

Revenue and Profits

We have seen the costs that each firm faces. Costs are the money going out of the firm. Now we will look at the money coming into the firm and also see what the owner (entrepreneur) can keep for himself.

There are many different types of revenue.

Total Revenue (TR): This is the total amount of payment received by the firm for providing its goods and services.

Mathematically

$$TR = P \times Q$$

Average Revenue (AR): is revenue per unit of output.

Mathematically

$$AR = \frac{TR}{Q}$$

$$\therefore AR = \frac{P \times Q}{Q}$$

$$\therefore AR = P$$

The AR curve is the demand curve faced by the firm. When you are drawing a firm's demand curve, you are also drawing its Average Revenue curve. They are one and the same.

Marginal Revenue (MR): is the extra revenue received by the firm for producing one extra unit of output.

Mathematically

$$MR = TR_2 - TR_1$$

Profit (π): Total Revenue - Total Costs

Profit is a residual payment. It is the reward to the entrepreneur for setting up the business. I.e. The entrepreneur gets what is left over.

Deciding what Quantity to Produce

Commercial businesses are set up by the entrepreneur in order to make a profit and the more profit the better.

In economics, we say that firms are profit maximisers. The entrepreneur wants to make the most money he can.

In order to do this he looks at two ideas that we have already discussed.

