Lecture 7 International Factor Movement

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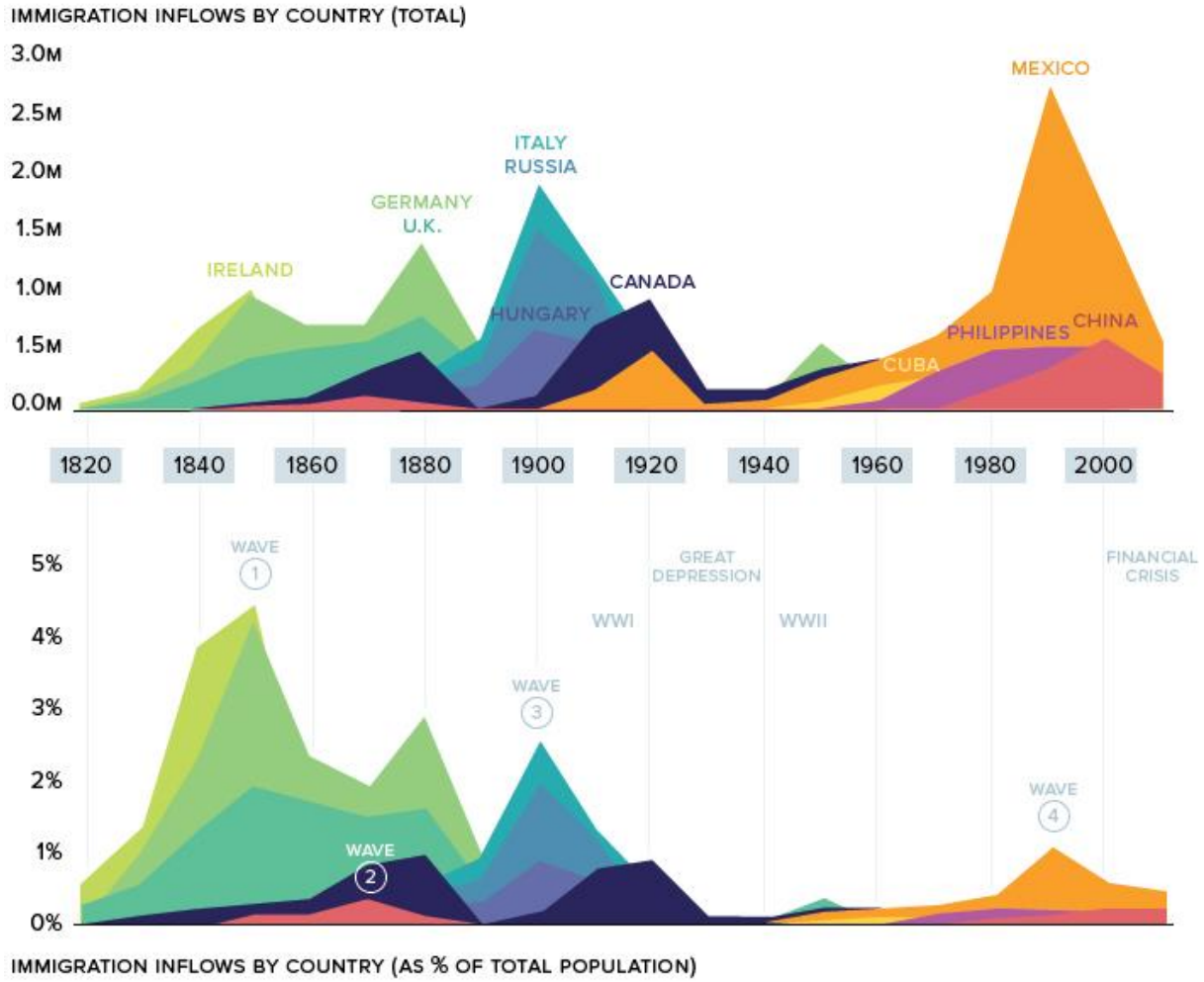
Reference: Feenstra and Taylor (2017): CH5 Movement of Labor and Capital Between Countries

Specific factor model examines income distribution effects of trade in the short run—the owner of the specific factor in the export sector will benefit but the owner of the specific factor in the import sector will lose. And the real gains to owner of mobile factor is uncertain. H-O factor endowment model studies income distribution effects of trade in the long run when all production factors can adjust—international trade will benefit the abundant factors but harms the scarce factors. Both the specific factor model and the factor endowment model assume production factors are restricted to domestic production without mobility across national borders. This lecture relaxes the assumption and examines the effects of factor movement across borders on resource allocation and income distribution in the short and long run.



