EC 380: Lecture 3

Trade Theory: The Ricardian Model

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Prologue

Recap

Examined the **closed economy** setting.

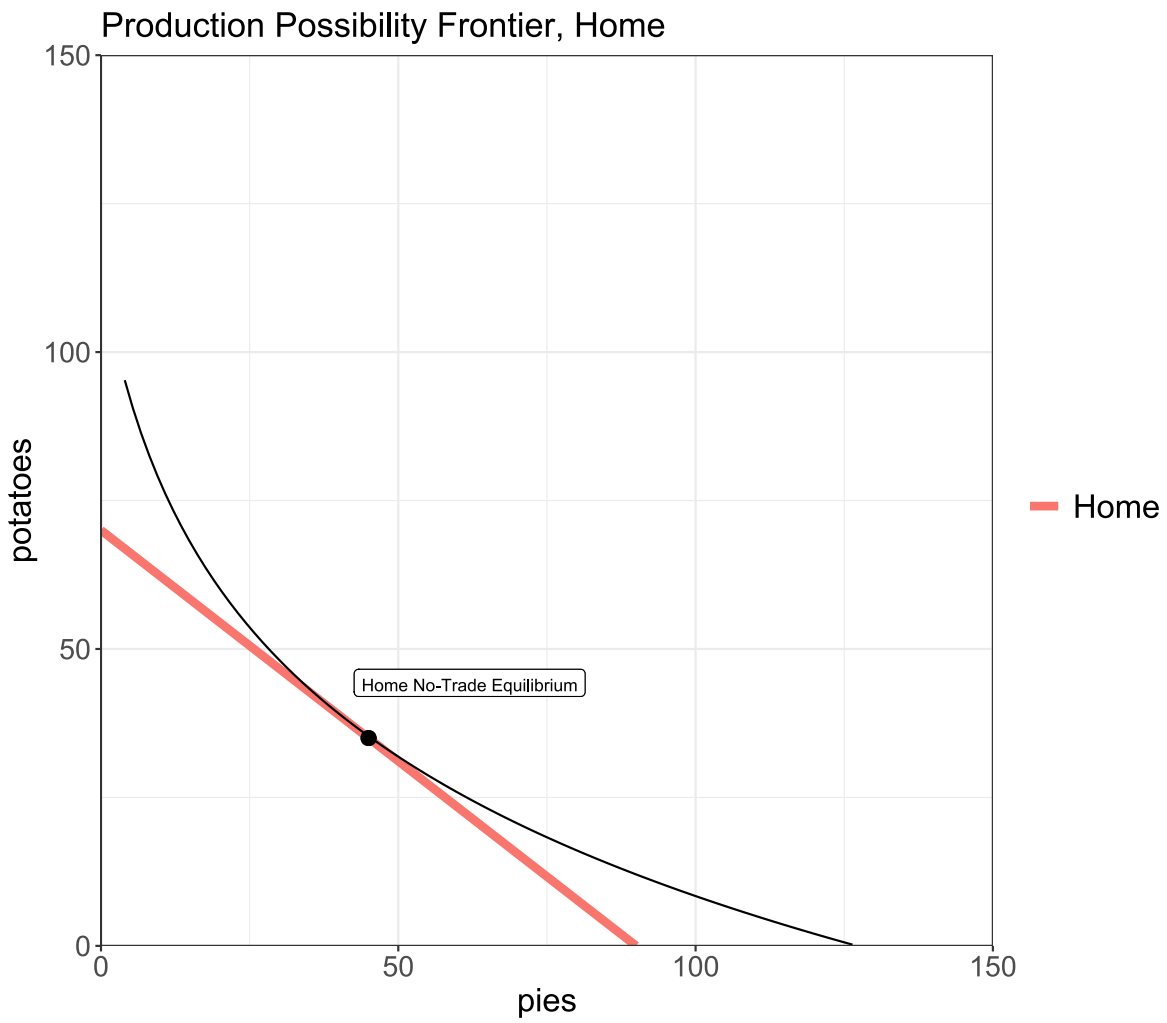
IC of Home's consumers tangent to Home PPF at **(45, 35)**.