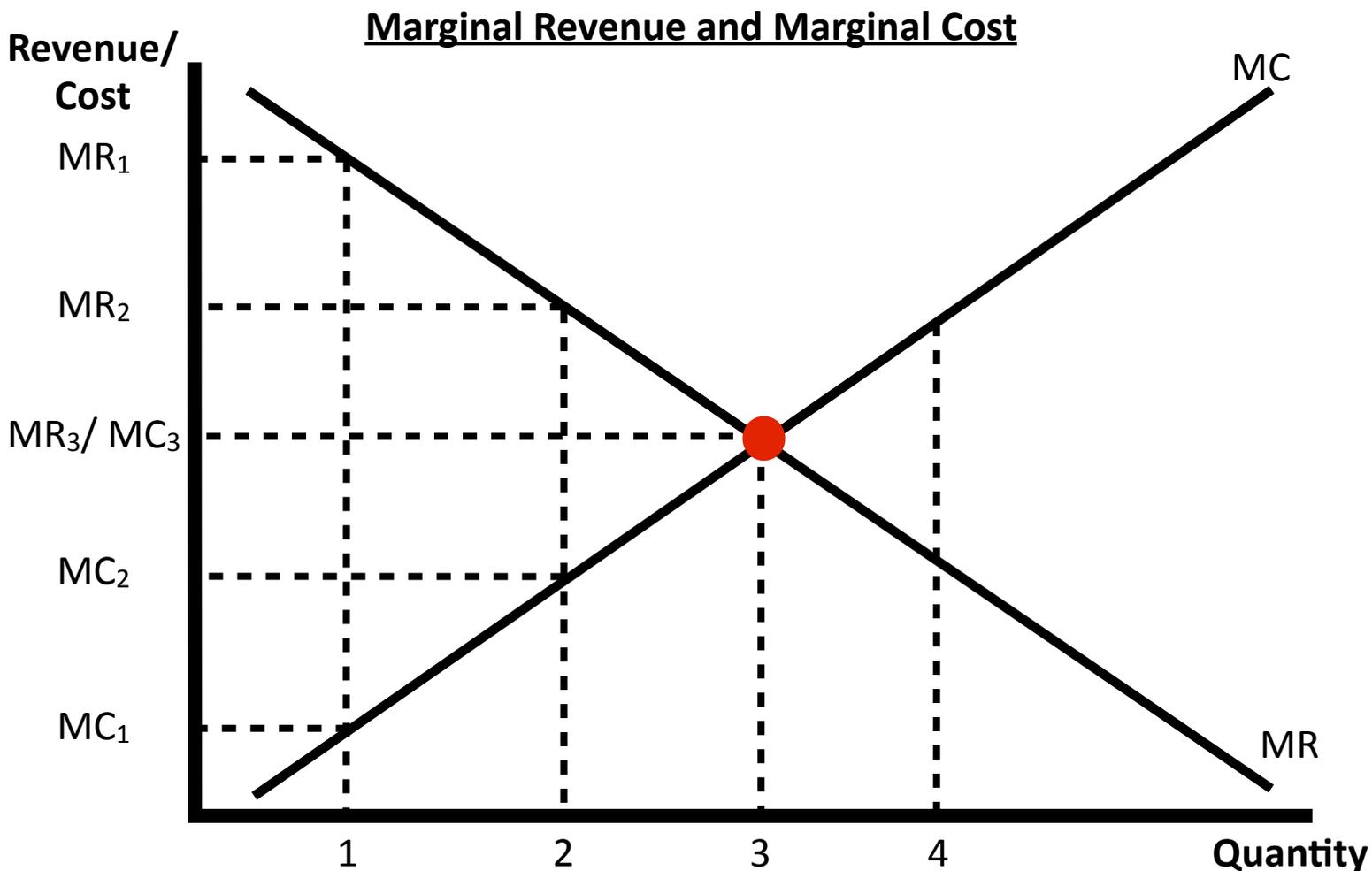
Marginal Revenue and Marginal Cost

Marginal revenue is the extra revenue received by the firm for producing one extra unit of output.

Marginal Cost is the cost, faced by the firm, of producing one extra unit of output.

If we go back to the example of the computer factory, Marginal