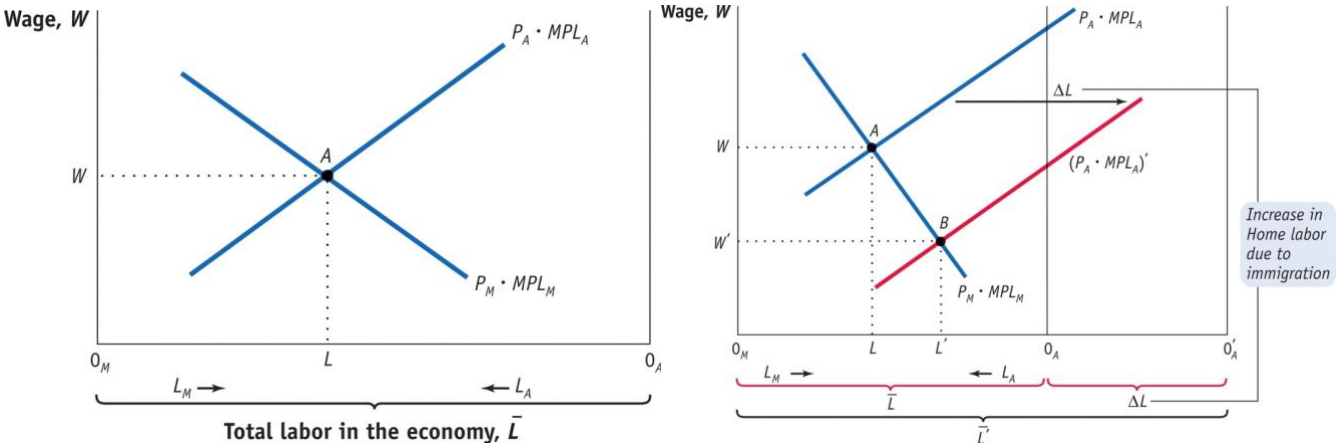
https://www.visualcapitalist.com/two-centuries-of-immigration/

I. Political Decision and Public Policy on Immigration

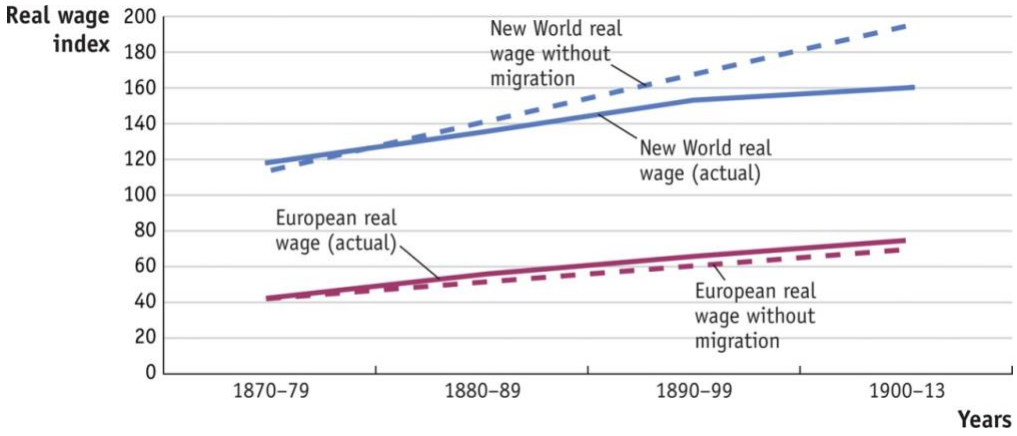
1. 2018 Trump administration immigration policy reform
2. 2015 EU refugee crisis (millions of immigrants from the Middle East and Africa seeking asylum)
3. 1980 Mariel boat lift: influx of about 125,000 refugees from Cuba to Miami

II. Effects of Immigration in the Short Run (W'<W, MPL'<MPL & MPK'>MPK, R'>R)

1. In labor market equilibrium, wage and total employment are determined simultaneously in both industries by the W=P*MPL condition. MPL follows the law of diminishing marginal product.
2. In the short run, holding the amount of capital and land fixed in both industries, as in the specific-factors model, immigration leads to a fall in wages. This was the case, for example, with the mass migration to the New World in the nineteenth century.



3. Evidence: Immigration to the New World. Large-scale migration from Europe to the New World in America and Australia closed the wage gap between the two locations. In 1870 wages in the New World were almost three times as high as wages in Europe, whereas in 1910 they were about twice as high. Migration also slowed the growth of wages in the New World relative to what they would have been without migration and allowed for slightly faster growth of wages in Europe.

