Gains from Trade (GFT)
International Trade

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Lecture Slides

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Outline

GFT without production adjustments

- Review of consumption choice theory
- Select consumption x,y to maximize utility $u(x, y)$ subject to the income (I) –budget– constraint $I = p_x x + p_y y$
- The solution to this problem generates the individual consumer's demand for x and y as a function of income and the relative price p_x/p_y. Total demand is the sum of all these individual demands and depends on the relative price and total income (and may also depend on the distribution of income).
- If we also specify the supply side of the economy, then we can determine the relative price by equating the relative total demand of x and y to the relative total supply of x and y.

GFT without production adjustments

- Instead of thinking of a consumer who has an amount I to spend on –perishable– goods X and Y at a store, we can think of somebody who owns a bundle of goods X and Y and who goes to the market where he potentially trades some of his goods before returning home and consuming his new bundle.

- Figure 1 below shows the consumption-trade choice under 3 different prices that this individual may encounter in the market: P1, P2 and P3 (all must go through the endowment point A because there is no obligation to trade at any price). The black line is an indifference curve.

- If P=P2, then the market price is tangent to the indifference curve and there is no reason for the individual to trade. If P=P1 (cheap X), the individual will sell Y and buy X . If P=P3 (cheap Y), the individual will sell X and buy Y.

- Note that P2 is the price that makes the individual happy to just consume his endowment (what we call autarky).
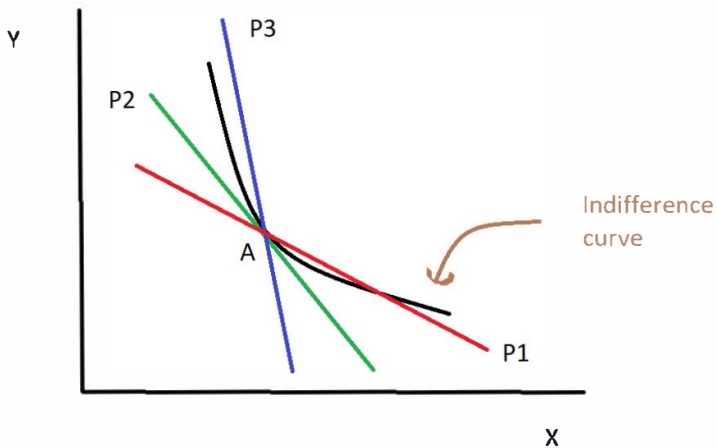
Figure 1: Individual endowment and market price

- This figure is useful in revealing the choices available to a country that is endowed with total amounts of X and Y and faces given world –relative– prices for its goods. Under some assumptions (for instance, if the country consists of individuals who are all alike in terms of preferences and endowments) the exact analysis of figure 1 applies. If the country does not trade internationally then it has to consume its endowment (point A) and the price in this country has to be P2. There is only one price at which the individuals in this country are "happy" to consume what they have.
- If the country opens up to trade, then it can consume a bundle that is different from its endowment.
- Note that the country is better off (it can reach a higher indifference curve) no matter what the world price is. All that matters is the the world price differs from the domestic price before trade opens up.
- Note also that we do not give the endowment point for the ROW because we assume that the ROW is large so that our country can buy and sell as much X and Y it wants without changing the world price (the dotted line). Very much like when you go to Coop, you can buy as much chocolate as you want without affecting their prices.
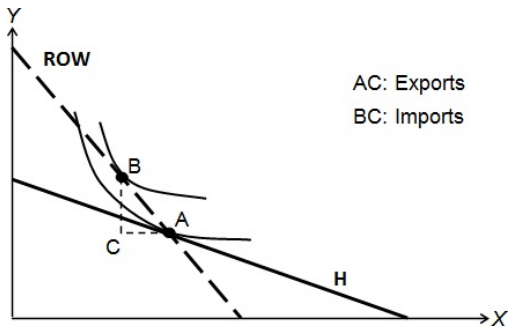
Figure 2: Trade with the rest of the world ROW

Source of gains: International differences in pre-trade prices.

- An economy with endowments X and Y, point A (**A**utarcy) and the rest of the world (ROW).
- If $\frac{p_X}{p_Y}_H < \frac{p_X}{p_Y}_{ROW}$, then H exports CA X and imports CB Y. It exports the good which is relatively cheap compared to the ROW
- (If $\frac{p_X}{p_Y}_H > \frac{p_X}{p_Y}_{ROW}$ then H would like to export Y and import X. In either case the country is better off with trade.)

