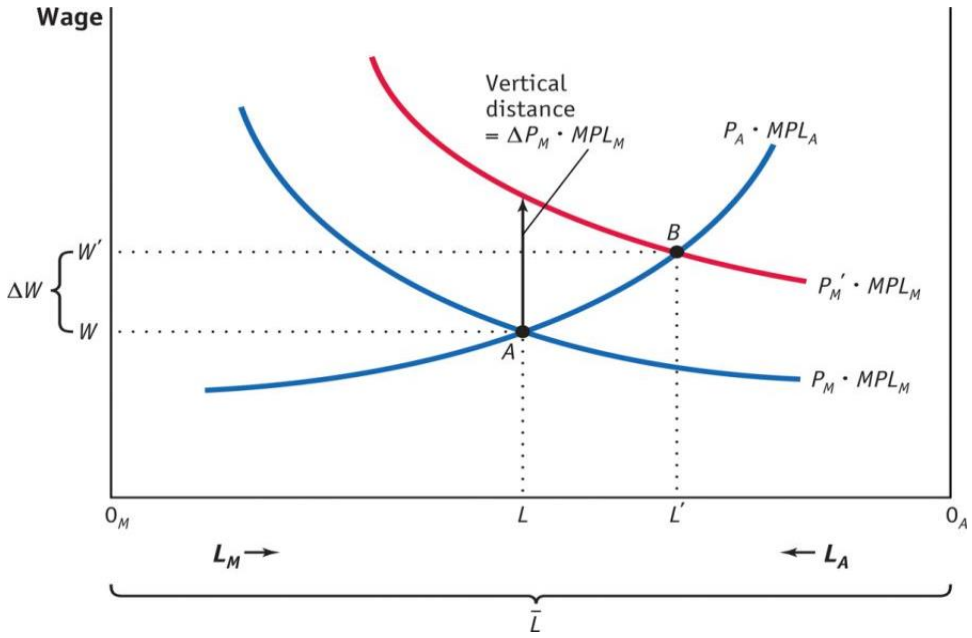
III. Autarky Equilibrium – Home Labor Market

1. In labor market equilibrium, all workers are fully employed and wage is determined by the demand and supply of labor force in both sectors.
2. For simplicity, total supply labor is given by the factor endowment in the country.
3. Demand for labor is determined by the firm that follows the profit maximization principle: the firm hire workers to the point where MC=MR. The marginal cost of a worker is the hourly wage whereas the marginal revenue of the worker is MPL*P, the market value created by the worker (MPL is the quantity of the product produced by the marginal worker).



IV. Trade Equilibrium – Home Labor Market

1. Pm rises to Pm' as a result of higher demand from foreign country
2. Manufacturing sector expands and hires more labor, demand for labor rises
3. Wage will rise to W' in both industries, but less than the change in Pm
4. Labor flows from agricultural (A) sector to manufacturing (M) sector



V. Income Distribution Effects of Trade in Home Country

What would be the effects of trade on the incomes of different production factor owners (labor, capital, and land)? To measure the income distribution effects from international trade, economists apply the concept of real income/output/return instead of nominal income. Real income can be defined as the real quantity of the goods the factor owner could purchase with his/her nominal income earned (wage, interest, rent), which equals marginal factor productivity in equilibrium.

Real Income=Nominal Income/Price

1. Mobile factor: real wages (W/P=MPL)

1) Home domestic price of manufactured goods increases (Pm/Pa)*>(Pm/Pa)
2) Wage does not increase as much as Pm increases, implied by the specific factors model
3) Real wage in terms of manufactured product declines because (W/Pm)'<(W/Pm), this means marginal product of labor declines in the manufacturing industry. How is MPL in the other sector?
4) Real wage in terms of agricultural product (W/Pa)' increases, suppose Pa constant or decreasing
5) Is the well-being of home country workers better off or worse off after trade? How does this result compare with the implications from the previous one-factor trade models?

2. Specific factors: real interest (RK/P=MPK) and real rent (RT/P=MPT)

1) The law of diminishing marginal product: K fixed, as L increases, MPL will fall eventually. The enhanced law of marginal product: the increase in the labor-capital ratio (i.e., more labor per unit of capital) will lead to a decrease in marginal product of labor MPL and an increase in marginal product of capital MPK.

2) Because manufacturing sector expands due to its comparative advantage in trade, as labor flows in, the marginal product of capital MPK will rise after trade; the agricultural sector shrinks due to its comparative disadvantage in trade, the marginal product of land MPT will fall as labor outflows.

3) For capital owners in the M sector: MPK'>MPK. Capital owners' real income in terms of purchasing manufacturing goods rises (RK'/Pm'>RK/Pm). Since Pm'>Pm, this implies RK rises more than the increase in Pm. Capital owners' real income in terms of purchasing agricultural products rises more significantly (RK'/Pa'>>RK/Pa) because RK rises but Pa fall.