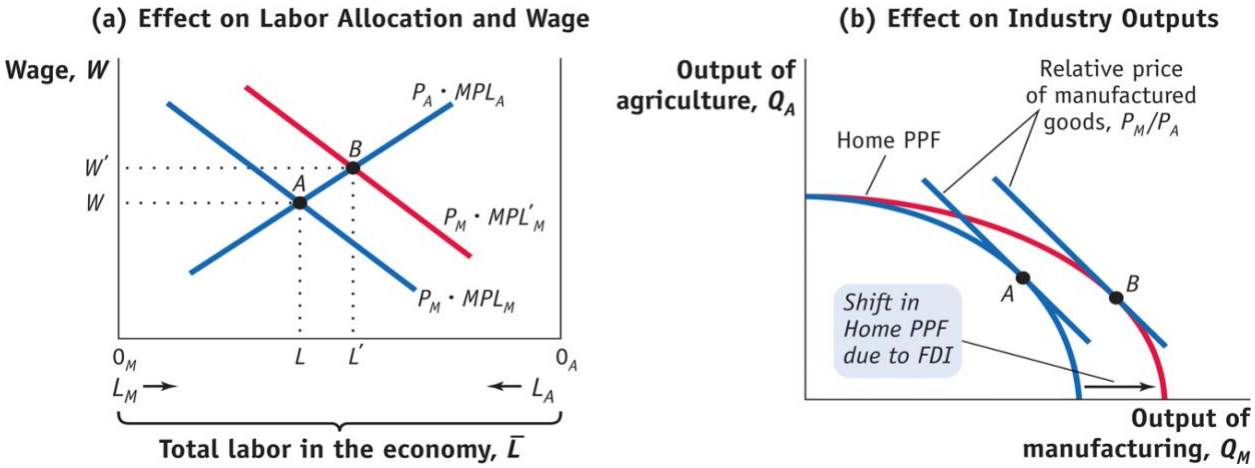


4. What would happen to industry outputs? Answer: Both industries will experience a boost. Why?

5. What would happen to the income of the capitalists? MPK and RK rise. Why?
6. What would happen to the income of the landlords? MPT and RT rise as well. Why?
7. Thus, entrepreneurs and landowners support open borders while local unions and workers do not.
8. Summary: Because wages are lower due to the influx of foreign workers, the rentals to capital and land are higher. Additionally, the rise in the rentals on capital and land occurs because the increase in labor hired in each industry raises the marginal product of both capital and land. Thus, owners of capital and land generally oppose policies that restrict immigration for those that would allow foreign workers to freely work in their industries, whereas workers, particularly unions, support stricter immigration laws to lessen competition for jobs and decreases in their wages.
9. **Counterexample**: During May and September 1980, 125,000 Cubans left the port of Mariel, Cuba, for Miami, which increased the host city's population by about 7%. Despite the large supply of low-skilled immigrants from Cuba, and contrary to predicted economic theories, the wages of low-skilled workers in Miami did not vary much relative to the national trend.
10. **Counterexample**: The migration of 670,000 Russian Jews to Israel from late 1989 to 1996. The rise in the supply of highly skilled immigrants from Russia not only increased Israel's population by 11%, but also led to an increase in the wages of high-skilled workers in Israel the same period.
11. It is necessary to develop long run models for immigration effects to explain the counterexamples.

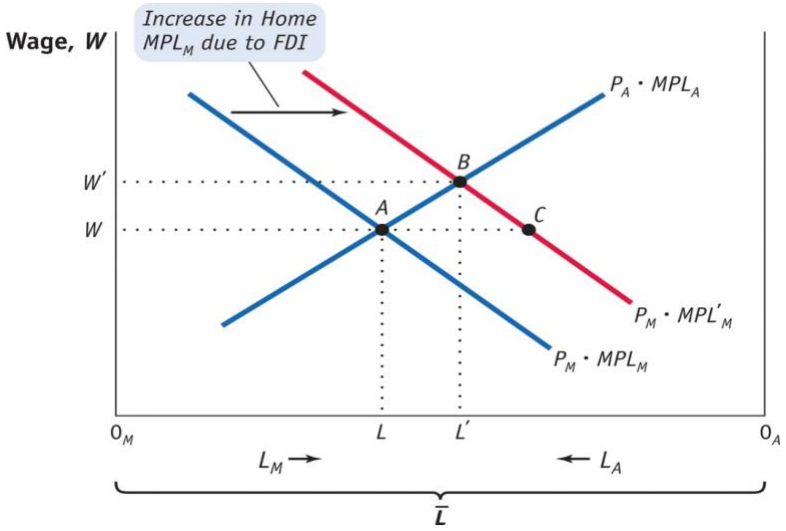
III. Effects of Foreign Direct Investment (FDI) in the Short Run (W'>W, MPL'>MPL & MPK'<MPK)

1. According to the Department of Commerce, if a foreign company acquires 10% or more of a U.S. firm, that is counted as an FDI inflow to the United States, and if a U.S. company acquires 10% or more of a foreign firm, that is counted as an FDI outflow for the United States.
2. Greenfield investment (FDI): a foreign company builds a plant in the host country.
3. Brownfield investment or acquisition: a foreign company buys an existing plant.
4. Assume FDI favors the manufacturing sector and shifts out the marginal product of labor curve in that sector. M sector, by paying worker higher wage, will attract workers from the A sector.



5. What would happen to the output in both sectors? An FDI inflow and the shift in $P_M \bullet MPL_M$ will cause workers to be pulled out of agriculture, and since there is no change in the amount of land used there, *output of the agriculture industry must fall (from point A to B)*. Since more of both capital and labor are used in manufacturing increases, *output in manufacturing also increases*.

