IMPERFECT COMPETITION AND TRADE

- Neoclassical model assumes industries are perfectly competitive, exhibit constant returns to scale and sell homogeneous goods

- In the case of manufacturing, these may be less than plausible assumptions

- Neoclassical theory predicts trade will be inter-industry in nature, however, there is empirical evidence that the structure of trade in manufactured goods is in part of an intra-industry nature, i.e., the simultaneous export and import of products that are very similar in terms of factor inputs and consumption

- Analysis has shown that this type of trade has something to do with imperfectly competitive market structures, scale economies and differentiated goods

- Competition vs. Monopoly

  - Monopoly in one or more of the industries in the basic model results in a distortion

  - Abstracting from the reason for monopoly, and given constant returns to scale, assume the home country has a monopoly producer of good X
- Under perfect competition:

\[ p = MC \]  \hspace{1cm} (1)

- Hence, with competition in X and Y:

\[ \frac{p_x}{p_y} = \frac{MC_x}{MC_y} = MRT \]  \hspace{1cm} (2)

- For a monopolist:

\[ TR = p_x X \]  \hspace{1cm} (3)

- Hence, change in revenue is:

\[ dTR = p_x dX + X dp_x \]  \hspace{1cm} (4)

- Dividing by \( dX \) gives marginal revenue:

\[ MR_x = \frac{dTR}{dX} = p_x + \left( \frac{dp_x}{p_x} \right) \cdot X \]  \hspace{1cm} (5)

(5) shows that for a monopolist, marginal revenue will be less than price, given that \( \frac{dp_x}{dX} < 0 \)

- Multiply second term of (5) by \( \frac{p_x}{p_x} \), and factor out \( p_x \):

\[ MR_x = p_x \left[ 1 + \left( \frac{dp_x}{p_x} \right) \cdot \frac{1}{(dX/X)} \right] \]  \hspace{1cm} (6)

Term \( \left( \frac{dp_x}{p_x} \right) / (dX/X) = 1/e_x \), where \( e_x \) is the price elasticity of demand for X
Substituting in for the elasticity in (6):

\[ MR_x = p_x \left[ 1 - 1/e_x \right] = MC_x \]  

(7)
i.e. under monopoly, \( 1/e_x \) measures the mark-up of price over marginal cost, so in general equilibrium:

\[ \left\{ p_x \left[ 1 - 1/e_x \right] \right\} / p_y = MC_x / MC_y = MRT < p_x / p_y \]  

(8)

As \( p_x > MC_x \), equilibrium price ratio \( p_x / p_y \) is greater than the slope of the production frontier (see Figure 1)

- \( A_m \) is the autarky equilibrium for the home country, given the autarky price ratio \( p_m \):
  - output of X below competitive level at A
  - monopolist raises relative price of X above its competitive level at \( p^a \)
  - welfare is reduced below competitive level at A

- Distortion induced by monopoly is endogenous compared to say a production tax that raised X’s price, i.e., if trade occurs, monopoly price can change, but tax distorted price does not
FIGURE 1: AUTARKY AND MONOPOLY
As the monopoly distortion is endogenous, trade may have additional benefits when there is imperfect competition - “pro-competitive” gains from trade.

In Figure 2, autarky is at point A, X being monopolized; assuming this is a small country, it faces fixed world prices when it trades, which we assume are equal to undistorted autarky prices, \( p^a = p^* \).

With trade, former monopolist faces a constant \( p_x^* \), so \( MR = p_x^* \), i.e. the perceived elasticity of demand is infinite, so monopoly distortion goes to zero.

Home country shifts to B, the move from A to B being the *pure, pro-competitive* gain from trade, i.e. the gain in a closed economy from eliminating monopoly.

Typically there will be gains due to comparative advantage, so world prices are \( p_1^* \), and trade takes economy from A to C.

The gains are made up of the pro-competitive effect, A to B, and the normal gains from trade of B to C, i.e. the pro-competitive effect adds to the gains from trade.
Cournot Competition

Suppose there are two identical countries each with single producer of \( X \), autarky equilibrium in Figure 3 being at A for both countries

Now allow for free trade, and assume each firm in this duopoly chooses their optimal output given output of the other firm, i.e. Cournot-Nash behavior

Let \( X_h \) and \( X_f \) be outputs of home and foreign firms. With trade, let the world price of \( X \) be \( p_x = p(X) \), where \( X = (X_h + X_f) \)

Perceived marginal revenue for the home firm is:

\[
MR_{xh} = p_x + X_h\{(dp_x/dX).(dX/dX_h)\} \tag{9}
\]

where for Cournot beliefs, \((dX/dX_h) = 1\)

\[
MR_{xh} = p_x + X_h (dp_x/dX) \tag{10}
\]

Multiplying \( X_h(dp_x/dX) \) by \( X/X \):

\[
MR_{xh} = p_x + X_h /X \{X.(dp_x/dX)\} \tag{11}
\]

and then by \( p_x/p_x \):

\[
MR_{xh} = p_x + p_x .(X_h/X) \{(dp_x /p_x)/(dX/X)\} \tag{12}
\]
This is similar to the formula for a monopolist, except for the term \( \frac{X_h}{X} \) which is share of the home firm in total sales, i.e. \( s_h = \frac{X_h}{X} \), so (12) is:

\[
MR_{xh} = p_x [1 - \frac{s_h}{e_x}] = MC_{xh}
\]  

(13)

Under Cournot, the firm’s mark-up is given by \( \frac{s_h}{e_x} \), which diminishes with market share

When the home firm raises output, revenues lost through reduced price are shared between both firms - home firm takes no account of revenue loss to the foreign firm (and vice-versa)

(13) proves formally that adding firms through trade makes demand facing any individual firm more elastic

In Figure 3, open up trade between two identical economies where A is autarky for both; can A still be an equilibrium?

Examining (13), market share for each firm falls from 1 to 1/2, so given \( e_x \), the fall in \( s_h \) \( (s_f) \) means that marginal revenue \( MR_{xh} \) \( (MR_{xf}) \) rises

If one firm raises output, believing the other will hold output constant, some of the loss in revenue from a lower price on the infra-marginal units is borne by the other firm
FIGURE 3: COURNOT COMPETITION AND TRADE
With trade, each firm perceives MR to be in excess of MC, each firm raises output until MR=MC, i.e. move to Q with prices still at p^a = p^*

There is no net trade, as each country consumes and produces the same amounts of X and Y (with no trade barriers, some consumers could be buying from the foreign producer, but such trade balances exactly - intra-industry trade in identical goods)

There is a gain from removing trade barriers as competition between the producers of X generates an increase in output in each country - it is a pure pro-competitive gain from trade

As the countries are identical, there is no pattern of comparative advantage, yet there is a gain from trade, i.e. comparative advantage is not a necessary condition for gains from trade