Revenue is the amount of money the firm gets for making and selling one more computer. Marginal Cost is cost of making that one extra computer.

See the graph below.



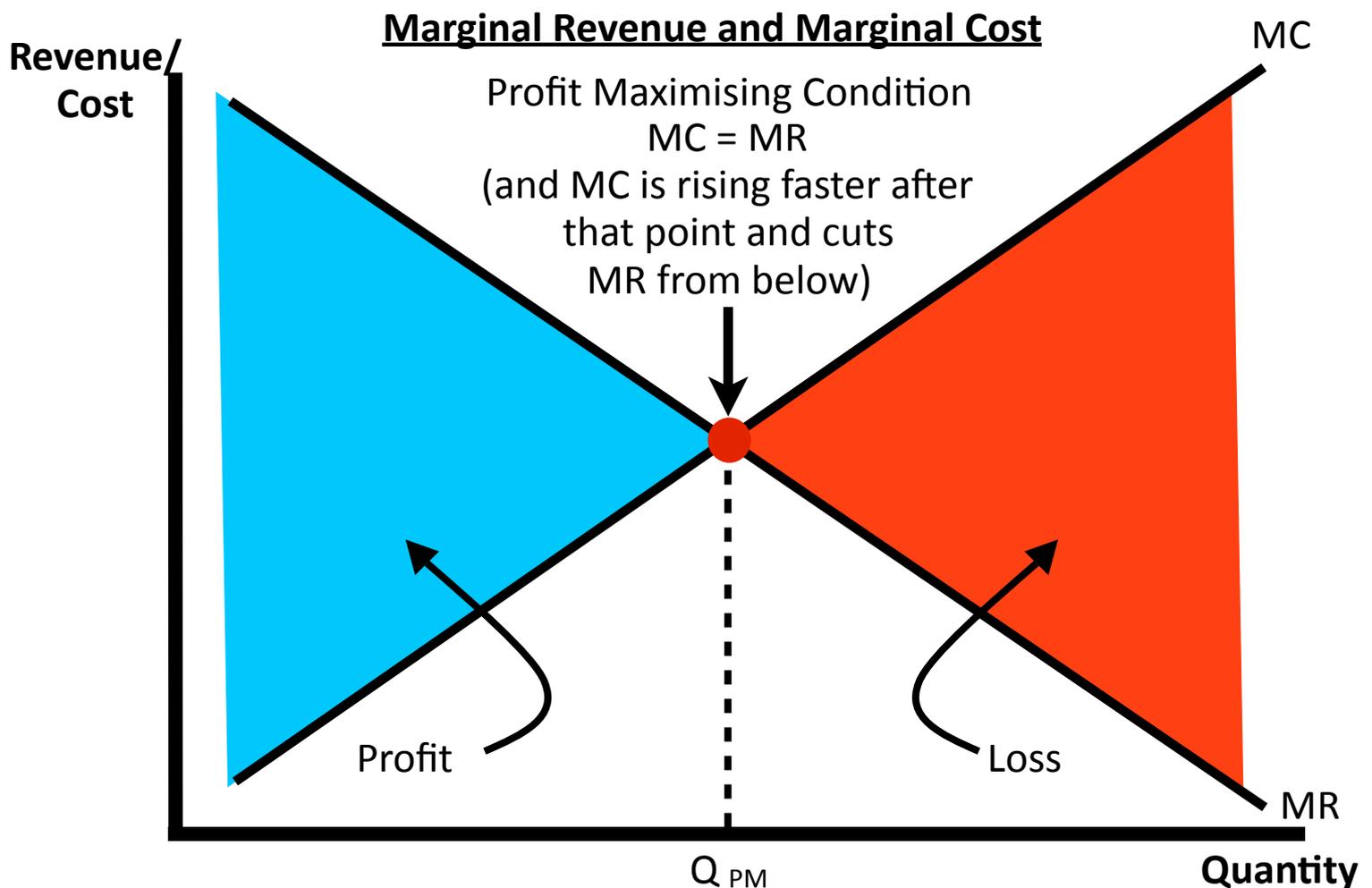
NOTE: The Marginal Revenue Curve has no definite shape but is usually a downward sloping straight line.

