Lecture 3
The Standard Trade Model

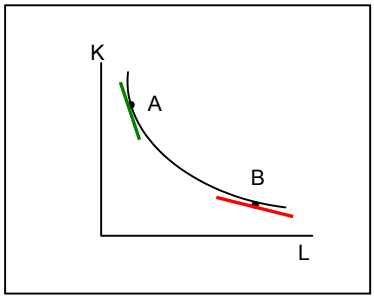
The previous model assumed a fixed coefficient technology: α_C and β_C of capital and labour were required to produce one computer and α_T and β_T of capital and labour were needed to produce one metre of textiles. ***Capital and labour were non-substitutable in production***. This resulted in linear production possibility curves as in Figure 2.1.

In this lecture this assumption is relaxed and the resulting model will represent the **'standard model of trade'** that economists use.

We assume that capital and labour are substitutable in both computer and textile production by means of **production functions**:

$$y_C = f(K_C, L_C) \text{ and } y_T = f(K_T, L_T) \quad (1)$$

From the production function for computers we can draw an isoquant showing the different quantities of K and L needed to produce a given number of computers. (We can do the same for textiles).



At A, computers are being produced using capital-intensive methods because capital is relatively cheap compared to labour; at B, computers are being produced using labour-intensive methods because capital is relatively cheap compared to labour.
[Note that the slope of the budget lines is p_L / p_K which is amount of capital producer would have to *market exchange* for an additional unit of labour[1]. The slope of the isoquant is amount of capital producer could *technologically substitute* for an additional unit of labour. In equilibrium they are equal].

So we say that computers are capital-intensive, relative to textiles, *if for all factor price ratios* p_L / p_K:

[1] If C is the cost of production, C/p_K and C/p_L are the amounts of capital and labour that could be bought if all of C was spent either on capital or labour. So slope is: $(C/p_K)/(C/p_L) = p_L/p_K$

$$\frac{K_C}{L_C} > \frac{K_T}{L_T} \Rightarrow \frac{L_T}{K_T} > \frac{L_C}{K_C} \qquad (2)$$

If computers are capital-intensive, then textiles are labour-intensive.

