

EC3355: International Trade

Specific factors model

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Last week

- ▶ Comparative advantage
 - ▶ Production of goods at relatively lower opportunity costs
 - ▶ Differences in technology makes that there are potential gains from free trade
- ▶ Ricardian model
 - ▶ Countries focus on exporting good in which it has a comparative advantage
 - ▶ Under free trade equilibrium countries will specialise
 - ▶ Free trade will weakly benefit all participants even if some countries are terrible at everything
 - ▶ All workers gain since all income goes to labour

Last week

Shortcomings of the Ricardian model

1. Predicted specialisation rarely happens
2. Everyone is expected to benefit from trade as there is only one production factor

Today

- ▶ Factor proportion theory
- ▶ Costs and benefits of trade
- ▶ Specific factors model
- ▶ Wages and prices
- ▶ Opening to international trade
- ▶ International trade and labour

Factor proportion theory

- ▶ Law of comparative advantage establishes relationship between relative autarky prices and trade flows
- ▶ Unclear where the relative autarky prices come from
- ▶ Factor proportion theory focuses on factor endowment differences

Factor proportion theory

1. Countries differ in terms of factor abundance (relative factor supply)
 2. Countries differ in terms of factor intensity (relative factor demand)
- ▶ Interaction between 1 and 2 determines relative autarky prices and patterns of trade

Costs and benefits of trade

Trade hurts, sometimes

- ▶ Ricardian model predicts benefits for all
- ▶ Ignores effect of within-country income distribution
- ▶ Two reasons why trade affects income:
 1. Industries differ in the factors of productions that they use
 - ▶ Stolper-Samuelson Theorem
 2. Production factors cannot move instantaneously and without costs between industries

Costs and benefits of trade

Stolper-Samuelson theorem (briefly)

- ▶ Under constant returns to scale, an increase in the price of a commodity will increase the return to the factor used intensively and decrease the return to the other factor
- ▶ Will discuss this in more detail next lecture

Costs and benefits of trade

Costs associated with opening up to trade

1. Short run: adjustment costs
2. Long run: decrease in the requirement of certain production factors

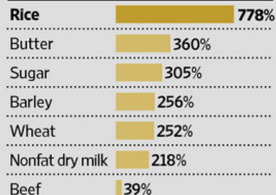
Cost and benefits of trade

Farm protection in Japan (*Source: The Wall Street Journal*)

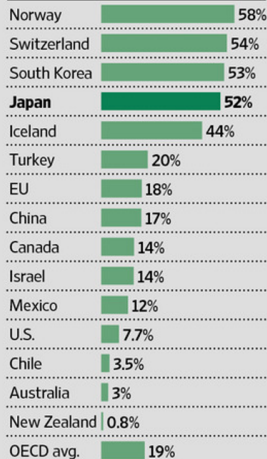
Farm Protections

Japan's long-standing tradition of protecting its farmers is coming under criticism from some farmers, who say it has stymied efforts to bring more competition to agriculture.

Japan tariffs on certain farm goods, end of March 2012



Subsidies as a percentage of farm income, for 2011*



*China figure is from 2010

Sources: Ministry of Agriculture, Japan (tariffs); OECD (subsidies)

The Wall Street Journal

Costs and benefits of trade

Farm protection in Japan

- ▶ Japan's tariffs allow very little rice to be imported
- ▶ An exporter must be 778 USD to export 100 USD worth of rice
- ▶ Land scarcity means producing rice is expensive in Japan, especially compared to other countries

Costs and benefits of trade

Farm protection in Japan

- ▶ Japan as a whole would be better off allowing rice imports
- ▶ Japanese farmers would be hurt
 - ▶ Farmers could work elsewhere, such as the Toyota factory
 - ▶ Farming skills would be useless in factory however
 - ▶ In the short-run farmers can't move to working in factory

Costs and benefits of trade

Specific factors in production

- ▶ Opposition to trade due to effects on income
- ▶ Specific factors model allows trade to affect income distribution

Specific factors model

Trade in specific factors model

- ▶ Same technology in all countries
- ▶ Countries have a different factor mix
- ▶ Differences in factor mix causes countries to specialise
 - ▶ E.g. More labour makes textiles, more capital makes nuclear boilers

