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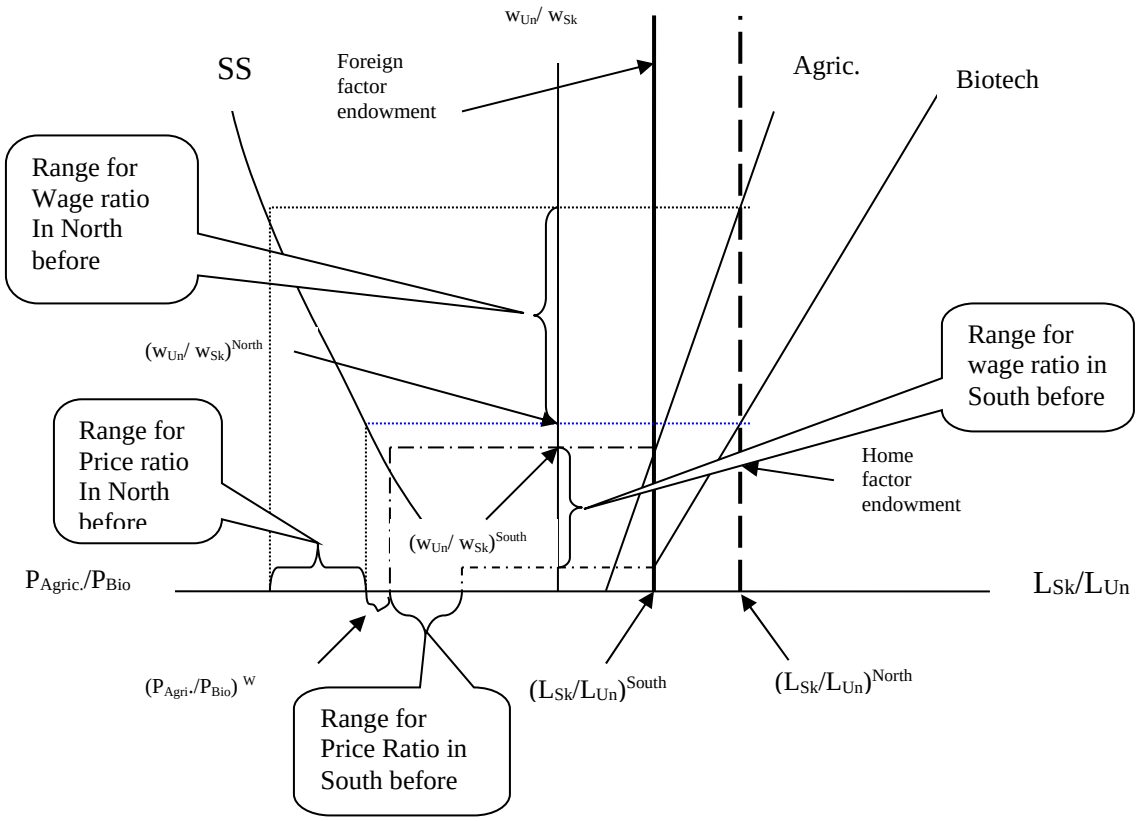
Notes on Trade and Income Inequality

1. Interpretation in a Two Sector Hecksher-Ohlin World

Consider a two country world, with "North" relatively abundant in high skilled labor and "South" relatively abundant in unskilled labor.

