

### Topic 3: The Standard Theory of Trade.

Outline:

1. Main ideas.
  - Increasing opportunity costs.
  - Community indifference curves.
2. Marginal rates of transformation and of substitution.
3. Equilibrium under autarky.
4. Gains from trade.
  - Gains from specialisation.
  - Gains from exchange.
5. The basis for comparative advantage.

READ: Ch. 3.

Main ideas:

The standard theory is based on more general assumptions about the PPF than the Ricardian theory.

In general,

- several type of resources (land, labour, capital) are used to produce goods;
- the law of diminishing returns applies;
- further, different resources are relatively more ‘useful’ in producing different goods (*e.g.*, land for wheat, capital for cars, labour for carpets).

For all these reasons, the more of a good is already being produced the greater its opportunity cost. Thus, the standard model assumes increasing OC.

With increasing OC, the PPF of a country becomes concave to the origin.

This demand side of the economy is represented by a community indifference curve (CIC) map.

The CIC map represents the aggregate preferences of the residents of a country. In other words, it is a combination of the individual ICs that of individual residents.

This is controversial. Very severe assumptions on individual tastes are required to do this in a legitimate way (read section 3.3C).

Two assumptions used to justify the concept of CIC are relatively simple to understand:

- One approach is to assume that consumers are identical, *i.e.* they have identical ICs and the same income levels (the representative agent assumption).
- Another is to think of a CIC map as representing the social preferences of a very powerful economic planner and that this planner has unlimited powers to redistribute income between individuals.

Under each assumption, we can talk of the community as a single unit.

Interpretation aside, the CIC map has the same properties as ordinary ICs. Each IC represents a locus of combinations of X and Y that leave the 'community' at a given level of welfare. Each IC is

- downward sloping;
- convex to the origin.
- higher ICs represent higher welfare.

MRT and MRS:

The concept of marginal rate of transformation (MRT) relates to the production or supply side of the economy.

The MRT of good X is the same as the OC of good X: it is the amount of good Y that has to be sacrificed in order to produce an extra unit of good X. Conversely, it is also the extra amount of good Y that can be produced if one unit of good X is foregone.

Like OC, the slope of the PPF measures the MRT of the X-axis good. The MRT of good X increases as we move right along the PPF.

The concept of marginal rate of substitution (MRS) relates to the consumption or demand side of the economy.

The MRS of good X for good Y is the amount of good Y that the community is barely willing to sacrifice in order to consume one extra unit of good X. Conversely, it is also the extra amount of good Y that the community would want in order to be barely willing to give up one unit of good X.

The slope of any IC measures exactly the above.

A CIC is convex because of *diminishing marginal utility*.

As more of good X is consumed consumers get less and less extra utility from each extra unit – they are therefore willing to give up less and less units of good Y for each extra unit of good X they consume.

Thus, the MRS of good X for good Y falls as more of good X is consumed.

Equilibrium in autarky:

In autarky, an economy produces an equilibrium combination of two goods along its PPF, when the point of production allows the community to attain the highest possible CIC. This point is unique given that the PPF is concave and the CICs are convex.

The highest CIC is tangent to the PPF at this point. Tangency implies that  $MRS = MRT$ . In an economy with profit seeking firms this is a condition of equilibrium.

At any other point along the PPF, the CIC map cuts it from above or from below. Then  $MRT \neq MRS$ .

Suppose  $MRT < MRS$ . Then consumer's will be more willing to give up good Y for good X, than producers will have to give up if resources were to move from industry Y to industry X.

The above means that there will be profit opportunities for firms in industry X while losses will be made in industry Y. Thus firms will move from Y to X – output of X will increase while that of Y will shrink.

In equilibrium, the common slope of the CIC and the PPF also equals the relative price of X.

Thus, another way to state the equilibrium condition is that the relative price of good X must equal both its OC of production and the rate at which the community is willing to exchange X for Y.