Specific factors model

Basic model

- ▶ Two countries: Home and Foreign
- ▶ Two goods: *cloth* and *food*
- ▶ Three production factors: labour L , capital K , land T

Specific factors model

Production

- ▶ *Cloth* produced using capital and labour, but not land

$$Q_c = Q_c(K, L_c)$$

- ▶ *Food* produced using land and labour, but not capital

$$Q_f = Q_f(T, L_f)$$

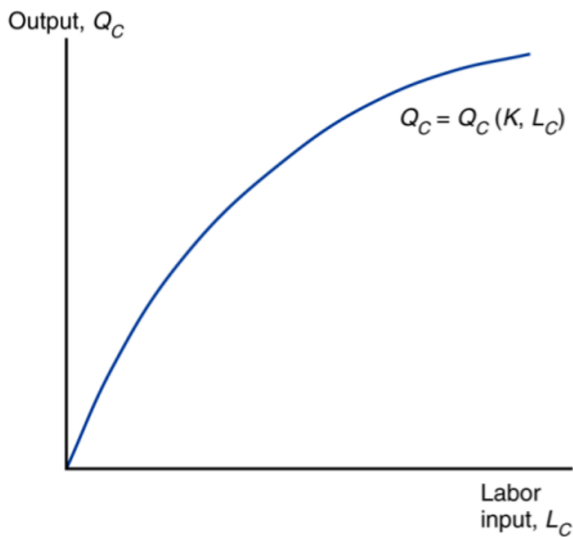
- ▶ Labour is mobile between two sectors

$$L = L_c + L_f$$

- ▶ Land and capital are specific factors, used only in production of one good

Specific factors model

Production function for cloth



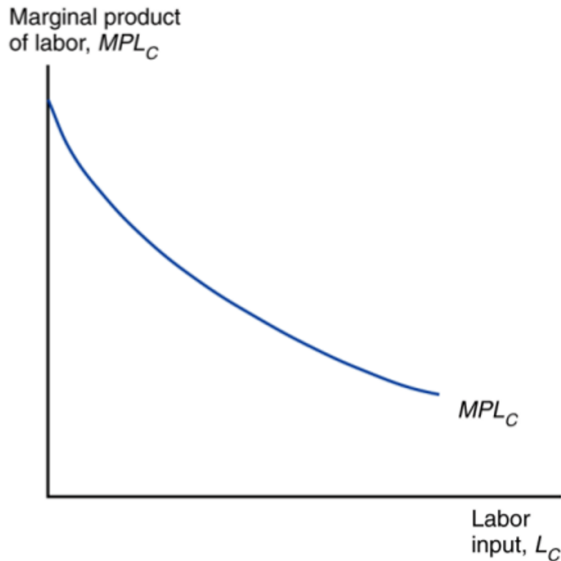
Specific factors model

Law of diminishing returns

- ▶ One worker added to production process, amount of capital remains the same
- ▶ Each worker has less capital to work with
- ▶ Each additional unit of labour add less output than the last

Specific factors model

Marginal product of labour



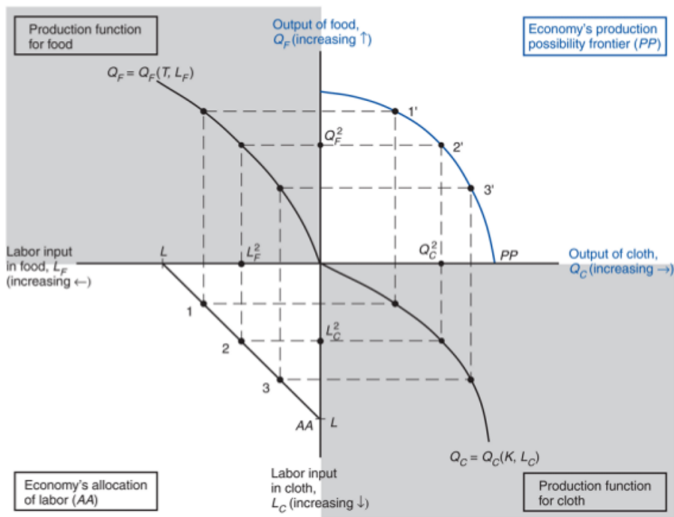
Specific factors model

Production possibilities frontier

- ▶ Can use four-quadrant diagram to construct production possibilities frontier
 - ▶ Lower left indicates allocation of labour
 - ▶ Lower right shows production function of cloth
 - ▶ Upper left shows production function for food
 - ▶ Upper right indicates combination of cloth and food that can be produced