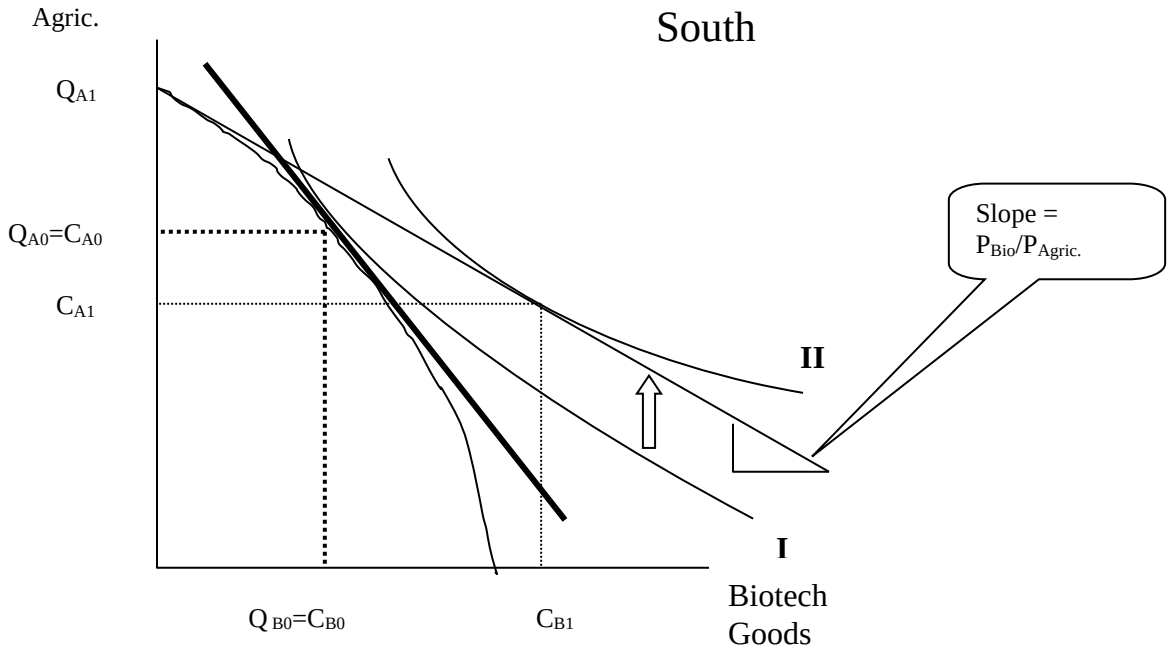
Assume high skilled labor is used intensively in biotechnology, while low skilled labor is used intensively in agriculture.

Assume North and South are initially engaged in free trade. What happens if trade is opened up between the two economies, in terms of production patterns?



In the picture above, endowments are such that there is no factor price equalization, and the relative price of Agricultural goods relative to Biotech goods are in the indicated ranges. The economies are incompletely specialized. After trade is opened up, the price ratio moves to the range indicated as $(P_{Agric.}/P_{Bio.})^W$. The relative wage ratios move to the extremes of the ranges. North and South now specialize, as indicated by "After". North produces biotech, South agriculture.

Note that "South" benefits from the opening up. This can be seen by reference to the production possibilities frontier (PPF) for South.



Initially, South is *not* specialized, so $Q_{A0} = C_{A0}$ and $Q_{B0} = C_{B0}$. When trade is closed, then South must produce what it consumes. This means that the Indifference Curve is tangent to the price line which is also tangent to the PPF. When trade opens up, then $Q_{A1} > 0$, and $Q_{B1} = 0$; the relative price is given by $P_{Bio}/P_{Agric.}$, and the utility level is associated with Indifference Curve II. Notice further that the relative price line is now flatter, indicating that it takes fewer units of Agriculture to purchase a single unit of Biotech, i.e., Biotech is now less expensive. Finally, note that consumption is on Indifference Curve II, which is higher than Indifference Curve I, indicating that there is a increase in welfare for South.

2. Complications (Haskill et al., 2012).

Five trends:

- Political barriers decline (WTO, China accession)
- Information and Communication Technologies
- Productivity acceleration (as of 2012)
- Acceleration in emerging market growth (as of 2012)
- Surge in international trade and investment.

Three factors:

- Weak earning over time
- Slight rise in income inequality in middle of distribution
- Highest earning group did see increase