4) For the land owners in the A sector: MPT'<MPT. Landlord's real income in terms of agricultural products falls (RT'/Pa'<RT/Pa). Since Pa'<Pa, this implies RT fall more than Pa falls. RT/Pm decreases more significantly because RT fall but Pm rises (RT'/Pm'<<RT/Pm).

5) Conclusion: in the short run when labor is the mobile factor, international trade will benefit the specific factor in the export sector (advantaged) but will harm the specific factor in the import sector (disadvantaged). It is not clear for the mobile factor.

3. Empirical evidence and public policies

1) The fact that some people are harmed because trade sometimes creates social tensions that may be strong enough to topple governments. A recent example is Bolivia, where the citizens in the early 2000s could not agree on how to share the gains from exporting natural gas.

2) In the United States, about two-thirds of people laid off from manufacturing or services find new jobs within two or three years, though sometimes at lower wages. In the three years from January 2011 to December 2013, about 0.77 million workers were displaced in manufacturing and 3.2 million in all service industries. Roughly 62% of the workers displaced from 2011 to 2013 were reemployed by January 2014. In manufacturing, more than one-half (57%) were earning less in their new jobs, while nearly three-quarters (72%) of the workers reemployed in service industries were earning more at their new job.

   Both manufacturing employment and its share in total employment have been falling over time, indicating that the service sector has been growing. While wages were slightly higher in manufacturing than in all private services from 1974 through 2007, all private service wages have been higher since 2008. This change is due in part to the effect of wages in the information service industry, which are substantially higher than those in manufacturing.