IC of Foreign's consumers tangent to Foreign PPF at **(50, 60)**

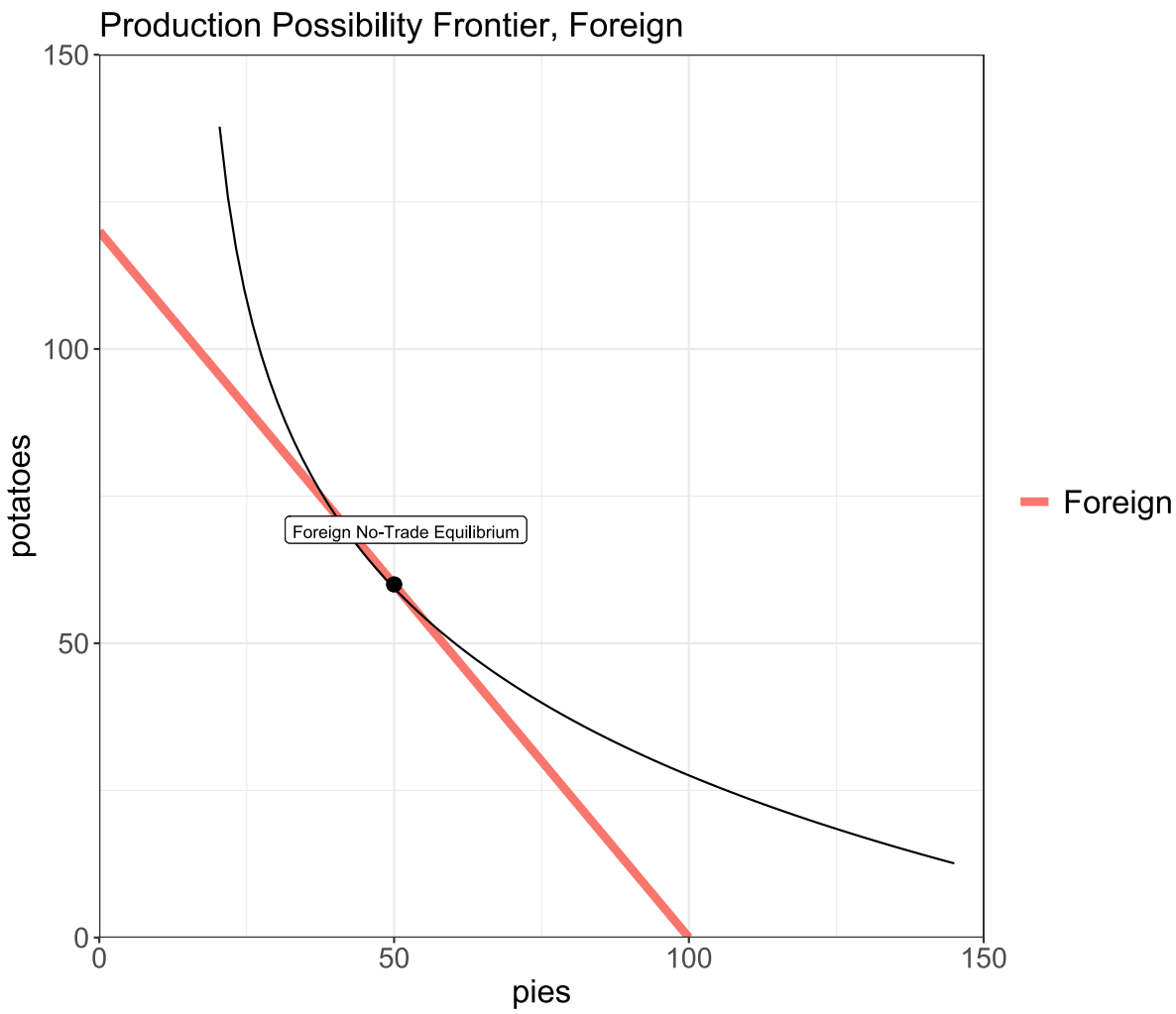
Underlying assumption of **perfectly comptetitive markets** where goods are sold at cost.

Home has **comparative advantage** in producing pies and Foreign has **comparative advantage** in producing potatoes due to **opportunity costs**.

Home Equilibrium



Foreign Equilibrium



Today's Plans

Currently, we have kept both countries closed off.

These countries only consume the bundle of goods that they produce.

From autarky scenario $\Longrightarrow$ free trade. How will **equilibrium outcomes** change?

- What will they produce?
- How much will they consume?
- Do prices change?
- Who benefits from trade under our assumptions?

Free Trade

Country's no-trade relative price $\Longrightarrow$ products it will export/import when trade is opened.