Figure 1

Changes in U.S. Real Income, Working Adults, by Education and for Top 1 Percent

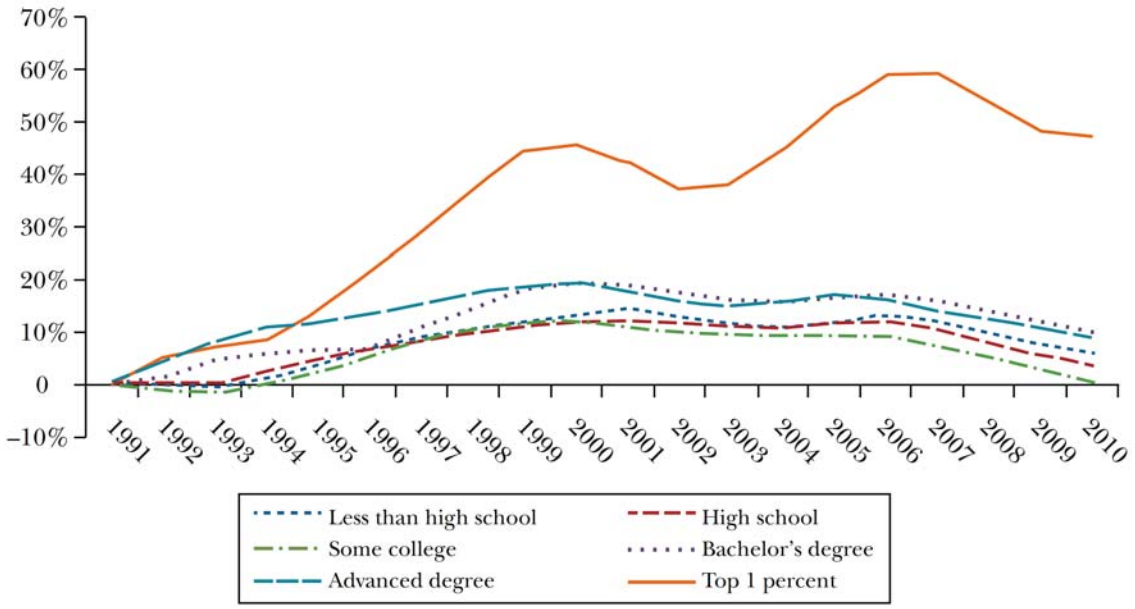
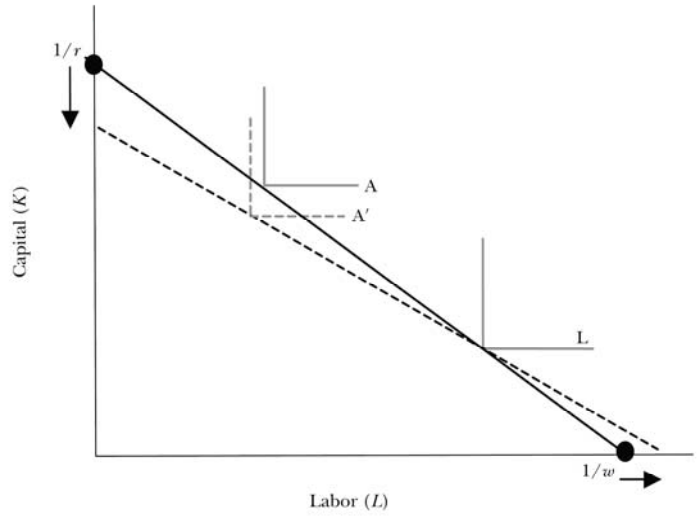
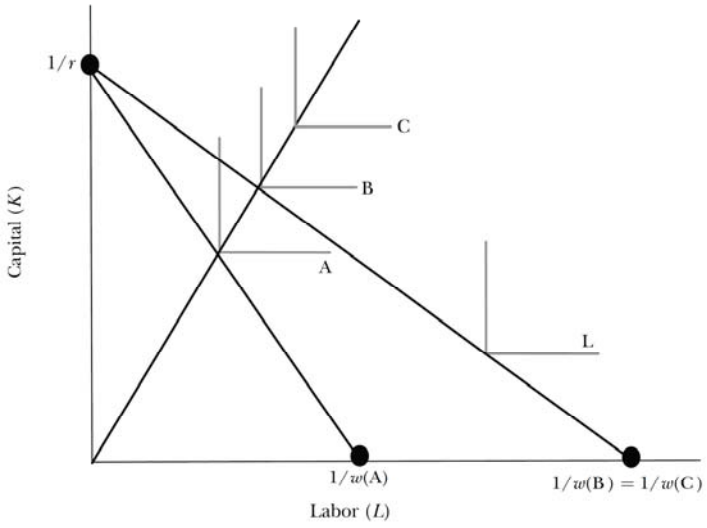