- Two endowment economies with the same preferences but different endowments of X and Y (points A and B respectively).
- $\frac{p_X}{p_Y}$ is flatter (X is relatively cheaper) in H because the relative supply of X is greater in H (point A) in comparison to F (point B). That is, $X_o/Y_o > X_1/Y_1$.
- If the two countries could trade at some intermediate price they would be better off: H would trade some X for Y and F some Y for X.
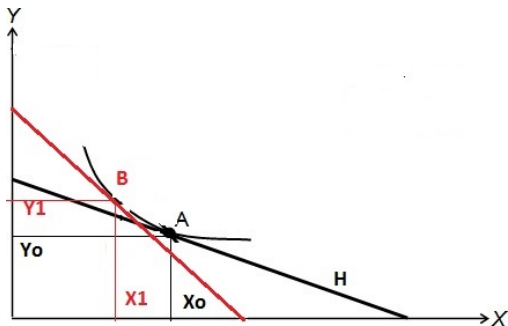

Figure 3: Trade, two endowment economies

We can establish that if the world consists of two countries then world prices will necessarily lie between their autarkic prices:

$$\left(\frac{p_X}{p_Y}\right)_{H,A} < \left(\frac{p_X}{p_Y}\right)_W < \left(\frac{p_X}{p_Y}\right)_{F,A}$$

Proof: Suppose $\left(\frac{p_X}{p_Y}\right)_{H,A} = 1$, $\left(\frac{p_X}{p_Y}\right)_{F,A} = 3$ and $\left(\frac{p_X}{p_Y}\right)_W = 4$. Then both H and F would want to sell X and buy Y. The excess supply of X (excess demand for Y) would lead to a decrease of $\left(\frac{p_X}{p_Y}\right)_W$

- Individual *losers* from trade: Are there enough gains to make everybody better off? Yes. Compensation.

- An extreme example with two groups, A and B, each one totally specialized in X and Y. No domestic trade: Blue (A and B); Domestic trade: Dark green (C); Int'l trade: light green (AA and BB)
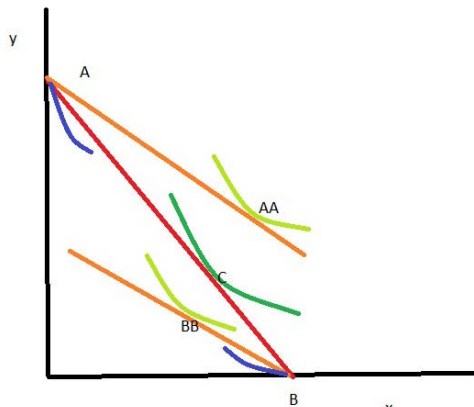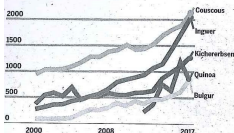

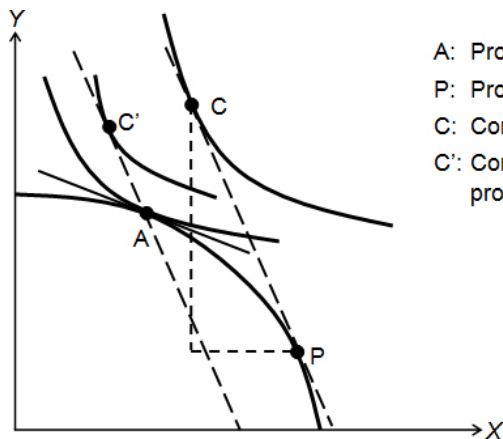Figure 4: Trade, losers and winners

A real world example

- Review of PPF (production possibility frontier)
- Production functions
  $X = F(L_X), Y = G(L_Y) \rightarrow \Gamma(X, Y, L) = 0, L = L_x + L_y$
- Efficient production
- Curvature and opportunity cost (scarcity)

GFT with production adjustment

A: Production and consumption under autarky

P: Production under free trade

C: Consumption under free trade

C': Consumption under free trade (without production adjustments)

(a) We abstract from the possibility that the PPF could shift out as a result of trade. Even greater gains in this case.