Specific factors model

Production possibilities frontier



Specific factors model

Production possibilities frontier

- Slope is given by

$$-\frac{Q_L^F(T, L_F)}{Q_L^C(K, L_C)} = -\frac{MPL_F}{MPL_C}$$

- Amount of food foregone to produce more clothing
- Diminishing returns to labour in each sector cause the opportunity cost to rise when an economy produces more of a good

Specific factors model

Production possibilities frontier

- ▶ Similar to last week the PPF describes which output the economy can generate
- ▶ Question that remain are:
 1. Which goods does the economy produce under autarky?
 2. Which goods will be produced after opening up to trade?

Wages and prices

Determination of wages

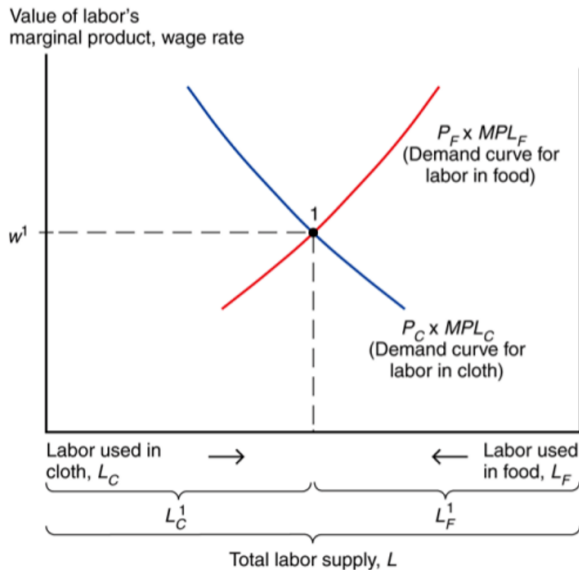
- ▶ For each sector wage will equal the marginal product of labour
- ▶ Both sectors pay same wage due to labour mobility

$$MPL_C * P_c = MPL_F * P_f = w$$

$$-\frac{P_c}{P_f} = -\frac{MPL_F}{MPL_C}$$

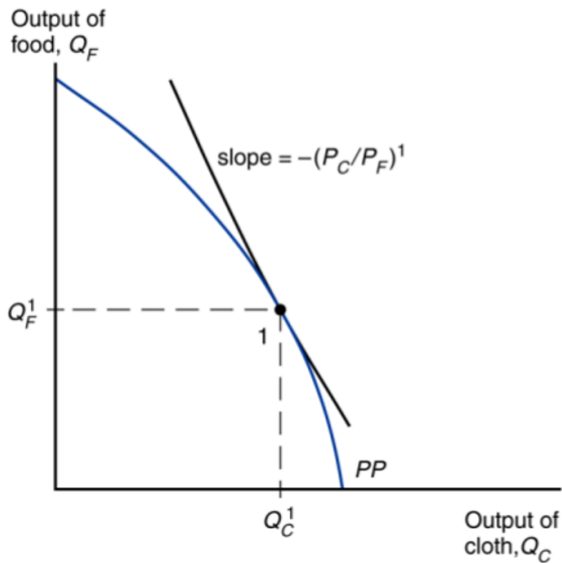
Wages and prices

Labour allocation in autarky



Wages and prices

Production function



Wages and prices

Determining payment to capital and land

- ▶ Capital and land earn what is left over from sales revenue ($p * Q$) after labour is paid ($w * L$)