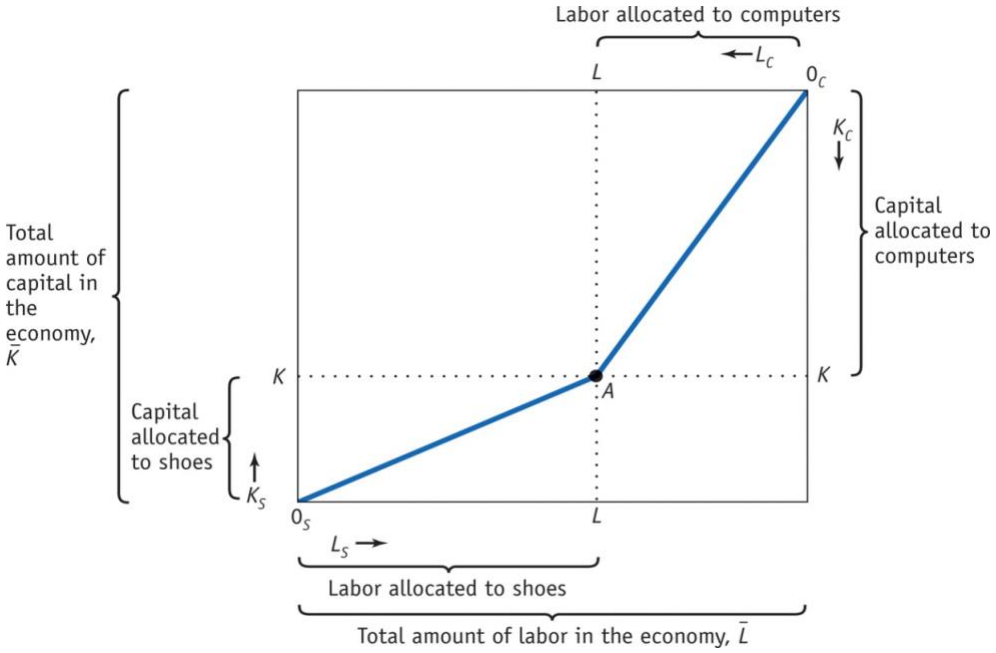
6. What would happen to the nominal and real income to the workers? W/P goes up since W rises.
7. What would happen to the nominal and real income to the manufacturing capitalists? First assume all FDI flows into the M industry. Since FDI reduces MPK but labor inflow increases MPK, it not clear for the net effect. Therefore, we need an auxiliary comparison benchmark.



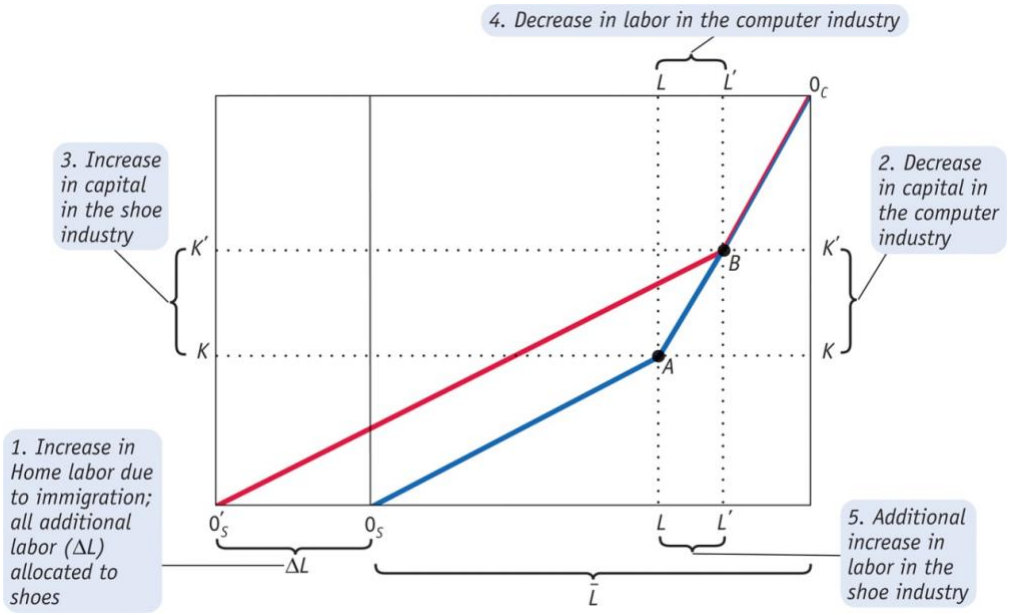
8. If we compare the MPK of point A with that of point C, which is higher? They are the same! Because they pay workers the same wage (W=P*MPL), the MPL is the same at A and C. MPK of A and C is also the same because the only way that the MPL can remain constant is for each worker to have the same amount of capital to work. Then RK should be the same for A and C. (Does this analysis sound like constant return to scale and the Euler theorem of income distribution?)
9. If we compare the MPK of point C with that of point B, which is higher? We can compare the K/L ratio between the two points. Whichever ratio is smaller will have higher MPK. Point C because it employs more labor than B. Thus, MPK at point B is lower than that of point A. By RK=P*MPK, rent at B is also lower than at A. MPK'<MPK and RK'<RK. (Too complicated, right? Try this intuition: more supply, lower price.)
10. What would happen to the nominal and real income to the landlords in the agricultural sector? MPT falls as workers flow out of the industry. With an inflow of FDI, fewer workers are employed in agriculture, and each acre of land cannot be used as intensively. The value of marginal product of land, MPT=RT/PA, falls. If MPT falls and PA remains unchanged, then land rental must fall.
11. What if Pm goes up? What if FDI flows into the A sector? What if FDI flows into both industries?