(b) Determination of the trade pattern: Comparative advantage Relative positions of national supply curves. Relation to the shape of PPF
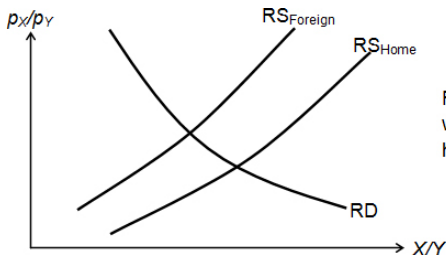
For any given relative price p_X/p_Y, Home would produce relatively more of X (Home has a CA in X).

Applications of trade theory

Home demand for imports $=$ Foreign supply of exports

The effects of an increase in foreign demand

- Higher foreign demand for the exportable of a country improves its terms of trade (makes its exportable more expensive).
- If the supply curve of net-exports is upward sloping, the price increase in accompanied by an increase in the quantity of exports.
- If the supply curve of exports became negatively sloped after some quantity then the export quantity could potentially drop.
- The analogy with the supply of labor.

Growth and welfare

- Growth in the basic model can be shown by an outward shift of the PPF. This shift per-se would cause the income of the country to rise.
- However, keep in mind that the expansion has again an effect on the terms of trade!

- Immiserizing growth: this is a case in which a country is actually worse off after growth. When the expansion primarily takes place in the exporting sector, the terms of trade can deteriorate so much as to outweigh the initial gains from growth.
- Conditions for immiserizing growth:
  - ▶ Export biased growth
  - ▶ Inelastic demand
  - ▶ Large player
- Example:Brazil and coffee Bumper crop and farmers' welfare

The transfer problem

Examples:

- German reparation payments after WWI
- Foreign aid
- Changes in asset prices
  - Examples: An depreciation of the USD; the appreciation of the CHF vs the EUR
  - An unnoticed implication of the removal of the exchange rate floor: Massive redistribution of wealth away from Switzerland!

Net International Investment Position 2013 (2014)

Singapore	182
Norway	170.9
Switzerland	119.6
S. Arabia	106.6
Japan	74.8
Belgium	49.7
Germany	36.4
Venezuela	30.5
China	17.1
Argentina	14.2
Canada	6.9
Chile	-13.8
France	-19.5

Figure 5: Net International Investment Position

Net International Investment Position 2013 (2014)

UK	-24.8
Italy	-27.7
Brazil	-33.1
Mexico	-33.3
US	-39.7
Australia	-55.6
Spain	-94.5
Ireland	-106.7
Portugal	-111.6
Greece	-121.9

Figure 6: Net International Investment Position

Two key questions:

1. Is there a secondary loss (deterioration of the TOT for the transferor)?

   Model Setup:

   - Country A exports X and imports Y $\left(TOT_A = \frac{p_X}{p_Y} \right)$
   - A makes a transfer of T to B
   - m, $m^\star$ denote A's and B's marginal propensity to spend on imports

   What happens to the world demand for X?

   $$\Delta D_X = \Delta D_X^A + \Delta D_X^B = -(1 - m)T + m^\star T$$

   $$\Delta D_X > 0 \text{ if } m + m^\star > 1$$

   If global demand for good X increases then its price must go up and country A (the transferor) experiences a terms of trade improvement. This mitigates the income loss of the donor from the

   transfer

2. Is it better to give or to receive? To receive!

   But there are some subtle issues concerning foreign aid, such as the effects on incentives, dependency etc.

   Interesting applications to the mezzogiorno and also to Switzerland! (In the context of inter-cantonal transfers of income and their effects on the incentives of poor cantons to improve their situation).

Appendix: Edgworth box

(b) *The Edgeworth box diagram:* Let's now consider two countries H and F which are endowed with a specific amount of each good.
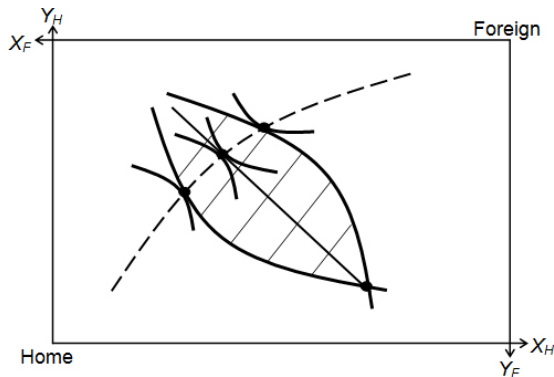
Opening the two countries up for trade makes them better off.