$$r_K = \frac{p_c * Q_c - w * L_c}{K}$$

$$r_T = \frac{p_f * Q_f - w * L_f}{T}$$

Wages and prices

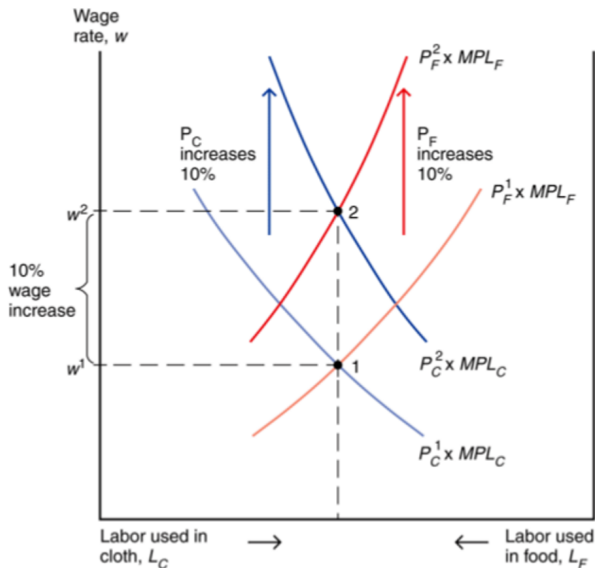
Effect of change in prices

What happens to labour allocation and income distribution when there is a

1. change of prices in equal proportions
2. change in relative prices

Wages and prices

Equal proportional change in prices: labour allocation and wages



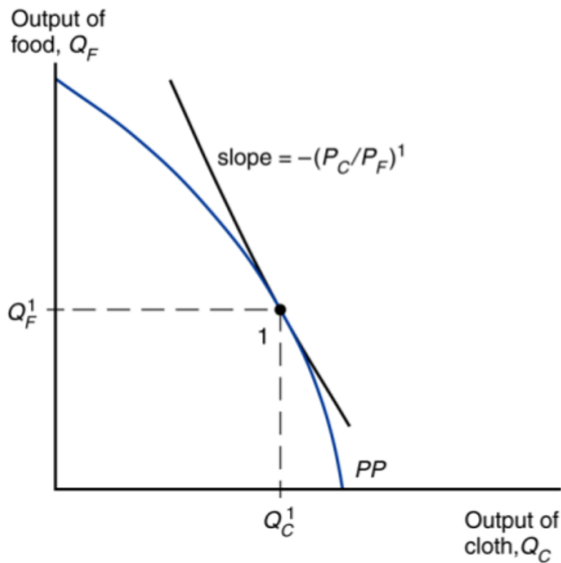
Change in prices

Equal proportional change in prices

- ▶ No real changes occur
- ▶ w rises in the same proportion, real wages are unaffected
- ▶ Real incomes of capital owners and landowners stays the same

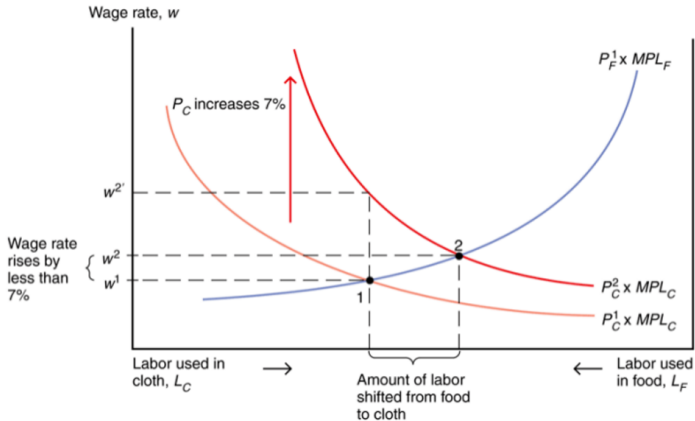
Wages and prices

Equal proportional change in prices: production



Change in prices

Increase in price of cloth



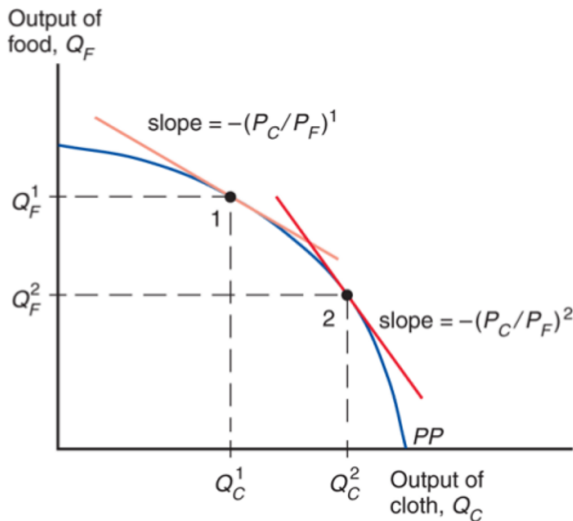
Change in prices

Change in relative prices

- ▶ When p changes in one sector, labour shifts to sector with higher price, output in other sector falls
- ▶ w does not rise as much as p_c since marginal product of labour will fall