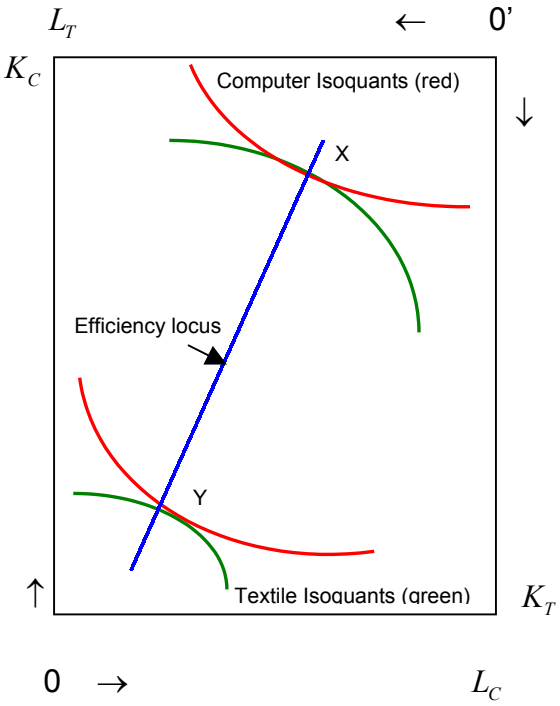


Figure 3.1:
The Edgeworth Box in Production

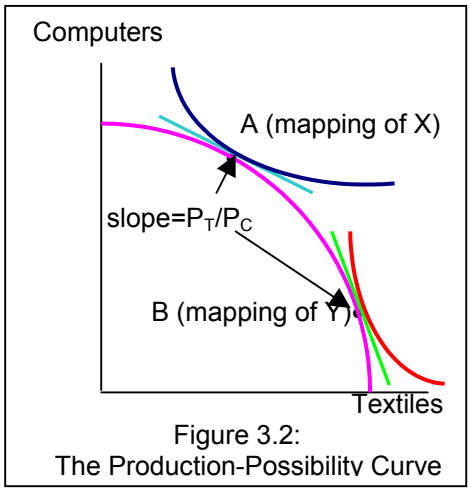
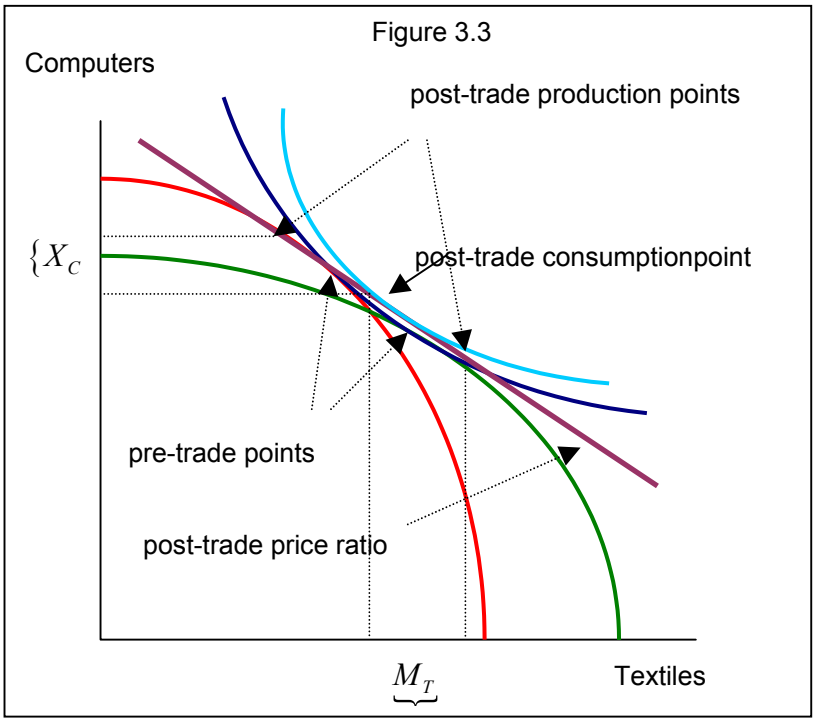


Figure 3.2:
The Production-Possibility Curve

Figure 3.2, represents the **pre-trade** position. The country must produce and consume at the same point. What this point is depends on the relative price of textiles to computers which is determined by the relative demand for textiles to computers.
At A in Figure 3.2, textiles are relatively cheap compared to computers; at B they are relatively more expensive. Producers respond to this by producing relatively less textiles at A and more textiles at B.



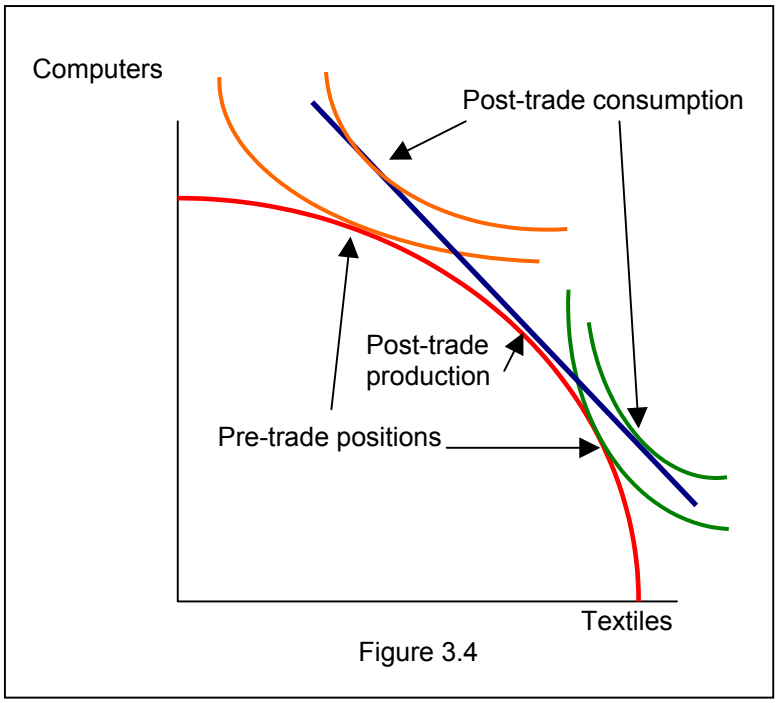


Figure 3.4

The Terms of Trade

The terms of trade (TT) is the rate at which a country's exports exchange for its imports: in a two-country model, it is the relative price of the exported commodity to the imported commodity.

When a country's TT improve, its welfare increases: in Figure 3.5, A and B are the original points of *production* and *consumption*, respectively, for the *textile-exporting country*; when TT improves, the price of textiles relative to computers rises, and C and D are now the new points of production and consumption; D is on a higher indifference curve than B.

