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:**

$$p = MC \qquad (1)$$

- **Hence, with competition in X and Y:**

$$p_x / p_y = MC_x / MC_y = MRT \qquad (2)$$

- **For a monopolist:**

$$TR = p_x X \qquad (3)$$

- **Hence, change in revenue is:**

$$dTR = p_x dX + X dp_x \qquad (4)$$

- **Dividing by dX gives marginal revenue:**

$$MR_x = dTR/dX = p_x + (dp_x /dX).X \qquad (5)$$

(5) shows that for a monopolist, marginal revenue will be less than price, given that $dp_x /dX < 0$

- **Multiply second term of (5) by p_x / p_x, and factor out p_x:**

$$MR_x = p_x [1 + (dp_x /p_x) / (dX/X)] \qquad (6)$$

Term $(dp_x /p_x) / (dX/X) = 1/e_x$, where e_x is the price elasticity of demand for X

- **Substituting in for the elasticity in (6):**

$$MR_x = p_x [1 - 1/e_x] = MC_x \quad (7)$$

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

$$\{p_x [1 - 1/e_x]\}/ p_y = MC_x / MC_y = MRT < p_x /p_y \quad (8)$$

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:**

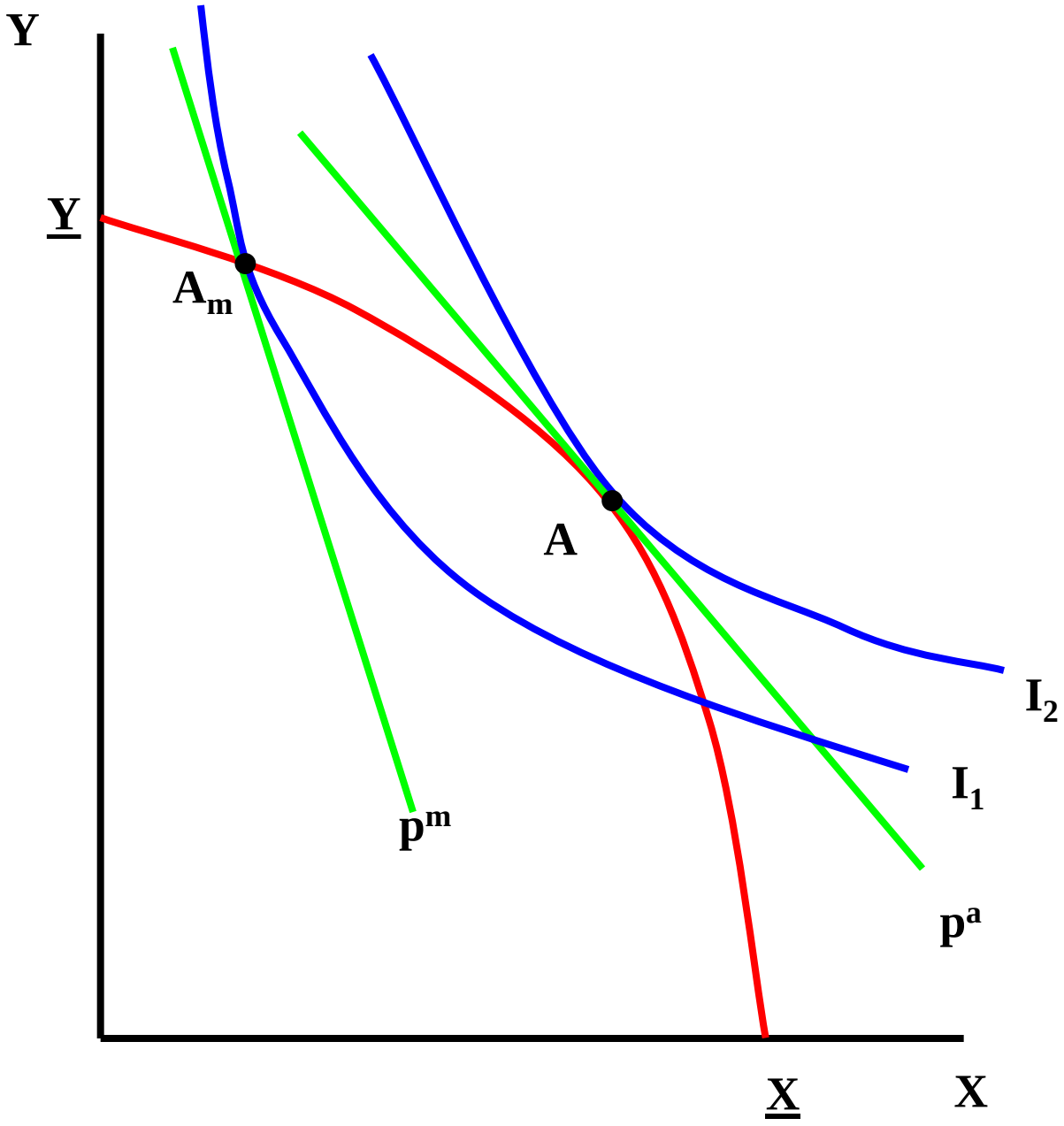
  - **output of X below competitive level at A**