Change in prices

Effect of price change for cloth on output



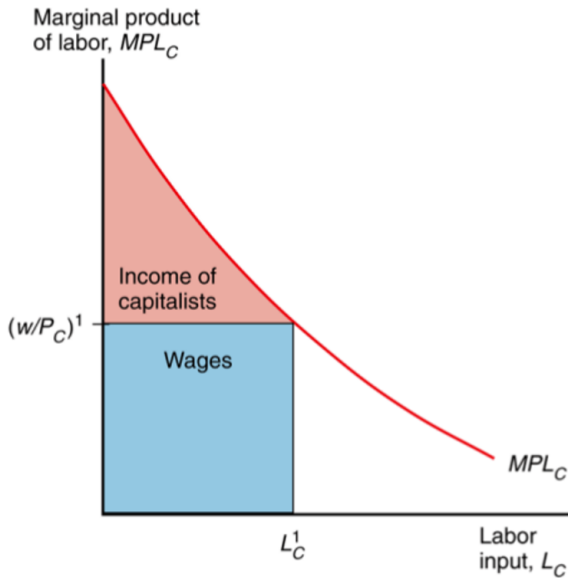
Change in prices

Effect of price change in cloth on income

1. Capital owners are better off due to the positive price shock in capital intensive sector
 - ▶ r_K goes up, marginal product of K is expected to increase
2. Landowners are worse off since since land is not a production factor in cloth industry
 - ▶ r_T goes down, marginal product of T is expected to decrease
3. Cannot say if workers are better or worse off, depends on relative importance of cloth and food in consumption
 - ▶ Wages increase but so does price on textiles
 - ▶ Can afford more food but less clothes