Figure 2
A Basic Heckscher–Ohlin Model



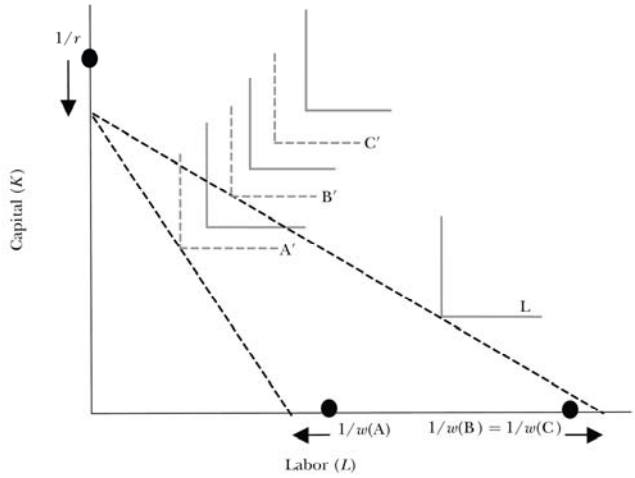
Notes: The axes show quantities of labor and capital. There are two industries (A and L), the upper left using capital intensively relative to the lower right. The right-angle shaped lines are unit-value isoquants, showing combinations of labor and capital needed to produce one dollar's worth of the two goods. The downward-sloping lines are isocost lines showing the combination of capital costs and wages such that there is full employment of factors at given technologies and product market prices. The dotted isocost line corresponds to a rise in the relative price of the capital-intensive goods. The heavy dot intercepts on the *x*- and *y*-axes show the reciprocal of the equilibrium factor prices of *L* and *K*, so a movement on the axis towards the origin is an increase in factor prices.

Figure 3
A Richer Heckscher–Ohlin Model



Notes: In Figure 2, there is only one worker type. Here, there are three workers types: highly talented to less talented (A to C). The highly talented are assumed more productive in the capital-intensive industry. All talent types are assumed equally productive in the labor-intensive industry. The downward-sloping isocost line show the combination of capital costs and wages so there is full employment of all talent types and types B and C are indifferent between the industries they choose. See also the notes to Figure 2.

Figure 4
Changes in the Richer Heckscher–Ohlin Model



Notes: The dotted "right-angle" shapes are unit-value isoquants following a rise in relative prices or technical change in the capital-intensive industry. The dotted isocost lines show the combination of capital costs and wages so there is full employment of all talent types and types B and C are indifferent between the industries they choose after the increase in output prices in the capital-intensive industry. The arrows on the axes originating from the heavy dots show the rise in capital prices and wages of type A's and the fall in wages of type B's and type C's. See also the notes to Figure 3.

Extensions

- Differential effects of different types of technological growth (could enhance most productive [A] or less productive [C], leading to increase or decrease in inequality)
- Differentiated firms (in terms of productivity) mean larger firms export, and larger firms employ better labor mixes, able to pay higher wages.