  - **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, $p^a = p^*$**

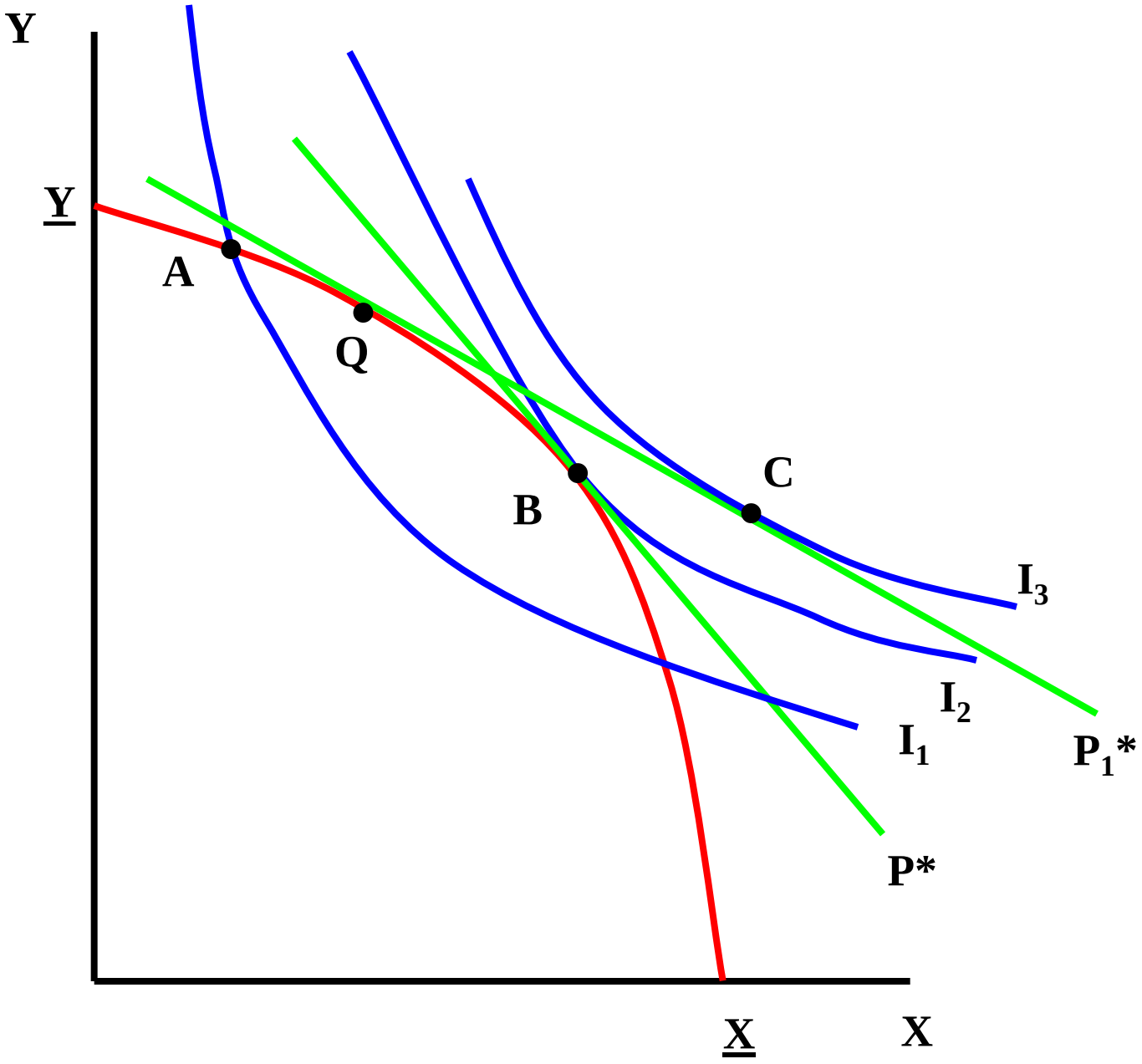
- **With trade, former monopolist faces a constant p_x^*, so MR = p_x^*, i.e. the perceived elasticity of demand is infinite, so monopoly distortion goes to zero**