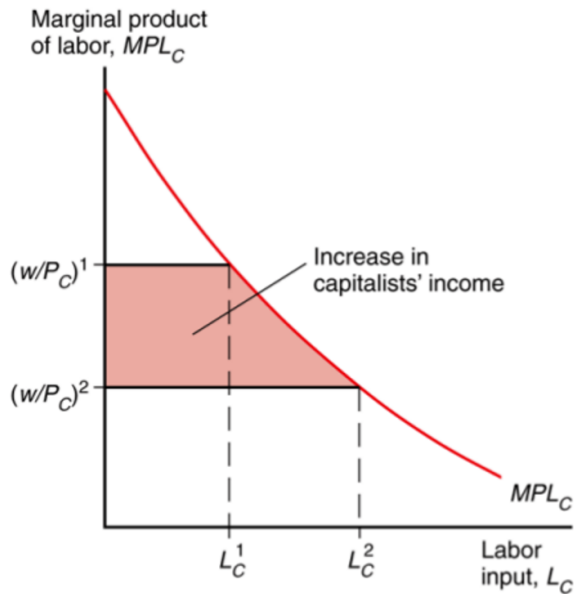
Changes in prices

Income distribution in the cloth sector



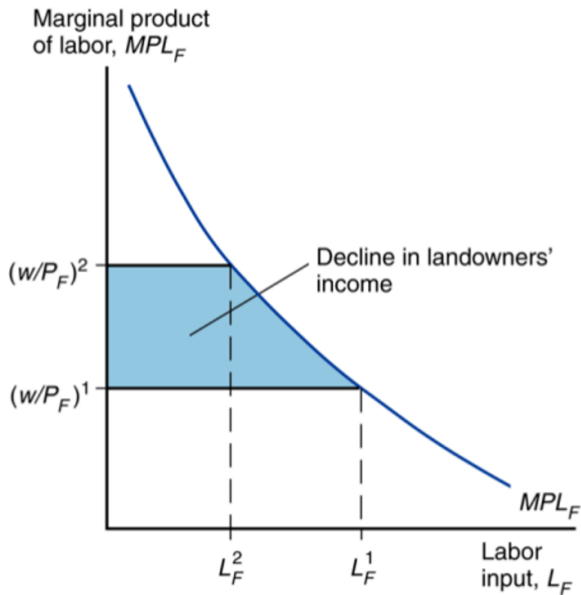
Changes in prices

Rise in cloth price benefits capital owners



Changes in prices

Rise in cloth price hurts landowners



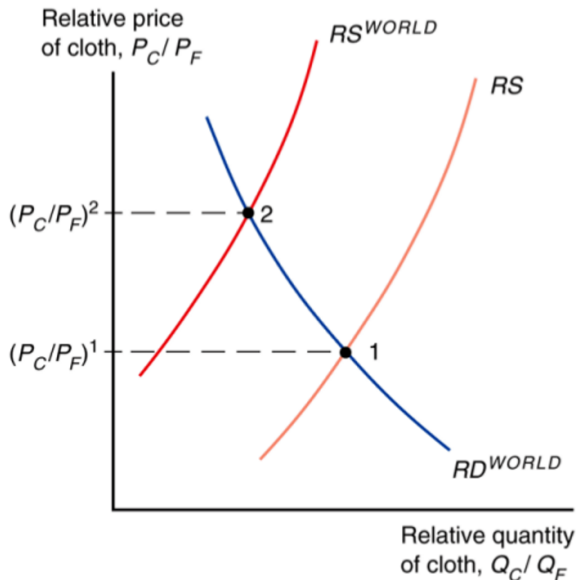
Opening to international trade

Trade pattern

- ▶ Opening up to trade is as a change in relative prices
- ▶ Direction of change depends on economy's relative demand and supply and world's relative demand and supply
- ▶ Opening up to trade increases the relative price of cloth in an economy whose relative supply of cloth is larger than for the world as a whole

Opening to international trade

Relative prices under international trade



Opening to international trade

Gains from trade

- ▶ Without trade economy's output must equal its consumption
- ▶ Int. trade allows mix of consumption to differ from mix produced
- ▶ Country cannot spend more than it earns:
$$P_C * D_C + P_F * D_F = P_C * Q_C + P_F * Q_F$$
- ▶ Imports an amount of food equal to the relative price of cloth times the amount of cloth exported:
$$D_F - Q_F = \frac{P_C}{P_F} * (Q_C - D_C)$$
- ▶ It is able to afford amounts of cloth and food that the country is not able to produce itself

Opening to international trade

Effect on income distribution

- ▶ Factor prices change as a result of trade
- ▶ Trade benefits factor that is specific to the export sector of the country
- ▶ Trade hurts factor that is specific to the import-competing sector
- ▶ Effect on mobile factor is ambiguous

Opening to international trade

Welfare effects

- ▶ Trade benefits country as it expands consumption possibilities
- ▶ Trade creates both winners and losers
- ▶ Possible to redistribute income to compensate losers

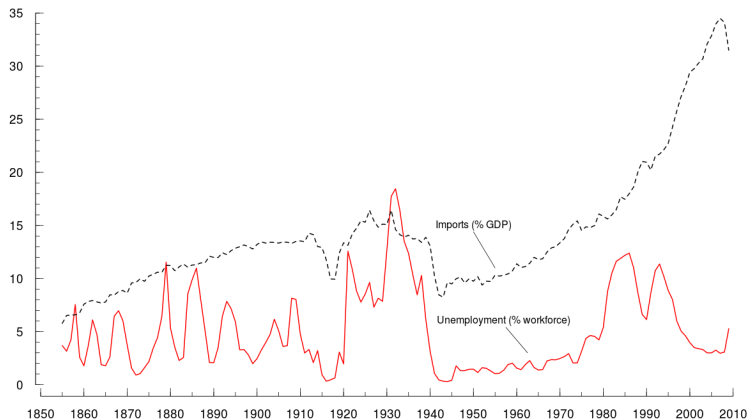
International trade and labour

Unemployment

- ▶ Opening to trade will shift jobs from import-competing to export sector
- ▶ Process not instantaneous and some will be left unemployed
- ▶ No strong correlation between unemployment and trade