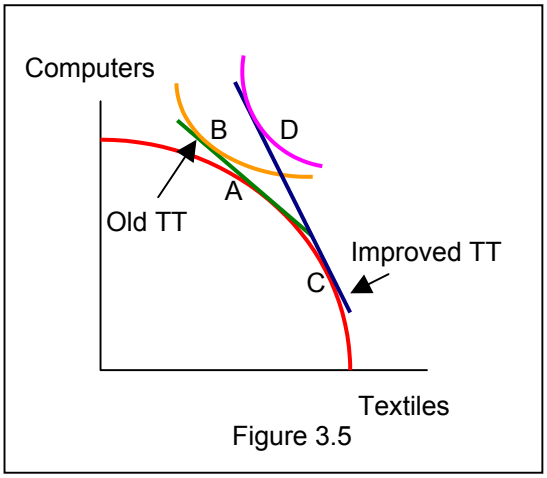


Figure 3.5

The terms of trade are determined by the intersection of the relative demand and supply curves. The supply curve slopes upwards because with a higher p_T / p_C both countries will produce more textiles and fewer computers.

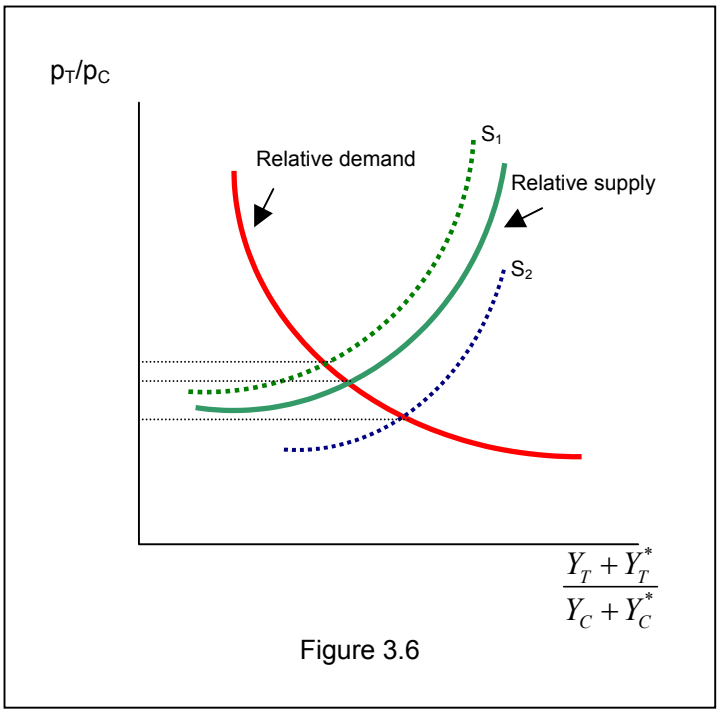


Figure 3.6

If relative demand/supply shift so as to improve a country's TT, it will improve its welfare.

Growth and Trade

Growth in a country's factor endowment (for example, investment increases capital supply and immigration increases labour supply) will push its production possibility curve outwards. But this improvement in production possibilities may be biased towards one or the other commodity: an increase in capital will *bias growth* in favour of the capital-intensive commodity (computers) while an increase in labour will *bias growth* in favour of the labour-intensive commodity (textiles).

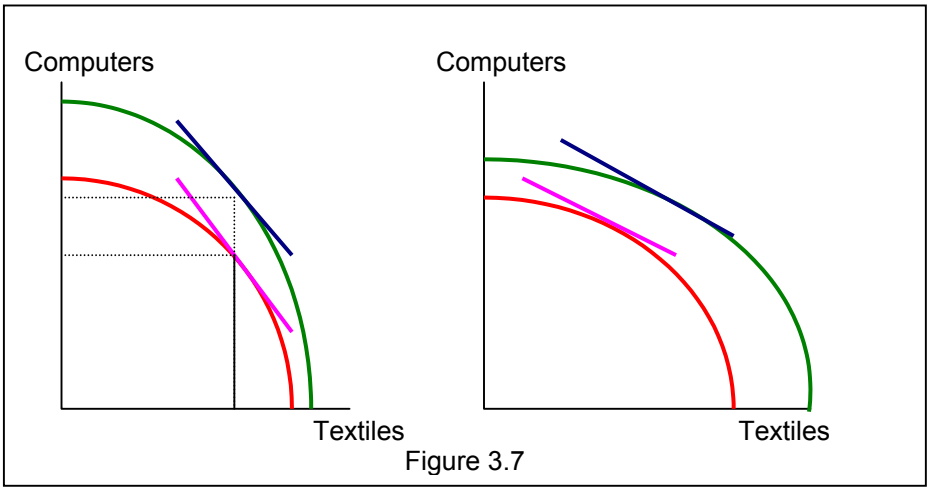


Figure 3.7

Growth is **export-biased** if it has a disproportionate effect on the exports of a country; it is **import-biased** if it has a disproportionate effect on the imports of a country. In the left-hand panel of Figure 3.7, growth is computer-biased: it is export-biased if that country exports computers, it is import-biased if that country imports computers.

