Chapter 5 - Standard Trade Model

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In the Ricardian and Heckscher-Ohlin models of trade, we have analyzed what happens when a transition occurs from autarky to free trade.

However, few countries today are in autarky (North Korea, Myanmar...).

The “standard” trade model lets us ask how economic growth and transfers of income change the trading equilibrium.

This is covered in Krugman and Obstfeld Chapter 5 (both editions).
The **standard trade model** is built on four key relationships:

1. the relationship between the PPF and the world RS curve,
2. the relationship between relative prices and RD,
3. the world equilibrium as determined by world RS and RD,
4. how changes in the **terms of trade** affect a nation’s welfare.

The two graphs that we will deal with are:

- The PPF curve with appropriate indifference curves and relative prices.
- The World RS-RD graph.
Terms of Trade: the price of a country’s exports divided by a country’s imports.

If China exports textiles only and Canada exports computers only, then China’s terms of trade is:

\[ TOT_{china} = \frac{p_T}{p_C} \]

and Canada’s terms of trade is

\[ TOT_{canada} = \frac{p_C}{p_T} \]
Standard Trade Model: The Welfare Effect of Changes in Terms of Trade

- Generally, *a rise in the terms of trade increases a country’s welfare, while a decline in the terms of trade reduces its welfare.*
- Intuitively, if TOT falls, price of what you produce goes down relative to price of what you consume.
- Intuitively, if TOT rises, price of what you produce goes up relative to price of what you consume.
A reduction in the Terms of Trade puts Canada on a lower indifference curve.
What determines changes in relative prices?
- Shifts in RS through economic growth.
- Shifts in RD caused by transfers of income.

Continue with the assumption that China is an exporter of textiles and Canada is an exporter of computers.
There can be three types of growth.

1. Unbiased: Growth is equal in the two sectors.
2. Export biased: Growth is greater in the export sector.
3. Import Biased: Growth is greater in the import sector.
Standard Trade Model: Unbiased Growth

Productive ability in each of the two sectors increases by the same proportion and can be caused by balanced productivity growth or equally proportional increases in the endowments of all factors.
Standard Trade Model: Unbiased Growth in China

The diagram illustrates the relationship between various price ratios and quantities in a standard trade model context, focusing on China and a comparison with Canada. The axes and relevant equations are labeled accordingly, depicting the economic theories underlying trade and growth scenarios.
Because China’s PPF expands symmetrically, it is tangent to the old world-price ratio $\frac{p_c}{p_T}$ at the same relative supply. China’s RS is unchanged.

So why does world-RS change?

Because it is a weighted average of Chinese and Canadian RS and China’s weight has gone up.
Because China is now larger, free trade world relative prices will be more similar to China’s autarky relative prices.

China’s terms of trade deteriorate.

However, this is very likely to be offset by its increased production capacity. China is likely to be better off.

The perverse case where productivity growth makes a country worse off is called “immiserizing growth” and only holds under very restrictive circumstances.
Canada unambiguously gains from Chinese Productivity gains!

World relative factor prices are more similar to China and dissimilar to Canada.

Recall that smaller countries win more from free trade.
Suppose that China becomes more productive in its export sector than its import sector.

This can be caused by one or both of the following

1. Increased productivity in its export sector.
2. An increase in the endowment of its (already) abundant factor.

This will have two effects on China’s terms of trade:

1. \( \frac{p_c}{p_t} \uparrow \) due to increased world efficiency in the textile sector.
2. \( \frac{p_c}{p_t} \uparrow \) as world prices more closely resemble China’s autarky relative prices.

- as China’s RS shifts left so does the weighted average world RS
- as China’s PPF shifts out, China’s RS receives a higher weight in weighted average world RS
Standard Trade Model: Export Biased Growth in China

The Standard Trade model

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The results are very similar to the case of unbiased growth.

China’s terms of trade deteriorate as export prices fall relative to import prices.

China’s PPF shifts out.

Canada’s terms of trade improve as export prices rise relative to import prices.

Canada unambiguously wins.

The change in China’s welfare is uncertain but is very likely to be positive as in the case of unbiased growth.
Standard Trade Model: Import Biased Growth in China
Suppose that China becomes relatively more productive in its import sector than its export sector.

This can be caused by one or both of the following:

1. Increased productivity in its importing sector.
2. An increase in the endowment of its scarce factor.

This will have two effects on China’s terms of trade:

1. $\frac{p_c}{p_t} \downarrow$ due to increased world efficiency in the computer sector.
2. $\frac{p_c}{p_t} \uparrow$ as world prices more closely resemble China’s autarky relative prices.

- as China’s RS shifts right so does the weighted average world RS
- as China’s PPF shifts out, China’s RS receives a higher weight in weighted average world RS
The Standard Trade model

Standard Trade Model: Import Biased Growth in China

- Welfare consequences are ambiguous.
- Canada gains if China’s terms of trade deteriorate and loses otherwise.
- China’s gains if its terms of trade improve but might also gain if its terms of trade deteriorate.
▶ Does China prefer export-biased, import-biased or unbiased technological progress?
▶ Answer not clear.
▶ In terms of the change in the terms of trade, China is hurt most by export-biased and least by import-biased growth.
▶ But this might be offset by the different impacts on aggregate productivity.
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Standard Trade Model: Caveats

- The predictions are very crisp and clear when we have two countries and two goods and each country is large enough that it can affect world prices.
  - Both are big open economies in the model.
- With 153 members of the WTO alone, it is unclear how much any country can affect world relative prices except within extremely narrowly defined industrial categories (e.g. Apple and Dell computers).
- However, this framework is useful for thinking about how relative price changes can have differential effects depending on what the country’s industrial structure looks like.
  - This is the point of the Rodrik and *The Ethicist* articles.
We have just discussed how changes in countries’ ability to supply goods will change their and others’ terms of trade and their welfare.

Changes in world relative demand can affect welfare through changes in the terms of trade.

Up to this point, we have assumed that preferences are identical and homothetic.

If this is true, then changes in income across national borders would not change the RD curve.

Suppose that preferences are not identical and homothetic and that we can look at differences in relative demand across countries by examining differences in countries’ marginal propensity to consume different goods.
Suppose that the $MPC_{textiles}$ is higher in China than it is in Canada.

If we transfer income from Canada to China, what will happen to RD?

We are making a transfer of income from a country that values computers relatively highly to one that values textiles relatively highly.

World relative demand for textiles will therefore increase.
Standard Trade Model: Shifts in RD

\[
\frac{p_C}{p_T} \quad \frac{Q_C}{Q_T}_1 \quad \frac{Q_C}{Q_T}_0
\]

\[
RS^W \quad RD^W_1 \quad RD^W_0
\]
Consider the impact of *Foreign Aid*.

In general, a transfer worsens the donor’s terms of trade if the donor has a higher *MPC* to spend on its export good than the recipient. A transfer improves the donor’s terms of trade if the donor has a lower *MPC* to spend on its export good than the recipient.

This introduces the seemingly perverse idea that foreign aid can make a recipient country worse off if the recipient has a higher MPC in the donor’s export sector. However, this must be balanced against gains that come from additional income.

This is not a completely minor issue: a large part of foreign aid is tied to contracts with firms in the donor country.
The Standard Trade model

Standard Trade Model: Readings

- *The Ethicist* column asks if clothing donations to third world countries are ethical based on the fact that they harm the clothing industry in those countries.

- The Rodrik food prices blog post asks the same question about food donations to third world countries and farmers’ income in their country.

- From a dynamic perspective, Paul Collier (2006) criticizes “fair trade coffee” because it keeps developing countries “trapped” in agriculture.