IV. Effects of Immigration in the Long Run (labor-intensive industry expands while the other contracts.)

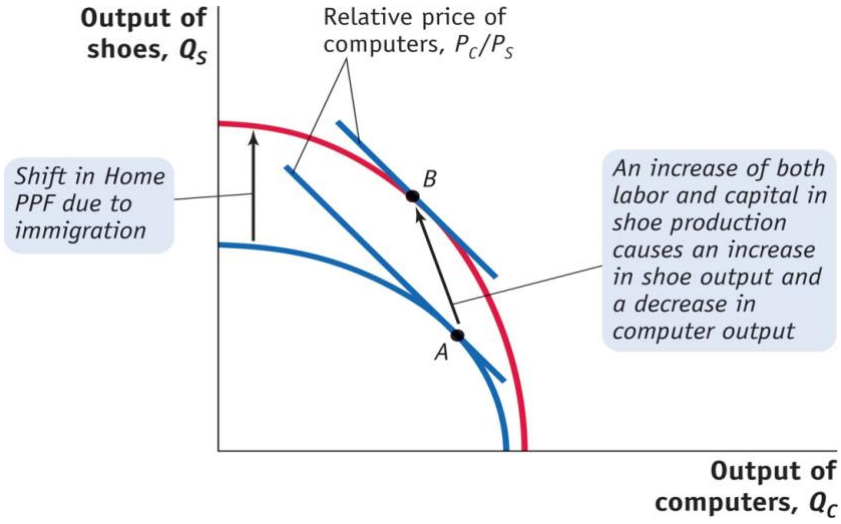
1. Edgeworth box for resource allocation. Point A represents the proportion of inputs allocated in two industries. Shoe production is labor intensive while the computer industry is capital intensive.



2. In the long run, industry outputs adjust so that the capital–labor ratios in each industry at point *B* (the slopes of 0_SB and 0_CB) are unchanged from the initial equilibrium at point *A* (the slopes of 0_SA and 0_CA). To achieve this outcome, all new labor resulting from immigration is allocated to the shoe industry, and capital and *additional* labor are transferred from computers to shoes, keeping the capital–labor ratio in both industries unchanged.

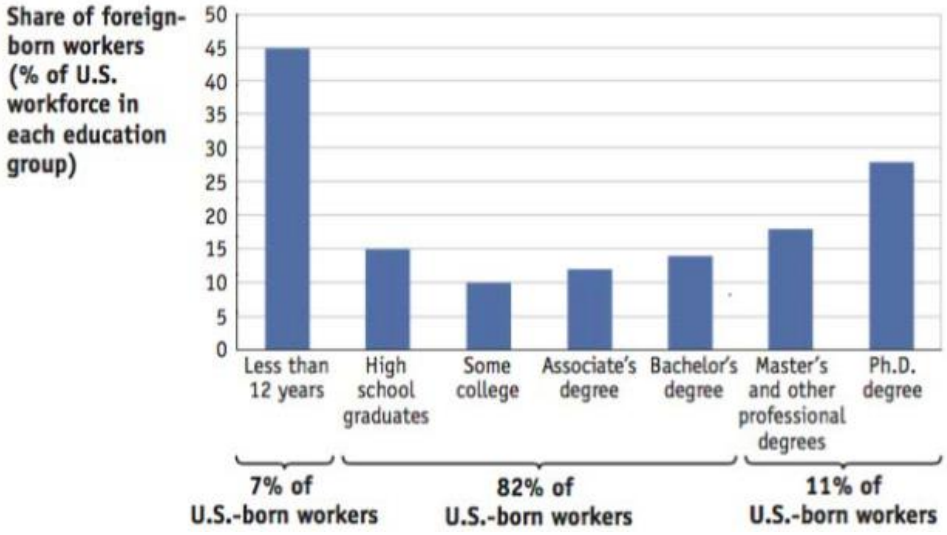


3. The finding that an increase in labor will expand one industry but contract the other holds only in the long run; in the short run, as we saw, both industries will expand as a result of immigration.



4. Furthermore, the labor-intensive industry will also absorb additional capital and labor from the capital-intensive industry, so its capital–labor ratio does not change in the long run. Because the capital–labor ratio in each industry does not change, the wage and rentals remain the same as well.

5. Empirical evidence on immigration and U.S. wages
    1) How has immigration to the U.S. affected U.S. wages? From 1980 to 2005, the U.S. experienced more than a doubling of foreign-born people. They amounted to some 6.7% of the population in 1980 and 13% in 2005. By 2013, that percentage had grown to 14.3%.
    2) The bar chart below shows competition with foreigners does occurs. It occurs largely at the bottom and top educational levels, but not where the majority of the U.S.- born workforce resides. That 82% experience very little competition from foreign-born workers.