Suppose a country experiences computer-biased growth: then its output of computers increases relative to that of its textile output (See left hand panel of Figure 3.7). Hence world relative supply of computers to textiles increases and supply curve shifts to S_1 in Figure 3.6. The relative price of texiles to computers p_T / p_C rises.

If the country is a computer-exporting country, then its TT deteriorate and it experiences a loss of welfare from this. If the country is a computer-importing country, then its TT improve and it experiences a gain in welfare from this.

Similarly, if a country experiences textile-biased growth: then its output of textiles increases relative to that of its computer output (See right hand panel of Figure 3.7). Hence world relative supply of textiles to computers increases and supply curve shifts to S_2 in Figure 3.6. The relative price of texiles to computers p_T / p_C rises.

If the country is a textile-exporting country, then its TT deteriorate and it experiences a loss of welfare from this. If the country is a textile-importing country, then its TT improve and it experiences a gain in welfare this.

So, export-biased growth worsens a country's TT and against the welfare gains from growth must be balanced the welfare reduction from a TT deterioration.
Import-biased growth improves a country's TT to the welfare gain from growth must be balanced the welfare gain from a TT improvement.

The term **immiserizing growth** is used to describe a situation where (for developing countries) the gain from export-biased growth is more than offset by the losses from TT deterioration.

Income Transfers

Suppose, industrialised countries ('The North') transfer income to developing countries ('The South'). If the North and South have different marginal propensities to spend on textiles and computers, then relative demand for textiles will shift. Suppose, the relative demand for textiles goes up (that is, demand moves to the right); then p_T / p_C will rise and if the South is textile-exporting, its TT will improve. **So to the welfare gain to the South of the income transfer, must be added its welfare gain from TT improvement.**

Import Tariffs and Export Subsidies

An import tariff is a tax on imports: it makes the price of the imported good higher in the domestic market than in the world market.

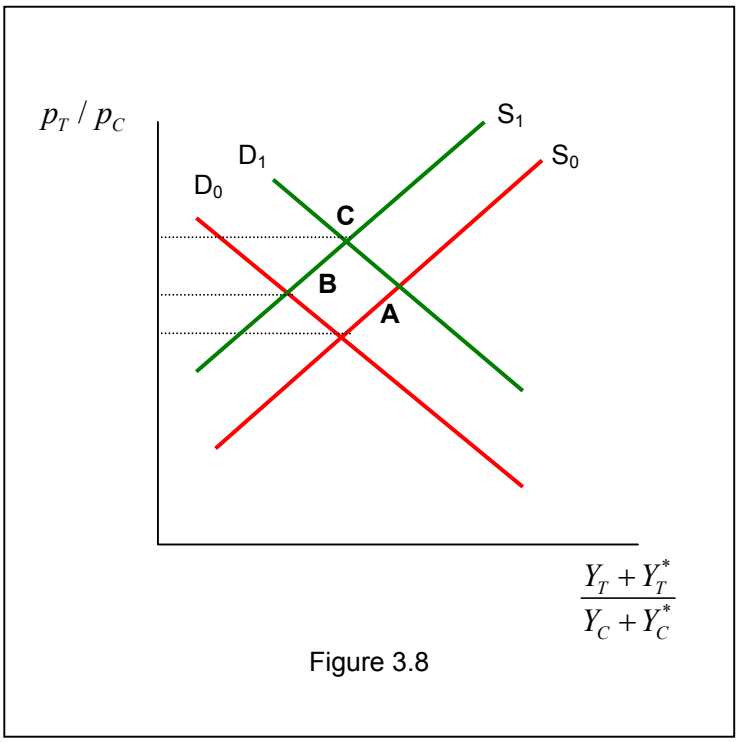


Figure 3.8

In Figure 3.8, the country imposes a 10% tariff on its imports of computers: so domestic prices of computers increase by 10%, relative to textiles (or, equivalently, p_T / p_C *falls*). So the country's output of textiles relative to computers falls and the (world) supply curve shifts to S_1. But, since textiles are relatively cheaper, relative demand shifts to D_1.