The pattern of exports and imports determined by **opportunity cost** of production in each country, which identifies each country's pattern of **comparative advantage**.

Free Trade Equilibrium

Since **relative price** of pies is $\frac{7}{9}$ at Home but $\frac{12}{10}$ in Foreign, incentive to export Home's pies to Foreign for higher return.

Alternatively, the relative price of potatoes is:

$$\tilde{P}^H_{\text{potato}} = \frac{P^H_{\text{potato}}}{P^H_{\text{pie}}} = \frac{9}{7} > \frac{10}{12} = \frac{P^F_{\text{potato}}}{P^F_{\text{pie}}} = \tilde{P}^F_{\text{potato}}$$

Since potatoes sell better in Home, Foreign producers are incentivized to export to Home.

Ricardo Model predicts **Home exports pies** and **Foreign exports potatoes**.

Free Trade Equilibrium

As Home pies exports $\uparrow$, the local supply $\downarrow$ (more scarce).

Greater Home scarcity $\implies$ higher pie price at Home.

Lower Foreign scarcity $\implies$ lower pie price at Foreign.

Similarly, Foreign exports of potatoes to Home bid price down abroad and up locally.

Changes to exports and imports stop once the relative price of pies is the same in the two countries.

No incentive to deviate from this point $\implies$ equilibrium condition met.

Free Trade Equilibrium

What would the new **world price** of pies look like for Home in this setting?

Measure world capacity to produce potatoes and pies as how much we can produce of either if we put both countries entire workforces towards a single good.

$$\bar{Q}^W_{\text{pie}} = MPL^H_{\text{pie}} * \bar{L} + MPL^F_{\text{pie}} * \bar{L} = 70 + 120 = 190$$

$$\bar{Q}^W_{\text{potato}} = MPL^H_{\text{potato}} * \bar{L} + MPL^F_{\text{potato}} * \bar{L} = 90 + 100 = 190$$

Since **world PPF's** slope is line between these two "max" production points, and that **slope is -1**, this implies the **world price would be 1**.

The **free-trade price** of pies 1 is greater than the **autarky price** of $\frac{7}{9}$.

Free Trade Equilibrum

World price greater than **opportunity cost** of producing pies at Home.

Home producers shift labor to producing more pies.

How much labor will get shifted?

Free Trade Wages

Wages at Home

$W^H_{\text{pie}} = MPL^H_{\text{pie}} * P^H_{\text{pie}}$ and $W^H_{\text{potato}} = MPL^H_{\text{potato}} * P^H_{\text{potato}}$

