14.54 International Trade
— Lecture 5: Exchange Economies (II) —
Welfare, Inequality, and Trade Imbalances
Today’s Plan

1. Edgeworth Box
2. Redistributive Effects of Trade
3. Trade Over Time and the Balance of Trade

The small graphs found on slides 4-10, 16-18, 20, 26, and 29 are courtesy of Marc Melitz. Used with permission.
1. Edgeworth Box
Constructing the Edgeworth Box
Constructing the Edgeworth Box
Examples of Edgeworth Box

- Example 1: $MRS^E < MRS^{E*}$

- There are gains from trade (where Home exports $C$)
Examples of Edgeworth Box

- Example 2: $MRS^E > MRS^{E*}$

- Again, there are gains from trade (where Home exports $F$)
An Arbitrary Trade Price

- Consider an arbitrary trade price $p^T$

- $p^T$ cannot be an equilibrium price
- Home wants to export more $C$ than foreign wants to import
- Equilibrium price adjustment: $p^T = \frac{p^T_C}{p^T_F}$
In the equilibrium, indifference curves must be tangent.

- All the gains from trade must be exhausted.

Pareto efficient allocation: Cannot make home better off without making foreign worse off (and vice-versa).
Pareto Efficiency

- **Definition:** the contract curve is the set of all Pareto efficient allocations in the Edgeworth box

- The free trade equilibrium must both be on the contract curve (efficient allocation) and in the “gains from trade” lens
What happens when tariffs or other government interventions distort the trade prices faced by consumers in different countries?

Consumers in both countries no longer have the same $MRS$

... and efficiency property is lost
2. Redistributive Effects of Trade
Motivation

- How should one think about welfare gains for the “aggregate” consumer?
- Does this imply gains for all consumers?
- If not, how can one weigh gains for some against losses for others?

**Basic Setup:**

- Assume that consumers still share the same homothetic preferences but that they have different endowments $E$
- Can think of workers as being ‘endowed’ with the bundle of goods they can produce
Are GM workers likely to gain from trade?

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Are pharma workers likely to gain from trade?

Image courtesy of Pan American Health Organization. License: CC: BY-NC.
Consumers 1 and 2 have ‘equally valuable’ endowments:

\[ U^0 = U(E^1) = U(E^2) \]

And attain the same welfare level in autarky as an ‘average consumer’:

\[ U^A = U(\bar{E}) \]

Note that \( U^A > U^0 \): gains from within-country trade
What happens when this country opens up to international trade?

Assume that home is relatively abundant in C so $p^T > p^A$
Effects of Trade

- What happens when this country opens up to international trade?
- Assume that home is relatively abundant in $C$ so $p^T > p^A$
Redistributive Effects of Trade

- How are losses for consumer 1 possible?
- All consumers gain from trade compared to consuming their endowment: \( E_1, E_2, \) or \( \bar{E} \)
- But consumer 1 gains more from intra-national trade than from international trade
- Also:
  - Consumer 1 need not lose from international trade but will always gain less than ‘average’ consumer
  - Consumer 2 will always gain more from trade than ‘average’ consumer
  - ‘Average’ consumer must gain from trade (so long as \( p^T \neq p^A \))
Who is more likely to gain from trade?

Intuition: International trade reduces the benefit from ‘scarcity’
Interpreting Aggregate Gains from Trade

- Note that for every consumer who gains less than the ‘average’ consumer from trade
  - ... there must be a consumer who gains more than the ‘average’ consumer

- A government policy maker can always redistribute the consumers’ endowments to ensure that everybody gains from trade
  - For example, swap consumers’ endowments so that they both end up with $\bar{E}$
  - This would be an extreme case of redistribution

- More generally, there will always be a payment that consumer 2 can make to consumer 1 such that consumer 1 would not lose from trade

- However, in practice, this kind of redistribution can be very hard to implement!
Analogy for Developed Countries

- Think of ‘high tech’ \((H)\) and ‘low tech’ \((L)\) workers owning the goods that they help to produce.
- A developed country is relatively abundant in \(H\).
- Without trade, \(H\) is relatively cheap in developed countries.
  - ... and relatively expensive in the rest of the world.
- Trade induces an increase in \(p_H/p_L\) in developed countries.
  - This helps \(H\) workers and hurts (relatively) \(L\) workers.

**Consequences for trade and redistributive policies:**

- Trade restrictions would help alleviate income inequality.
  - ... but would lower average incomes relative to policies that redistribute income more directly (such as income taxes or trade adjustment assistance).
- Also, in the longer run, \(L\) workers may become \(H\) workers.
3. Trade Over Time and the Balance of Trade
U.S. Trade Deficits: Good or Bad?

U.S. Trade Balance graph removed due to copyright restrictions.
Basic Framework

- In a single period model, trade must be balanced
- In reality, balance of trade occurs over time
- We will study this in a simplified 2-period model
- There are now 4 goods that are consumed: \( C \) and \( F \) today and tomorrow
- For simplicity, we will combine \( C \) and \( F \) consumed in a same period into an aggregate consumption index
  - Consumption today and tomorrow
- Same concept of endowments: index of goods that can be produced today and tomorrow
Consumer Preferences Over Time

- Consumers have preferences for $C$ and $F$ but also for consumption today relative to tomorrow.

- If can not trade over time (borrow & lends), then must consume at the endowment point.
Trade Over Time

- If a country can borrow and lend with the rest of the world at a given interest rate

- The relative price $p_t / p_{t+1}$ is directly related to the interest rate:
  
  $$r_t = \left( \frac{p_t}{p_{t+1}} \right) - 1$$
Explaining the Negative U.S. Trade Balance

- Explanation 1: The U.S. expects to be more productive tomorrow than the rest of the world (same consumer preferences over time)
Explanation 2: U.S. consumers are more impatient than consumers elsewhere