This condition has to be modified if either of the two industries is not perfectly competitive.

#### Gains from trade:

As in the classical case, it is better to start with one economy which is small with respect to the rest of the world.

The same graphical principles apply as in the classical model, except now that the PPF is curved and we have introduced the extra concept of CIC.

- Under autarky, the economy's CPF will coincide with its PPF.
- The equilibrium will be where there is tangency of the PPF/CPF with CIC.
- The relative price of X will be equal to the slope of the common tangent.

When it opens to trade, the PPF remains unchanged but its CPF is now represented by a straight line IBC.

- The slope of the IBC is the world relative price of good X.
- The domestic relative price of X will change to equal the world relative price.
- The IBC cannot lie outside the PPF and will not intersect it. Thus, the IBC must be tangent to the PPF at the point of production. This represents the country's maximum income.
- The IBC must also be tangent to a CIC at the point of consumption. This represents its optimal consumption.

- The right angle triangle defined by the production and consumption points gives the import and export of each good.

Gains from trade arise whenever the world relative price of X differs from its domestic relative price prevailing under autarky.

To understand the nature of adjustment and the resulting gains from trade, it is best to break this into two steps.

- First suppose that without changing production, the community moves to an optimal consumption point, its CIC will be tangent to the IBC passing through the old production point. There will be an increase in welfare as the community MRS adjusts to the world relative price of good X. This is known as the *gains from exchange*.
- Now suppose that the point of production is optimised in order to maximise the country's income at world prices. This causes an outward shift in the IBC and a further increase in welfare. This is known as the *gains from specialisation*. In the second step, optimal consumption is adjusted continuously as the production pattern changes.
- The trade pattern generated in each step reinforces that generated in the other.

There is likely to be incomplete specialisation when the PPF is concave. This is because as more of the export good is produced, its OC rises until it finally equals the world relative price of that good. To produce more would be non-optimal.

Basis of comparative advantage:

In the standard model, it is not necessary for labour productivity to be inherently different between two countries, either in relative or absolute terms, for there to be a basis for CA between them.

Recall that CA arises in a particular good when a country has lower OC for producing that good. This remains the fundamental criterion for determining the pattern of CA.

The difference with classical theory is that OCs are no longer constant but increase as more of a good is produced. Thus, one has to be careful at which point of the analysis a comparison of OCs is made.

Suppose there are two countries, Home and Foreign, and two goods, X and Y. Home and Foreign could have

- different PPFs between X and Y.
- different CIC maps between X and Y.
- or both.

In each of these cases, it is likely that the autarky equilibrium will look different between the two countries. In particular, it is likely that the autarky relative price of good X will be higher in one country than in the other.

When the two countries open up to trade, the following will happen.

- *Arbitrageurs* will buy good X where it is relatively cheaper (let's say at Home) and sell it where it is relatively dearer (in Foreign). Thus, good X will flow from Home to Foreign. In exchange good Y will flow from Foreign to Home.
- As the demand for X goes up at Home, and that for Y goes up in Foreign, the relative price of X will rise at Home and Fall in Foreign.
- In equilibrium, there will be no further incentive for arbitrage when the relative price of good X is equal in both countries. But by now there has been an export of X from Home to Foreign and import of Y to Home from Foreign.
- Once trade has reached an equilibrium, the OC of good X will be equal in both countries.
- Thus, the principle of CA requires comparing the OCs of goods between two countries when both are producing in autarky.
- To summarise, a country has CA in a particular good if the relative price of that good under autarky is lower than in the other country.

With two countries, the equilibrium with trade is characterised by the following conditions.

- Each country faces the same relative price for each good (in equilibrium).
- Each country makes its consumption and production decisions optimally given this price.
- The two countries have *mutually consistent* trade plans.

Note that each country experiences both aspects of the gains from trade, but they may enjoy different magnitudes of this gain. Thus, trade does not necessarily promote equality between countries.