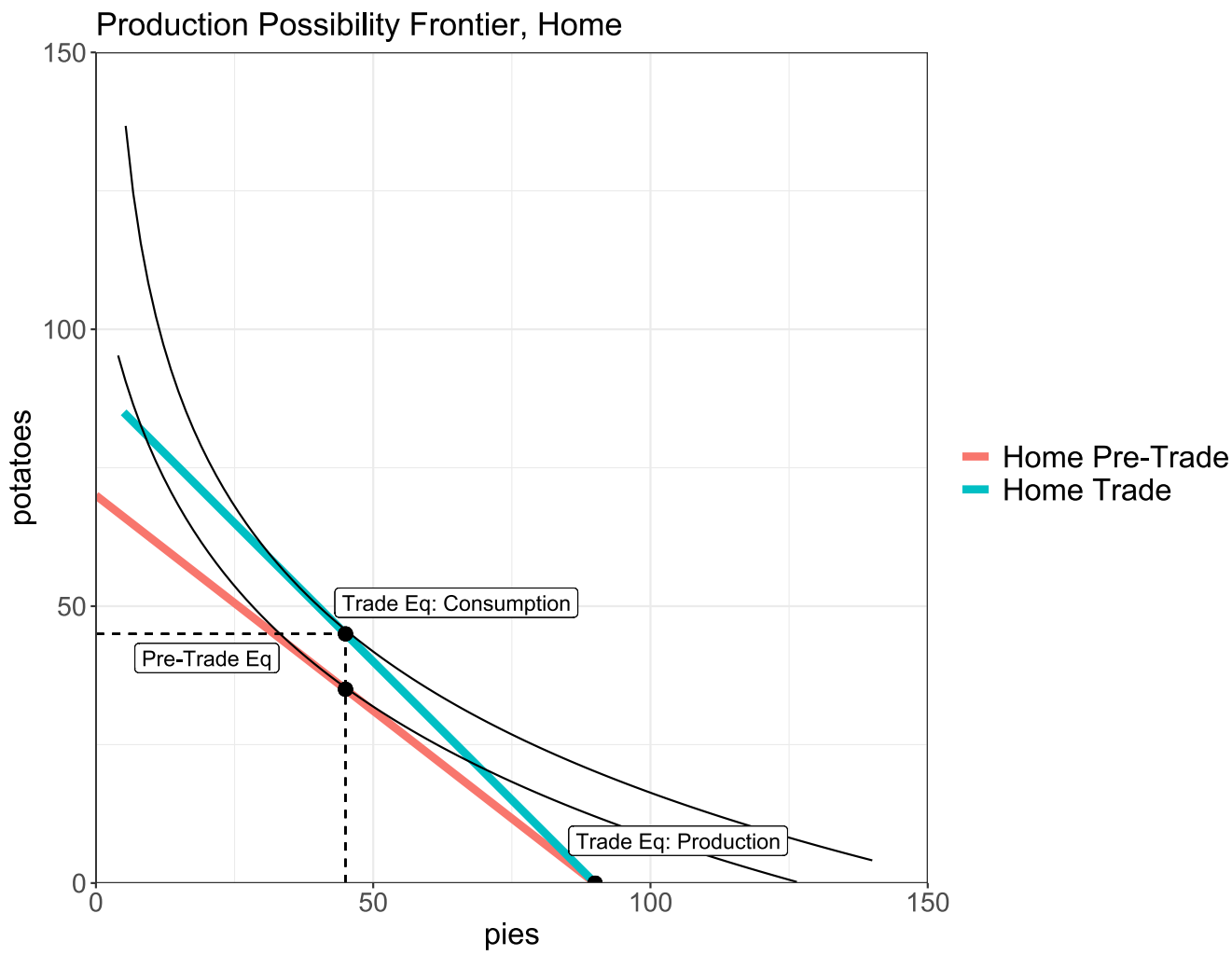
Recall that under trade $\frac{P^H_{\text{pie}}}{P^H_{\text{potato}}} = 1$, $MPL^H_{\text{pie}} = 9$ and $MPL^H_{\text{potato}} = 7$.

Wage Ratio: $\frac{P^H_{\text{pie}} * MPL^H_{\text{pie}}}{P^H_{\text{potato}} * MPL^H_{\text{potato}}} = 1 * \frac{9}{7} = \frac{9}{7}$.

Implies wages are higher working in pies than in potatoes.

All Home workers go work in the pie industry.