Figure: U.S. manufacturing sector employment, 1973-2014

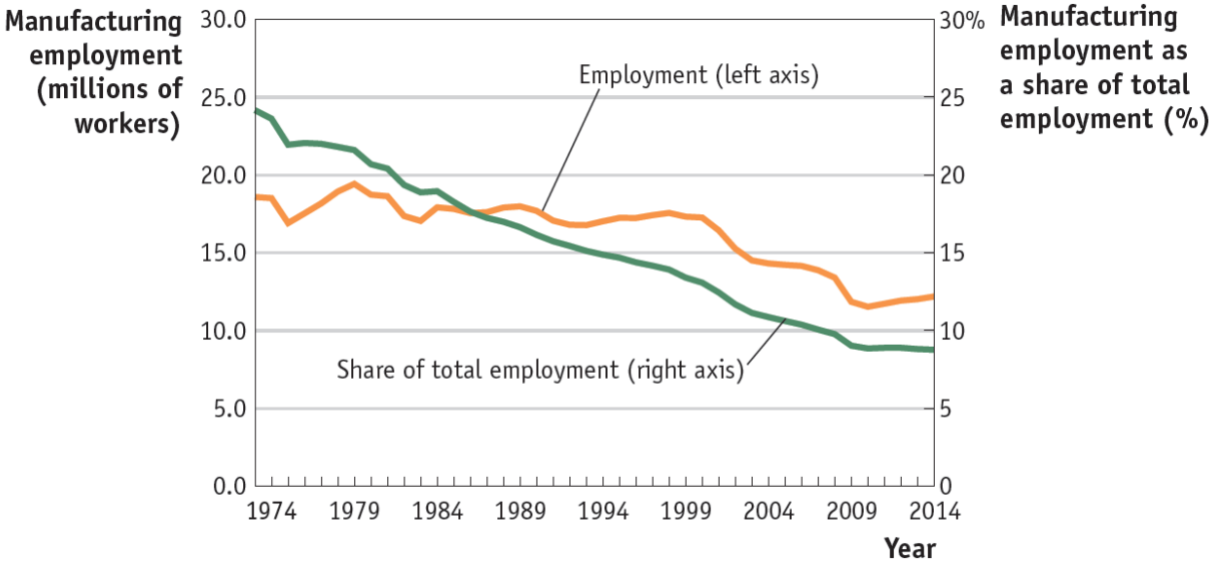


Figure: U.S. real hourly earnings of production workers, 1974-2014

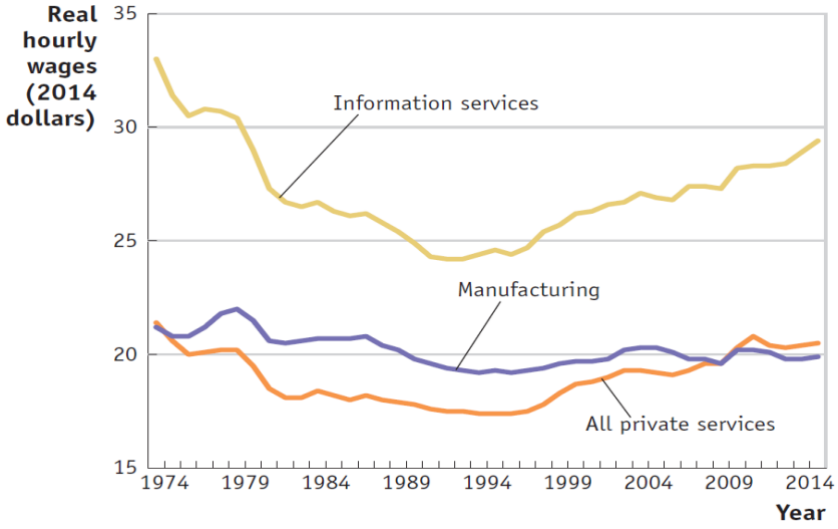


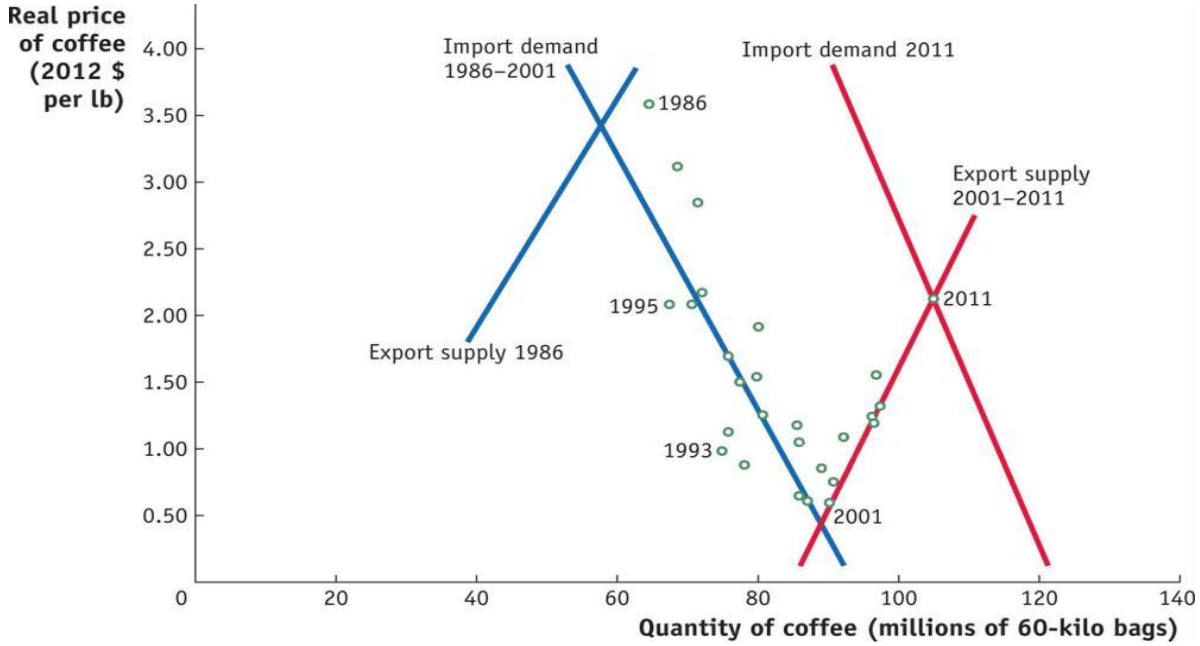
Table: Job losses in manufacturing and service industries, 2011-2013

Industry	Total Displaced Workers (thousands) Jan 2011–Dec 2013	PERCENTAGES		
		Workers Reemployed by Jan 2014	Of the Workers Reemployed:	
			Earn Less in New Job	Earn Same or More in New Job
Total	4,292	61%	48%	52%
Manufacturing industries	765	59%	57%	43%
Service industries	3,146	62%	72%	28%

3) Trade Adjustment Assistance (TAA) policies are intended to compensate those who are harmed due to trade by providing additional income during the period of unemployment. Recently, the Trade Adjustment Assistance program in the United States was expanded to include workers laid off due to trade in service industries.

   Kennedy first introduced the TAA program in the United States in 1962, for workers in manufacturing. Kennedy's concerns remain relevant: Technology and trade mean growth, innovation, and better living standards, but also change and instability. A recent development, which was part of the jobs stimulus bill signed by President Obama on February 17, 2009, allows workers in the service sector (as well as farmers) who lose their jobs due to trade to also apply for TAA benefits. Other countries also have programs like TAA to compensate those harmed by trade.

4) According to the specific factors model, huge swings in coffee prices are extremely disruptive to the real earnings of landowners in coffee-exporting developing countries, many of whom are small farmers and their families. TransFair USA and similar organizations purchase coffee at higher than the market price when the market is low (as in 2001), but in other years (like 2005) the fair-trade price is below the market price. Essentially, TransFair USA is offering farmers a form of insurance whereby the fair-trade price of coffee will not fluctuate too much, ensuring them a more stable source of income over time.



Readings

PIIE Trade Talks Episode 35: The Labor of NAFTA
https://piie.com/experts/peterson-perspectives/trade-talks-episode-35-labor-nafta

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https://www.marketwatch.com/story/china-really-is-to-blame-for-millions-of-lost-us-manufacturing-jobs-new-study-finds-2018-05-14