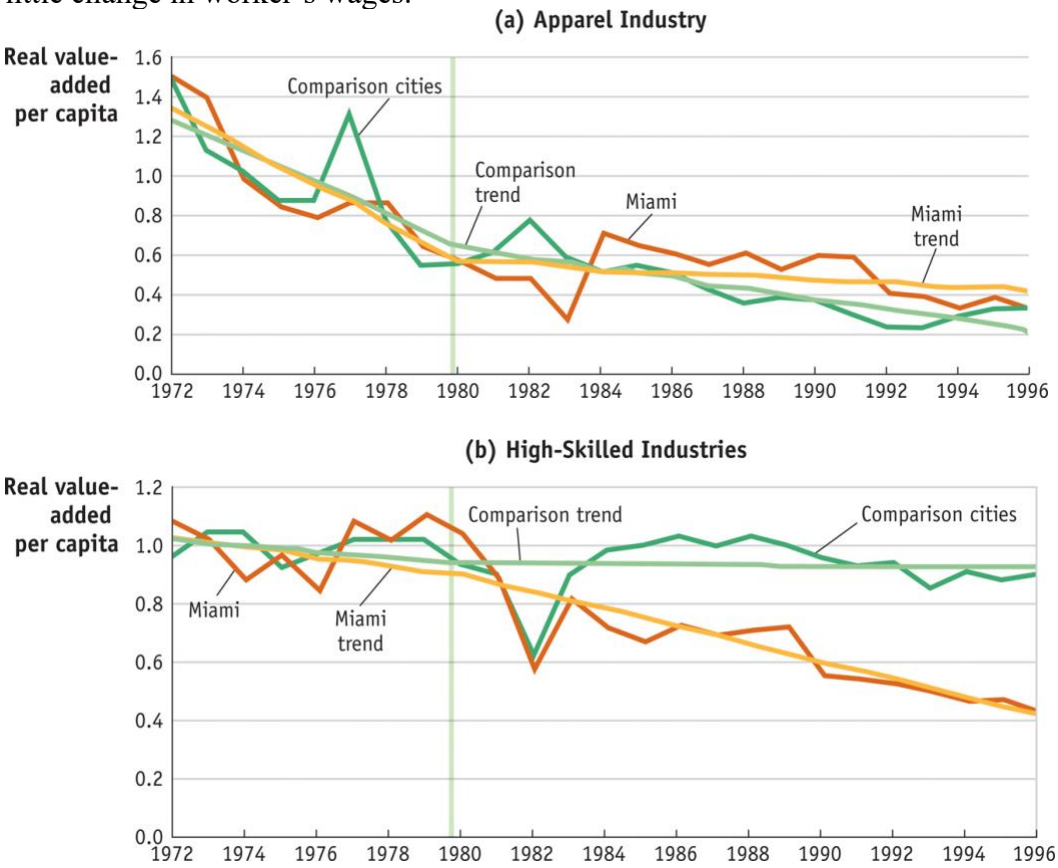
3) Ottaviano and Peri (2012, 2008): From 1990 to 2006, immigration has the greatest impact on workers with very low or high levels of education and only a small impact on those workers with middle levels of education (12 to 15 years).
4) The average U.S. wage growth is nearly constant (+0.1%) in the long run, which supports our long-run model in which wages are shown to be constant after immigration.

	PERCENTAGE CHANGE IN THE WAGE OF WORKERS WITH EDUCATIONAL LEVEL				
	Less Than 12 Years	High School Graduate	Some College	College Graduates	Overall Average
Part A: Effect of Immigration on All U.S. Workers					
Method:					
Short run	−7.8	−2.2	−0.9	−4.7	−3.0
Long run	−4.7	0.9	2.2	−1.7	0.1
Part B: Long-Run Effect of Immigration, by Type of Worker					
Type of Worker:					
U.S. born	0.3	0.4	0.9	0.5	0.6
Foreign born	−4.9	−7.0	−4.0	−8.1	−6.4

Note: Panel A summarizes the estimates from the specific-factors model, assuming that U.S.-born and foreign-born workers are perfect substitutes. Panel B shows long-run estimates (capital adjusts to keep the real rental on capital fixed) when workers are imperfect substitutes.

5) This is fascinating research as it may help to explain the Mariel boatlift of low-skilled Cuban immigrants arriving in Miami. We noted at the beginning of the chapter that these immigrants did not appear to have pulled down the wages of low-skilled workers in Miami. It is easier to explain how this could have possibly occurred using similar reasoning from these data. Perhaps the Cubans competed with each other, lowering their wages, while the low-skilled workers already living in Miami experienced an increase in wages, with the overall impact leaving wages unaffected.
6) Moreover, this research may also help to explain why the immigration of Russian Jews to Israel after 1989 resulted in an increase in wages for some segments of Israeli society. The Russian immigrants were more highly skilled than the existing Israeli population and may not have competed with the Israeli workers and instead competed with each other, lowering the wages for the Russians, while at the same time complementing the activities of the Israeli workers and offering more opportunities for greater specialization, greater productivity, growth in capital, and increasing wages.
7) Ultimately, it appears that one cannot assume immigrants necessarily lower the wages for workers with similar educational backgrounds. Instead, immigrants can raise wages for workers if the two groups are doing jobs that are complementary.