If the firm is producing one good, the extra money that the firm gets for this good (MR_1) is greater than the cost of making that good (MC_1). Therefore, the firm earns more money making that good than it costs them to make it and as such it chooses to make this good.

Having decided to produce the first good, the firm looks at the Marginal Revenue and the Marginal Cost of producing the second good. The extra revenue earned for producing the second good (MR_2) is greater than the cost of its production (MC_2) and as such they produce that good.

If the firm produces another good (good 3), the extra revenue earned (MR_3) is exactly equal to the cost of making this good (MC_3). The firm will make this good and now all possible profit has been exhausted.

If the firm produces another good (good 4), the cost of producing this good (MC) is greater than the revenue received by the firm for its production (MR). Therefore, the production of good 4 would cost the firm more to produce than it would receive in revenue and as such the firm would choose not to produce this good as it would make a loss on this good.



From the diagram overleaf we get the following properties.

- 1) If the firm is currently operating at a point where $MR > MC$ the firm will increase profits by increasing output.
- 2) If the firm is currently operating at a point where $MR < MC$ the firm will increase profits by reducing output.
- 3) The quantity of output (the amount of stuff that the firm should make) that the firm should produce in order to get the most amount of profit possible is the quantity where

$$MC = MR$$

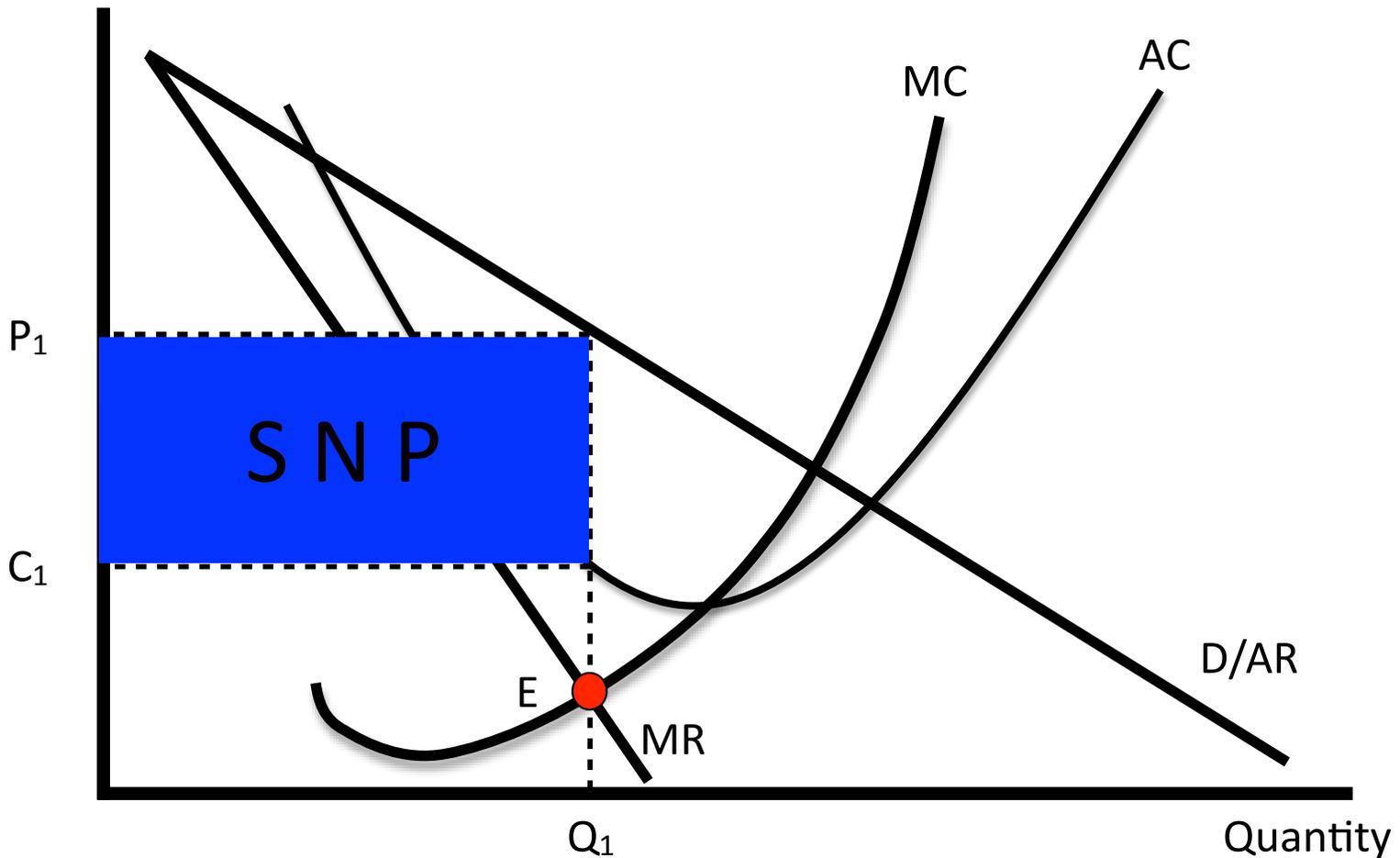
(and MC is rising faster after that point and cuts MR from below)

Profits

Now that we know the amount of output that the firm will produce (the level of output where $MC = MR$ and MC is rising faster after that point and cuts MR from below), we can tell what sort of profits they will earn by comparing the firms Average Revenue (AR) and their Average Cost (AC) curves.