The world relative price of textiles p_T / p_C increases from A to B (supply effect) and B to C (demand effect). **So, the tariff improves the country's terms of trade.**

If the tariff-imposing country is small then world supply and demand will not shift by much – TT will remain virtually unchanged.

If the tariff-imposing country is a big country (USA) then world supply and demand may shift considerably – TT will change significantly.

Show that the effects of an export subsidy (on textiles) would be exactly the opposite of an import tariff (on computers): TT worsen.

In Figure 3.2A below, the relative price of textiles has gone up after trade and country is textile exporter

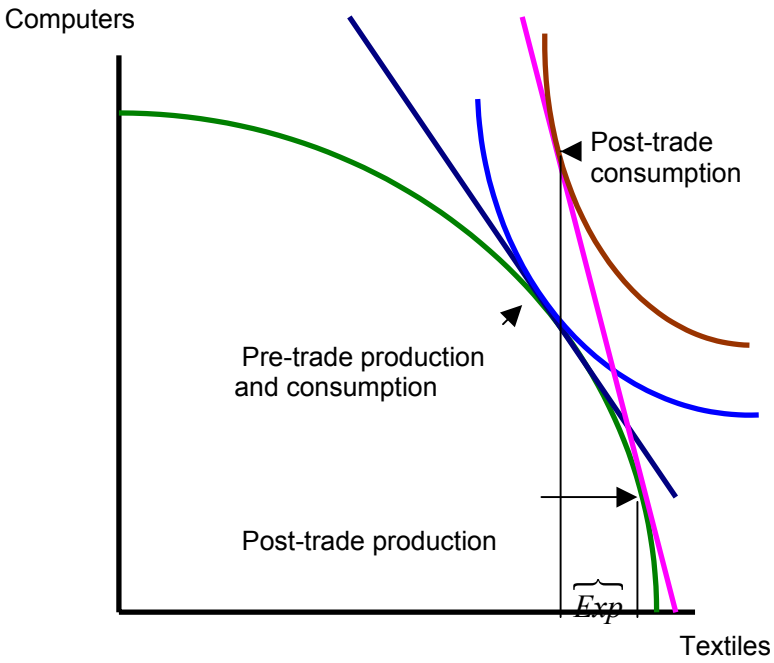


Figure 3.2A
After trade country has become a textile exporter
and enjoys a higher level of welfare

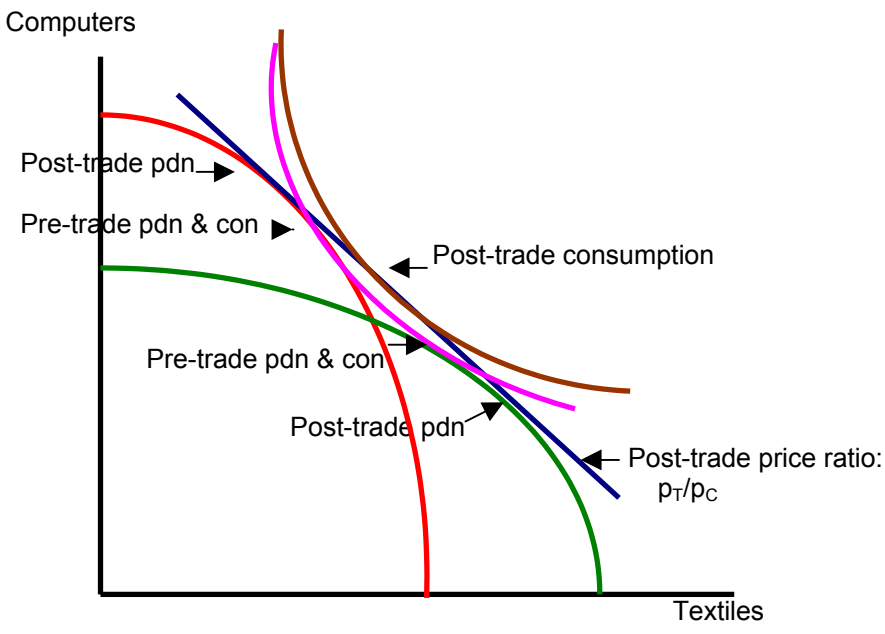


Figure 3.3