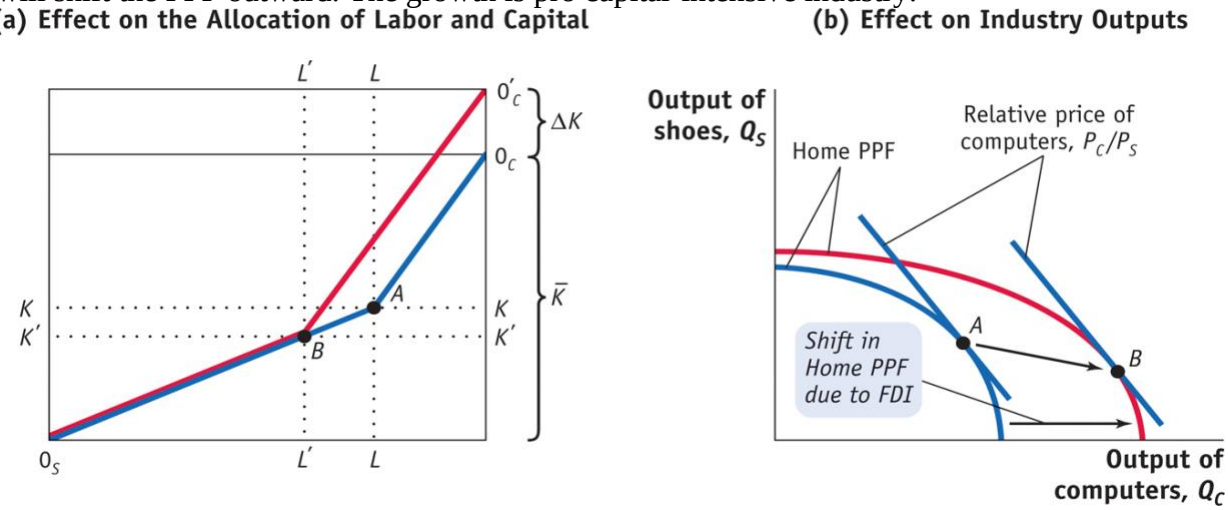
6. Empirical evidence on the effects of the Mariel Boat Lift on industry output in Miami.
    1) Recall that the Cuban refugees arriving in Miami in 1980 were predominately less skilled relative to those in the host city. With the large inflow of unskilled workers, the long run effect should have been an increase in the outputs of the unskilled-labor–intensive industries in Miami and a fall in the production of the skilled-intensive industries, with little change in worker's wages.



    2) With the inflow of refugees from Cuba in 1980, real value-added in the apparel industry in Miami rose from 1983 to 1984, and the trend decline of this industry in Miami was slower (i.e., value-added did not fall as fast) after 1980 than in the comparison cities.
    3) Real value-added (a measure of output) in Miami in high-skilled industries (capital-intensive sector) fell faster after 1980 than in the comparison cities.
    4) Another reason why wages did not change in Miami could be that the city adopted the use of computers more slowly relative to the rest of the country during the period of "skill-biased technological change."
    5) Although the national trend led to an increase in the demand for high-skilled workers and a reduction in the employment of low-skilled workers in the 1980s, many industries in Miami employed low-skilled workers such as the Mariel refugees instead of moving to computer technologies. Therefore, it is possible that the absorption of the refugees in the apparel industry as well as other industries such as manufacturing and services caused the wage to remain unchanged.

6) In the short run, all industries expand as a result of immigration and wage fall. In the long run, the labor-intensive industry expands but the capital-intensive industry contracts as a result of immigration. Both of these findings are consistent with the **Rybczynski theorem**.

V. Effects of FDI in the Long Run (capital intensive sector will expand while the other will shrink)
Given the assumptions in the H-O model, the increase in the amount of capital at Home from increased FDI will shift the PPF outward. The growth is pro capital-intensive industry.



1. The increase in capital has increased the output of the capital-intensive industry and reduced the output of the labor-intensive industry. This change in output is achieved without a change in the capital labor ratios in either industry.
2. Because capital-labor ratios are unchanged, the wage and the rental on capital are also unchanged. In the long-run model, an inflow of either factor of production will leave factor prices unchanged.
3. Empirical evidence from Singapore: some decline in the rental or the MPK, though not strong.

Real Rental and Wages in Singapore This table shows the growth rate in the real rental and real wages in Singapore, depending on the method used to construct these factor prices. In part A, a production function approach is used to construct the factor prices, and the real rental falls over time because of the growth in capital. As a result, implied productivity growth is negative. In part B, the rental and wages are constructed from data on payments to capital and labor in Singapore, and real wages grow over time, while the real rental either grows or falls slightly. As a result, implied productivity growth is positive.

	ANNUAL GROWTH RATE (%)		
	Real Rental	Real Wages	Implied Productivity
Part A: Using Production Function and Marginal Products			
Period:			
1970–1980	−5.0	2.6	−1.5
1980–1990	−1.9	0.5	−0.7
1970–1990	−3.4	1.6	−1.1
Part B: Using Calculated Rental and Actual Wages			
Interest Rate Used and Period:			
Bank lending rate (1968–1990)	1.6	2.7	2.2
Return on equity (1971–1990)	−0.2	3.2	1.5
Earnings-price ratio (1973–1990)	−0.5	3.6	1.6