International trade and labour

Unemployment and import penetration in the UK



International trade and labour

Factor movement

- ▶ Movement of factors of production include:
 1. Labour migration
 2. International borrowing and lending
 3. Foreign direct investment
- ▶ Movement of factors of production can be politically sensitive and is often restricted

International trade and labour

Labour mobility

- ▶ Workers migrate wherever wages are highest
- ▶ Consider movement of workers across countries rather than sectors
- ▶ Suppose two countries produce one non-traded good using two factors of production
 1. Land, fixed factor
 2. Labour, can move across countries

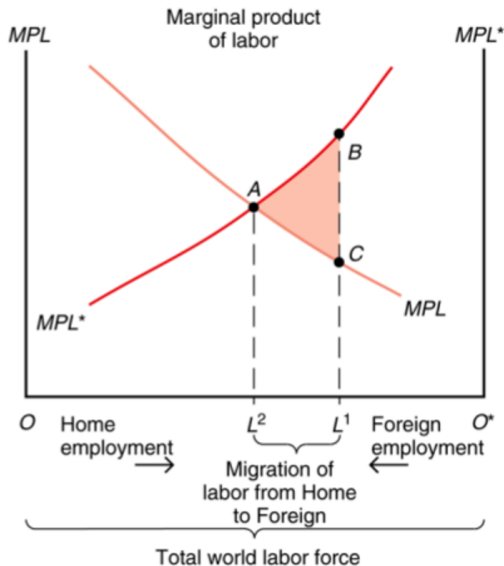
International trade and labour

Labour mobility

- ▶ Home workers earn lower real wage than in Foreign
 - ▶ Lower wage due to lower productivity (less land per worker)
- ▶ Workers from Home want to migrate to Foreign where they can earn more
- ▶ Without obstacles, workers move from Home to Foreign until purchasing power of wages is equal across countries
- ▶ In real life wages don't equalise due to barriers to migration

International trade and labour

Labour mobility



International trade and labour

Welfare effects of labour migration

- ▶ Migration increases world output because labour moves where it is more productive
- ▶ Value of world output is maximized when the marginal productivity of labour is the same across countries
- ▶ Workers in Home will initially benefit, workers in Foreign are hurt
- ▶ Landowners in Foreign benefit by inflow of labour, decreasing real wages and increasing output
- ▶ Landowners in Home are hurt by outflow of labour, increasing real wages and decreasing output

International trade and labour

Real wages in origin and destination countries

Source: *Williamson, 1995*

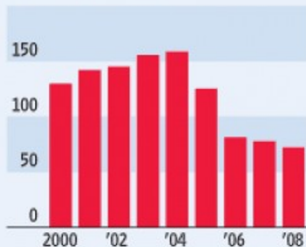
	Real wage 1870, US=100	Increase real wages 1870-193 (%)
<i>Destination countries</i>		
Argentina	53	51
Australia	110	1
Canada	86	121
United States	100	47
<i>Origin countries</i>		
Ireland	43	84
Italy	23	112
Norway	24	193
Sweden	24	250

International trade and labour

Immigration in Japan (*Source: The Wall Street Journal*)

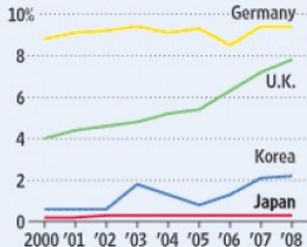
Japan | A closed nation

Inflows of foreign workers into Japan, in thousands



Source: OECD International Migration Outlook 2010

Stocks of foreign-labor force in selected OECD countries, percentage of total labor force



International trade and labour

Mexican migration to US

- ▶ Large share of low-skilled workers in recent immigration increase in the US
- ▶ Mexico is leading country of origin for US immigrants (1/3 of all foreign-born residents)
- ▶ 1 in 10 Mexicans end up living in the US
- ▶ 97% of people leaving Mexico go to US

International trade and labour

Mexican migration to US



International trade and labour

Mexican migration to US

1. Enhanced border protection
 2. Recession decreased job prospects
- ▶ Mexican-US migration fell by 40% between 2006-07 and 2008-09