Free Trade Equilibrium: Home



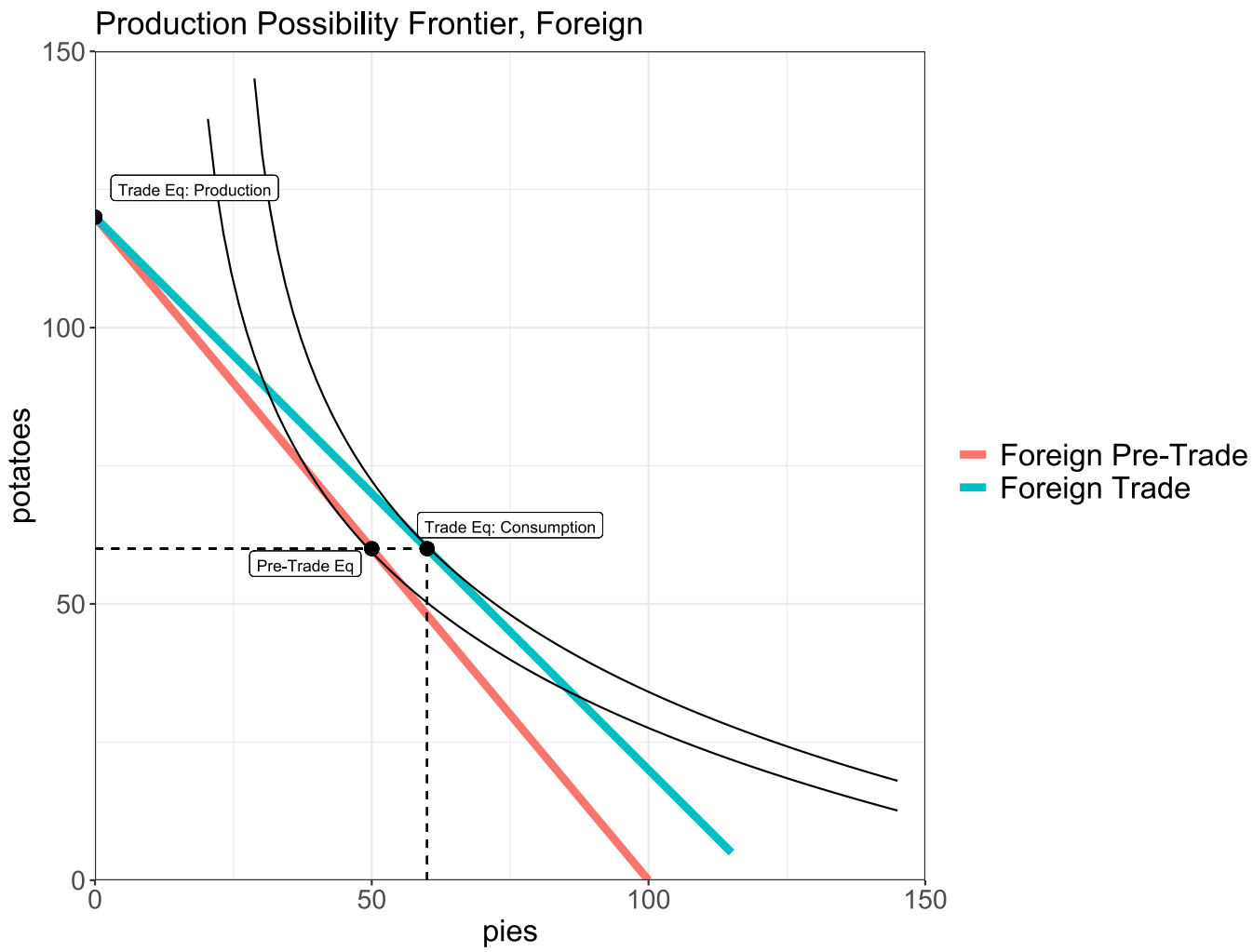
Free Trade Equilibrium: Home

Home produces 90 pies and 0 potatoes, yet we see it is consuming 45 of each.

This implies 45 pies are exported to foreign and in return, 45 potatoes imported from Foreign.

How does the relative price change affect Foreign?

Free Trade Equilibrium: Foreign



Free Trade Outcome

Trade Eq. - Production Bundles

Country	Pie	Potato
Home	90	0
Foreign	0	120

Trade Eq. - Consump. Bundles

Country	Pie	Potato
Home	45	45
Foreign	60	60

The introduction of trade is **welfare enhancing** for both countries.

This is evident from both countries consumption equilibria shifting to a higher indifference curves.

Difference between consumption and production due to trade.

Free Trade: Wages

So far we have learnt that there are **gains from trade** and **trade flows are determined by comparative advantage**.

While prices converged, wages do not.

Wage levels differ across countries with trade, and wages are determined by absolute advantage, not comparative advantage.

This is a third, less-emphasized lesson from the Ricardian model.

Free Trade: Wages

Due to markets being perfectly competitive, firms pay workers the value they add to production (marginal product).

Recall $MPL^H_{\text{pie}} = 9$. This is a real wage, measured in quantity of goods rather than money.

Workers sell the pies they earn for the world market price of 1, making their real wage $\frac{P_{\text{pie}}}{P_{\text{potato}}} * MPL^H_{\text{pie}} = 9$ units of potatoes.

Since we have a one-for-one price, the units of potatoes and pies they earn are of equal value on the global market.

Foreign real wages rise to 12. **Foreign workers earn more as a result of maintaining absolute advantage over Home**

Absolute Advantage

Determines wages. Foreign workers earn more as a result of having superior technology.

How do we identify that again? MPL is higher for both goods in one country.

In contrast trade flows are determined by **comparative advantage**.

The underlying implication for this finding is that as countries invest in techonological development, real wages rise.

Empirical Evidence

This finding of MPL and real wages co-moving is well supported by surronding research. At a glance, real wage rises with labor productvitiy.

To Recap

- Countries with no absolute advantage in production can still trade!
- Some advantages are simply driven by technological differences according to this rather dated theory
- Since then, the **internet** and subsequent **information age** have largely narrowed differences in technology
- **What else helps us understand what drives our need to trade goods?**

Next Class

Hechscher-Ohlin Model suggests differences in factor endowments can explain trade patterns