

## The 'green box' How to draw diagrams accurately?

### Instructions for Tutors:

1. Before working with your group practice the drawing of an accurate diagram to show a firm with the following outcomes. (This is one example and other outcomes could be selected.)
  - 1) maximum profit ( $mr = mc$ )
  - 2) with supernormal profit ( $ar > ac$ )
  - 3) and productive inefficiency. ( $mc$  not equal to  $ac$  at lowest point)
  - 4) allocative efficiency ( $mc = ar$ ).
  - 5) What do you notice between the price and output at profit maximisation vs allocative efficiency price and output?
- 6) Now study the **5 tips** below to help you. Use the diagram below to identify these 4 key points in all diagrams for market power (in this case Monopolistic competition). Note that this diagram highlights the point of productive efficiency i.e.  $mc = ac$  at lowest point.
- 7) When you have mastered it then ask your group to complete the Tasks on page 3.

5 tips on how to draw accurate diagrams firms in monopolistic, oligopoly and monopoly. These are firms with market power and have downward sloping demand curves. See Diagram below for assistance.

## 5 Tips...

E.G. Decide what you want to draw. For example draw a firm (monopolistic) making supernormal (s/n) profits that is productively inefficient + allocatively inefficient):

1. Draw AR and AC
2. Add in MC cutting AC (at lowest point).
3. Select a max profit quantity of output on the X axis: label it Q Max Profit. Make sure it is NOT at the lowest point of AC as this example requires e.g. to left of lowest point on AC curve.
4. Using Q Max Profit highlight S/N profit where  $AR > AC$  (= S/N profit). Draw a parallelogram to show this supernormal profit. Add in the point of allocative efficiency where  $MC = AR$ .
5. Add in MR. It must match with where you have marked the profit maximising level of output (practice drawing this on a blank paper). Your diagram is now perfectly accurate. You can now analyse the firm (it can be a monopoly or oligopoly or monopolistic firm) in terms of supernormal profits, productive inefficiency and allocative efficiency.

Note: remember for PC and monopolistic:  $AC=AR$  in long run (normal profit)

Note: For PC  $ar = mr$  is drawn horizontal for PC as firm as no price power.

Note: Along the MC curve you should now see 3 key points:  $MR = MR$ .  $MC=AC$  (lowest point).  $MC = AR$ .

Note: This firm is productively and allocatively inefficient but it is making supernormal profits ( drawing the AR inelastic will highlight that the firm has a large area of supernormal profit. It can put its price up and increase total revenue.

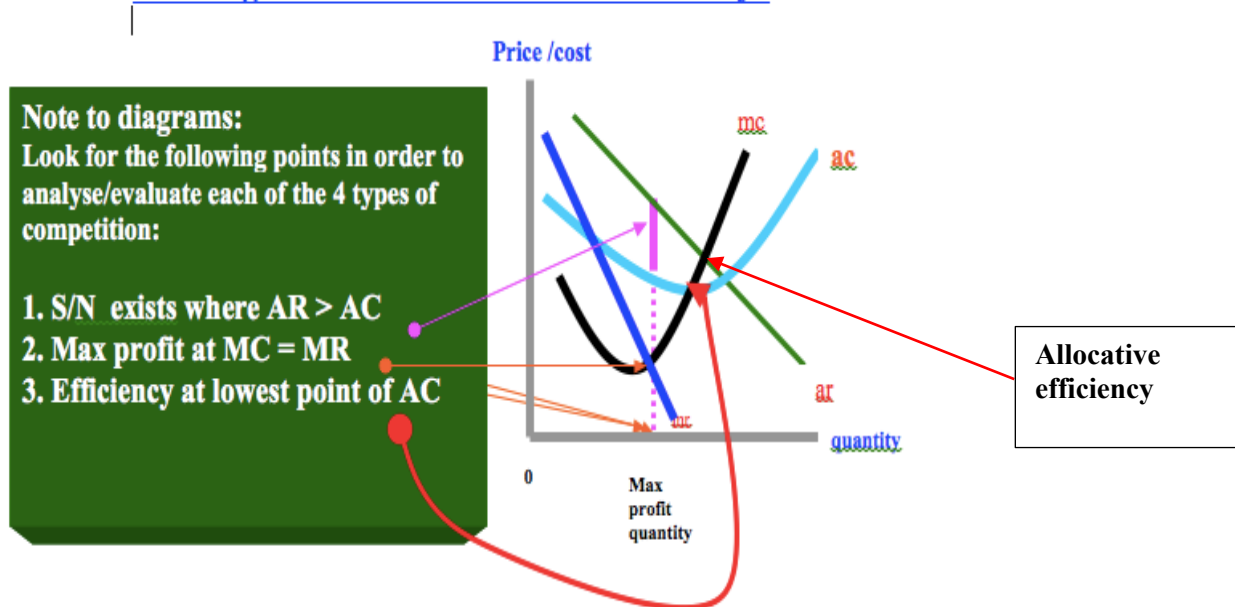
Note: Try the alternative 4 tips below. The important thing is to practice drawing the models to show exactly what the question is requesting you to analyse.

Alternative system: (experiment to see which you prefer and one of these will help you to draw the diagrams accurately- every time

1. Draw AR
2. Draw MR
3. Add in MC. Identify profit maximizing point where  $MC = MR$ .
4. Add in AC making sure that it meets the demands of the question. In this case the firm is productively and allocatively inefficient. Make sure that the MC is cutting the AC at its lowest point.

## Figure 1: 3 Key points for every market power diagram. See detailed version of diagram on page 4

### The Diagrams: How to draw them accurately?



See diagram on page 4 as it highlight all of the key points such as profit maximising price and output and the point of allocative efficiency.

## TASK SHEET

Approximate Duration **20 minutes**

Group Task Instructions: Peer tutors lead this exercise.

1. **(10 Minutes)** Without any assistance ask members of the group to draw a diagram for *monopolistic competition* showing a firm that is making supernormal profits and is productively and allocatively inefficient. Note carefully, the firm is a profit maximiser.

**Ask students to identify the following points on their diagram:**

2. profit maximisation
3. productive efficiency
4. allocative efficiency
5. profit maximising price for firm
6. profit maximising output
7. allocative efficiency output level
8. supernormal/abnormal profit

**When students have finished 1-8 then ask them to give feedback on tasks 9 + 10.**

9. can the firm make supernormal profits in the long run? Yes or No.
10. Is PED (price elasticity of demand) important and if so how does this influence how you draw the demand line? (Remember demand = AR)
11. **(10 Minutes)** Students will probably need to improve their diagram. Now take them through the 'Green Box'. Explain the 5 steps on page 1 to draw the diagram accurately to show supernormal profit and inefficiency for a firm in monopolistic competition. After you have explained the green box then ask them to repeat task 1 and redraw the diagram on a blank page.
12. **(5 Minutes)** Now ask students to complete task 1 again drawing the diagram on a blank page and accurately to complete the task 1 again. Use the diagram on page 4 to give them advice as they are working. Before they draw the diagram for a second time make sure they understand the significance of Task 10 above i.e. the AR curve should be drawn inelastic to show that the firm has price power i.e. firm can increase price and increase its Total Revenue (TR). This is a key sign that the firm has **price power** that the market is not price competitive. Note: this system can be used for different objectives to allow you to highlight e.g. efficiency, normal profit, market size, choice, possible barriers to entry, etc

**FIG1: price + output equilibrium for a firm in imperfect competition**