International trade and labour

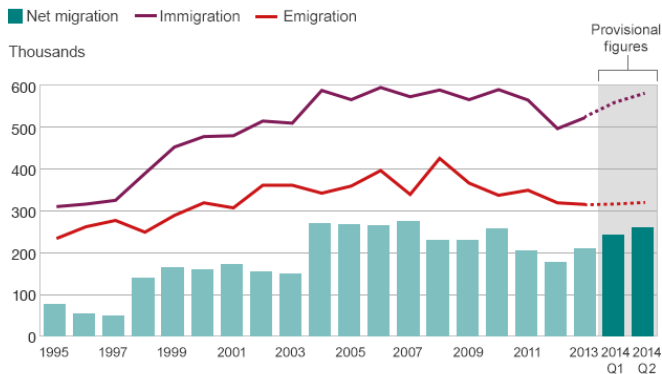
Mexican migration to US

- ▶ Much of Mexican-US migration is cyclical
- ▶ Return rate of Mexicans to US is low (steady at 400-500 thousand)
- ▶ Flow of legal permanent residents is hold steady
- ▶ Fewer new arrivals is driven by unauthorised immigrants

International trade and labour

European migration to UK

Long-term international migration for the UK, 1995 to 2014



Source: ONS

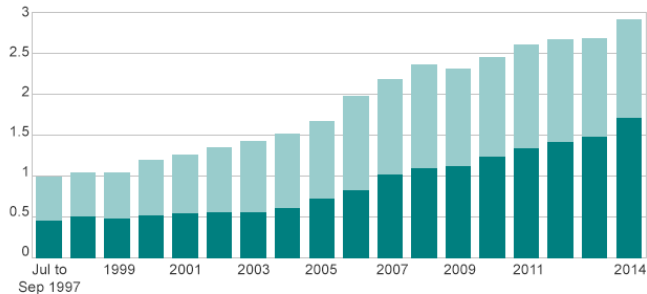
International trade and labour

European migration to UK

EU workers as a proportion of total non-UK workforce

■ EU ■ Non-UK

Millions



Source: Labour Force Survey, November 2014

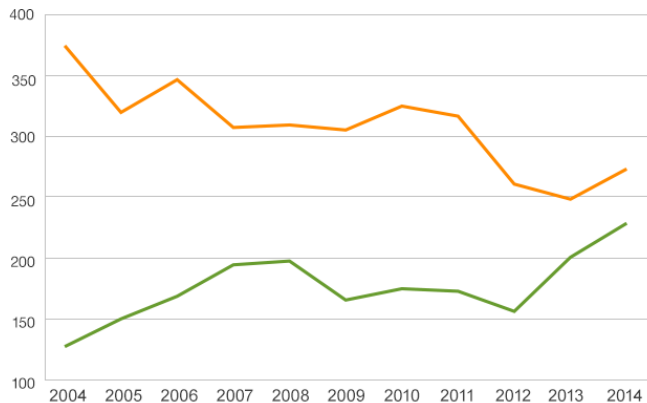
International trade and labour

European migration to UK

EU vs Non-EU migration to the UK

— Immigration from EU — Immigration from rest of world

Thousands



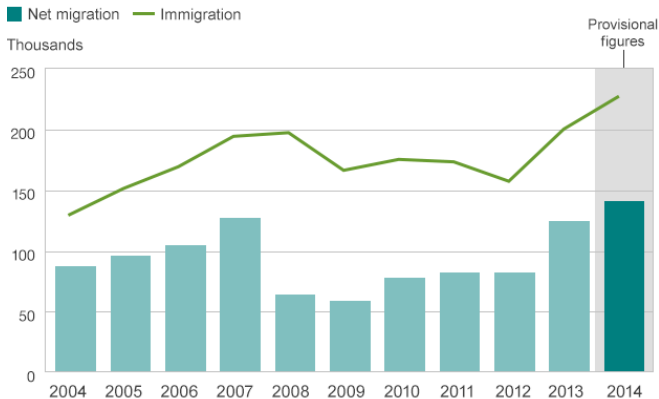
*Excluding British citizens

Source: ONS

International trade and labour

European migration to UK

EU migration to and from the UK*: 2004-2014 Rolling annual figures



*Excluding British citizens

Source: ONS