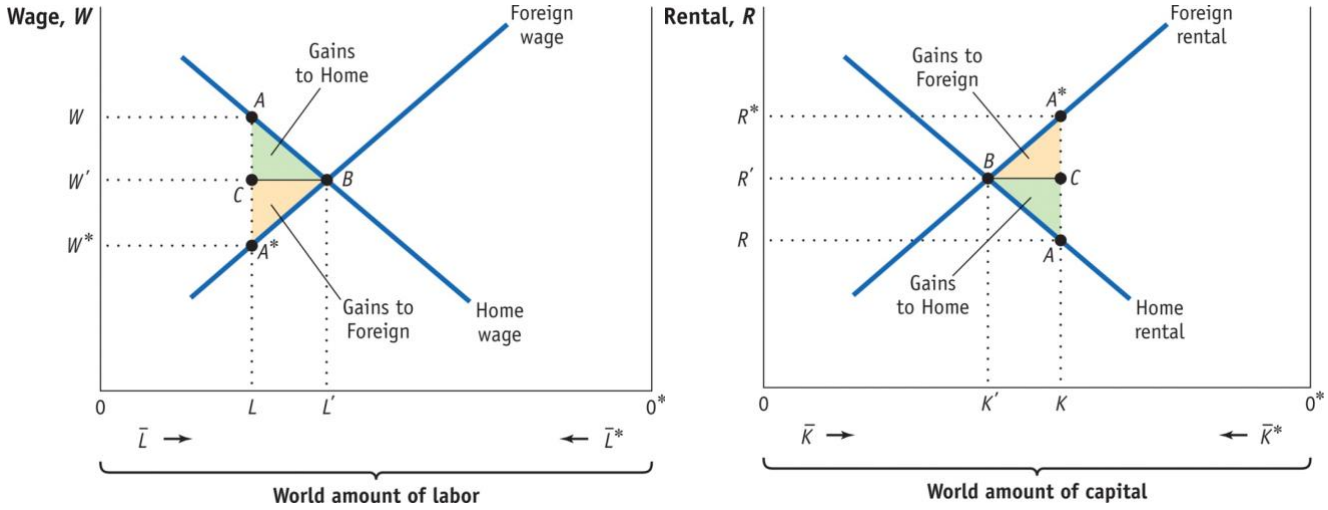
Sources: Part A from Alwyn Young, 1995, "The Tyranny of Numbers: Confronting the Statistical Realities of the East Asian Growth Experience," Quarterly Journal of Economics, 110(3), August, 641–680. Part B from Chang-Tai Hsieh, 2002, "What Explains the Industrial Revolution in East Asia? Evidence from the Factor Markets," American Economic Review, 92(3), 502–526.

VI. International Factor Movement Theorem

1. **Rybczynski Theorem**: an increase in the amount of a factor in an economy will increase the output of the industry using that factor intensively and decrease the output the other industry.
2. **Factor price insensitivity theorem** states that in the H–O model with two goods and two factors, an increase in the amount of a factor found in an economy can be absorbed by changing the outputs of the industries, without any change in the factor prices.
3. Regarding the long run effects of immigration and FDI on domestic prices, keep in mind that prices adjust to international trade but not international factor movements, which is due to factor quantities adjustment to international factor movements.

VII. Welfare Gains of International Factor Movement

1. Host country (capital abundant): as labor flows in, wage will fall. How to measure this welfare gain in the graph? Who are the major gainers? How about the foreign country?



2. FDI to foreign country (capital scarce): as capital flows in, rental will fall. How to measure this welfare gain in the graph? How about the home country?

Country	Remittances Received ($ millions)	Net Aid Received ($ millions)
Albania	1,094	298
Bangladesh	13,857	2,669
Brazil	2,537	1,150
Colombia	4,450	852
Croatia	1,497	280
Dominican Republic	4,486	148
India	69,970	2,436
Mexico	23,022	561
Morocco	6,882	1,966
Sudan	424	1,163
Vietnam	8,000*	4,085

3. Both immigration and FDI create world gains as labor and capital move from countries with low marginal products to countries with high marginal products, provided that the income of the emigrants is included in the source country's welfare.

	AMOUNT OF IMMIGRATION	
	Percent of Home labor	**Increase in GDP (%)**
Part A: Calculation of Home Gains		
Study used:		
Borjas (1995, 1999), U.S. gains	10	0.1–0.4
Kremer and Watt (2006), Household workers	7	1.2–1.4
Peri, Shih, and Sparber (2013)	(24% of STEM workers*)	4.0
Part B: Calculation of Regional Gains		
Study used:		
Walmsley and Winters (2005),		
From developed to developing countries	3	0.6
Klein and Ventura (2009),		
Enlargement of the European Union†		
After 10 years	0.8–1.8	0.2–0.7
After 25 years	2.5–5.0	0.6–1.8
After 50 years	4.8–8.8	1.7–4.5
Common Labor Market in NAFTA†		
After 10 years	1.0–2.4	0.1–0.4
After 25 years	2.8–5.5	0.4–1.0
After 50 years	4.4–9.1	1.3–3.0

Readings

20190416 Mapping the Global Migration of Millionaires
https://www.visualcapitalist.com/global-migration-of-millionaires/

20181228 Animation: 200 Years of U.S. Immigration As Tree Rings
https://www.visualcapitalist.com/200-years-u-s-immigration/

20180518 Visualizing Two Centuries of U.S. Immigration
https://www.visualcapitalist.com/two-centuries-of-immigration/

201805 Has migration gone too far? | The Economist 2:56
https://www.youtube.com/watch?v=xt-e8JQZmqw

201812 How does immigration impact the economy? | CNBC Explains 6:20
https://www.youtube.com/watch?v=f0dVfDiSrFo

Brookings Podcast: 20181102 The facts about the 'migrant caravan'
https://www.brookings.edu/podcast-episode/the-facts-about-the-migrant-caravan/