3. China Syndrome (Autor, 2013): Prices or quantities?

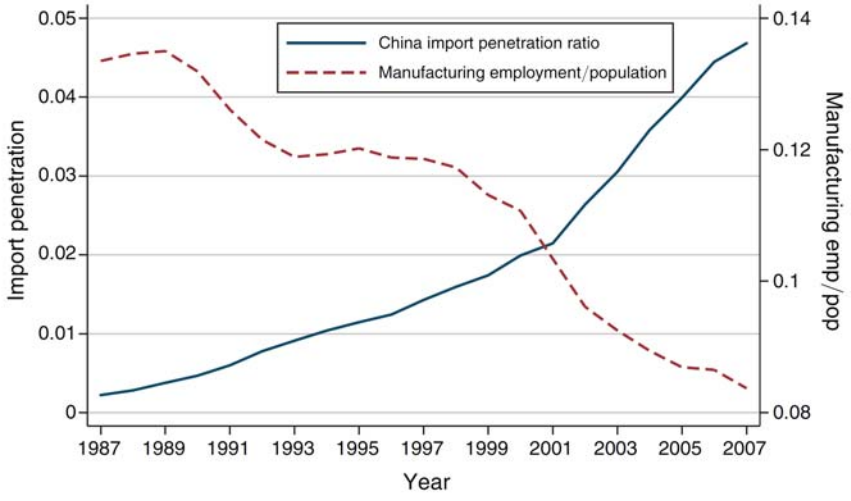


FIGURE 1. IMPORT PENETRATION RATIO FOR US IMPORTS FROM CHINA (*left scale*), AND SHARE OF US WORKING-AGE POPULATION EMPLOYED IN MANUFACTURING (*right scale*)

TABLE 2—IMPORTS FROM CHINA AND CHANGE OF MANUFACTURING EMPLOYMENT IN CZs, 1970–2007: 2SLS ESTIMATES

Dependent variable: 10 × annual change in manufacturing emp/working-age pop (in % pts)

	I. 1990–2007			II. 1970–1990 (pre-exposure)		
	1990–2000 (1)	2000–2007 (2)	1990–2007 (3)	1970–1980 (4)	1980–1990 (5)	1970–1990 (6)
(Δ current period imports from China to US)/worker	−0.89*** (0.18)	−0.72*** (0.06)	−0.75*** (0.07)			
(Δ future period imports from China to US)/worker				0.43*** (0.15)	−0.13 (0.13)	0.15 (0.09)

Notes: $N = 722$, except $N = 1{,}444$ in stacked first difference models of columns 3 and 6. The variable "future period imports" is defined as the average of the growth of a CZ's import exposure during the periods 1990–2000 and 2000–2007. All regressions include a constant and the models in columns 3 and 6 include a time dummy. Robust standard errors in parentheses are clustered on state. Models are weighted by start of period CZ share of national population.

TABLE 3—IMPORTS FROM CHINA AND CHANGE OF MANUFACTURING EMPLOYMENT IN CZs, 1990–2007: 2SLS ESTIMATES

Dependent variable: 10 × annual change in manufacturing emp/working-age pop (in % pts)

	I. 1990–2007 stacked first differences					
	(1)	(2)	(3)	(4)	(5)	(6)
(Δ imports from China to US)/worker	−0.746*** (0.068)	−0.610*** (0.094)	−0.538*** (0.091)	−0.508*** (0.081)	−0.562*** (0.096)	−0.596*** (0.099)
Percentage of employment in manufacturing$_{-1}$		−0.035 (0.022)	−0.052*** (0.020)	−0.061*** (0.017)	−0.056*** (0.016)	−0.040*** (0.013)
Percentage of college-educated population$_{-1}$				−0.008 (0.016)		0.013 (0.012)
Percentage of foreign-born population$_{-1}$				−0.007 (0.008)		0.030*** (0.011)
Percentage of employment among women$_{-1}$				−0.054** (0.025)		−0.006 (0.024)
Percentage of employment in routine occupations$_{-1}$					−0.230*** (0.063)	−0.245*** (0.064)
Average offshorability index of occupations$_{-1}$					0.244 (0.252)	−0.059 (0.237)
Census division dummies	No	No	Yes	Yes	Yes	Yes
	II. 2SLS first stage estimates					
(Δ imports from China to OTH)/worker	0.792*** (0.079)	0.664*** (0.086)	0.652*** (0.090)	0.635*** (0.090)	0.638*** (0.087)	0.631*** (0.087)
R^2	0.54	0.57	0.58	0.58	0.58	0.58

Notes: $N = 1{,}444$ (722 commuting zones × 2 time periods). All regressions include a constant and a dummy for the 2000–2007 period. First stage estimates in panel II also include the control variables that are indicated in the corresponding columns of panel I. Routine occupations are defined such that they account for 1/3 of US employment in 1980. The offshorability index variable is standardized to mean of 0 and standard deviation of 10 in 1980. Robust standard errors in parentheses are clustered on state. Models are weighted by start of period CZ share of national population.