- **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**

FIGURE 2: PRO-COMPETITIVE 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:**

$$MR_{xh} = p_x + X_h\{(dp_x/dX).(dX/dX_h)\} \qquad (9)$$

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

$$MR_{xh} = p_x + X_h\,(dp_x/dX) \qquad (10)$$

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

$$MR_{xh} = p_x + X_h/X\,\{X.(dp_x/dX)\} \qquad (11)$$

and then by p_x/p_x:

$$MR_{xh} = p_x + p_x.(X_h/X)\,\{(dp_x/p_x)/(dX/X)\} \qquad (12)$$

- **This is similar to the formula for a monopolist, except for the term (X_h /X) which is share of the home firm in total sales, i.e. $s_h = (X_h /X)$, so (12) is:**

$$MR_{xh} = p_x [1- s_h/e_x] = MC_{xh} \qquad (13)$$

- **Under Cournot, the firm's mark-up is given by 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)**

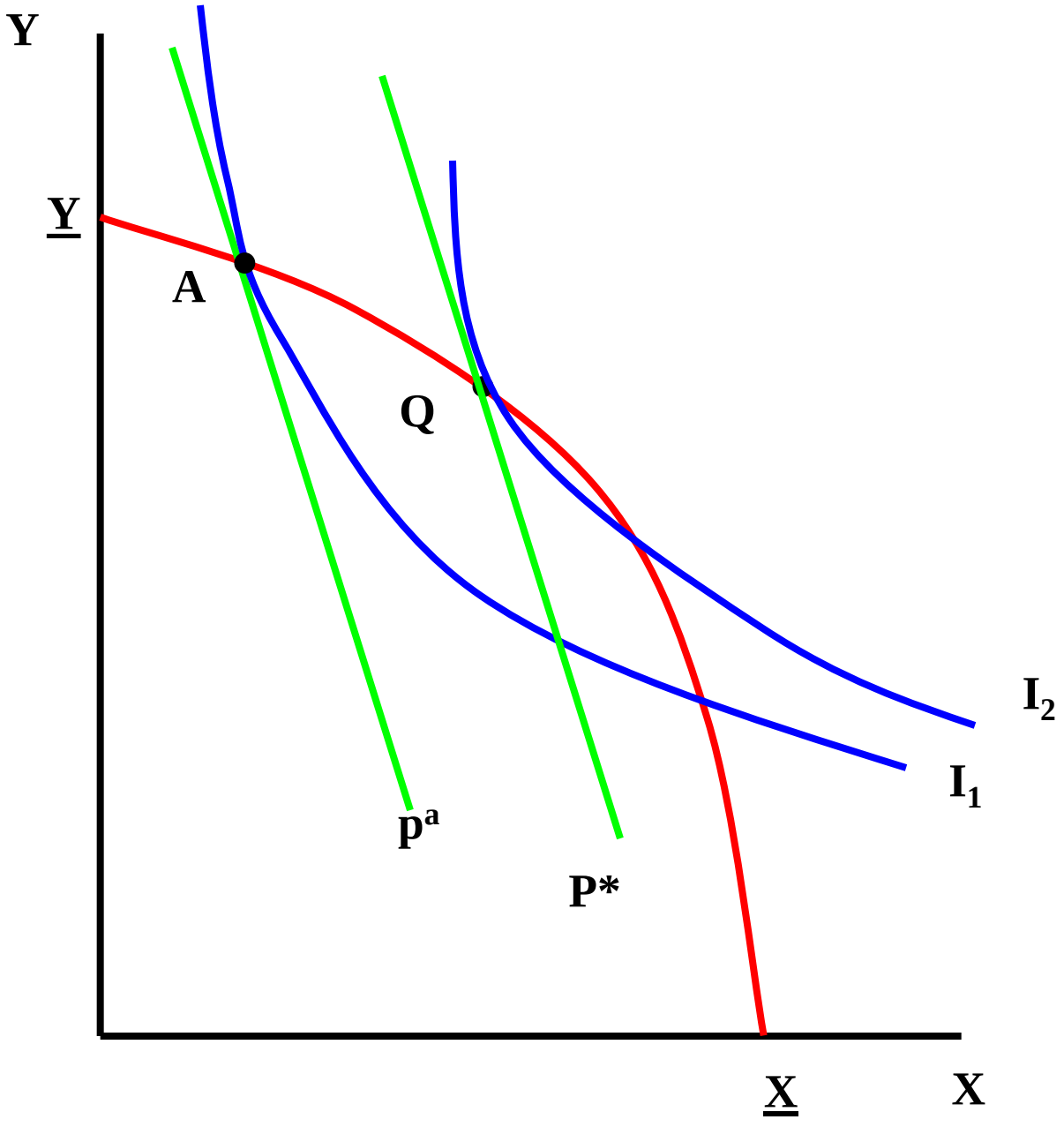
- **(13) proves formally that adding firms through trade makes demand facing any individual firm more elastic**

- **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**