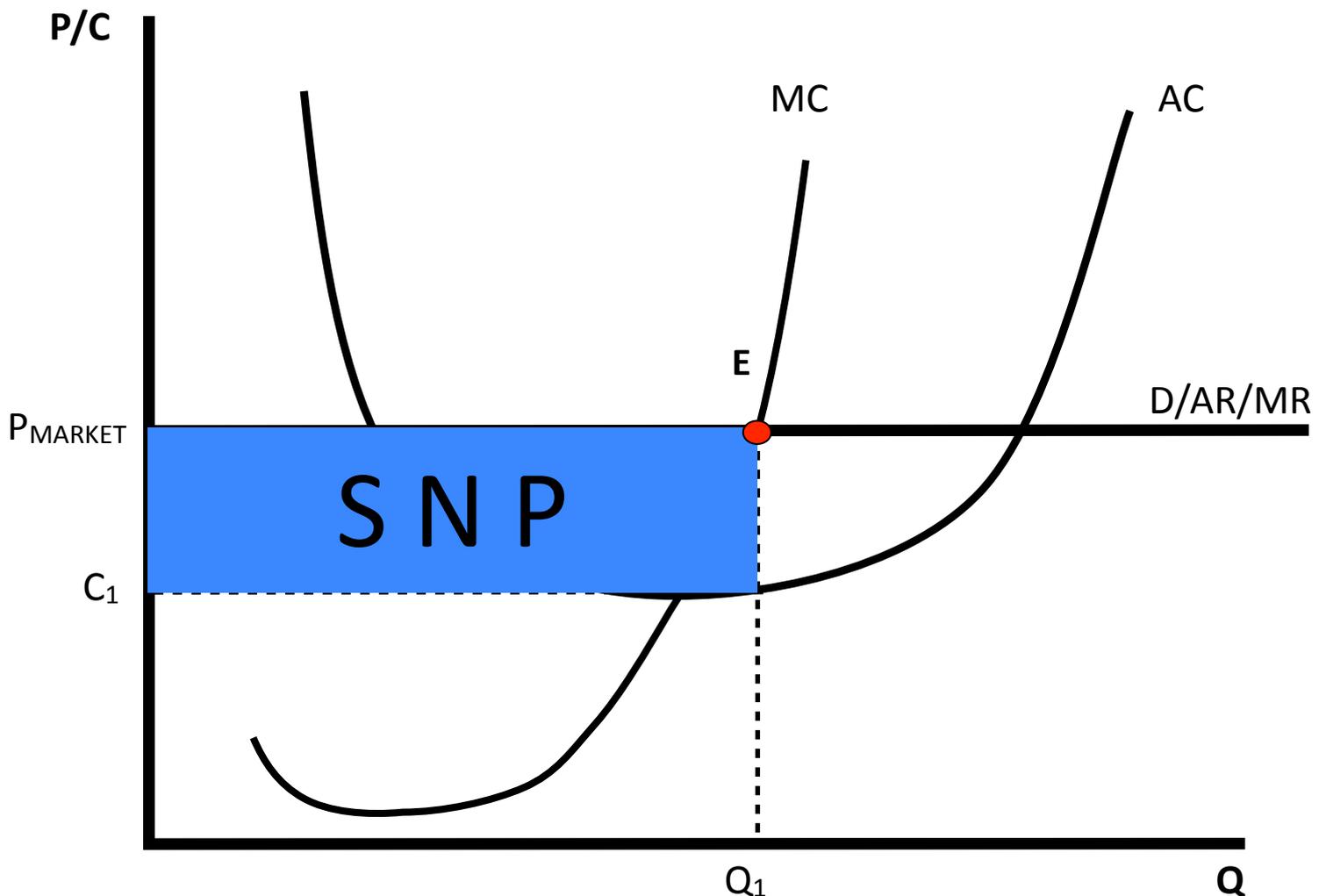
- 1) **Supernormal Profits (SNP)**: SNP are earned when the firm is producing where $AR > AC$. This is profit that is earned in excess of the minimum amount necessary to keep the firm in business in the Long Run (Normal Profit). They represent's an inefficiency in the market as the consumer is paying more for the good than is necessary.
- 2) **Loss**: a loss is made if the firm produces where $AR < AC$.
- 3) **Normal Profits**: Normal profits are earned when the firm is producing where $AC = AR$. A firm must earn at least Normal Profits if it is to stay in business in the long run.

Supernormal Profit with Downward Sloping Demand Curve



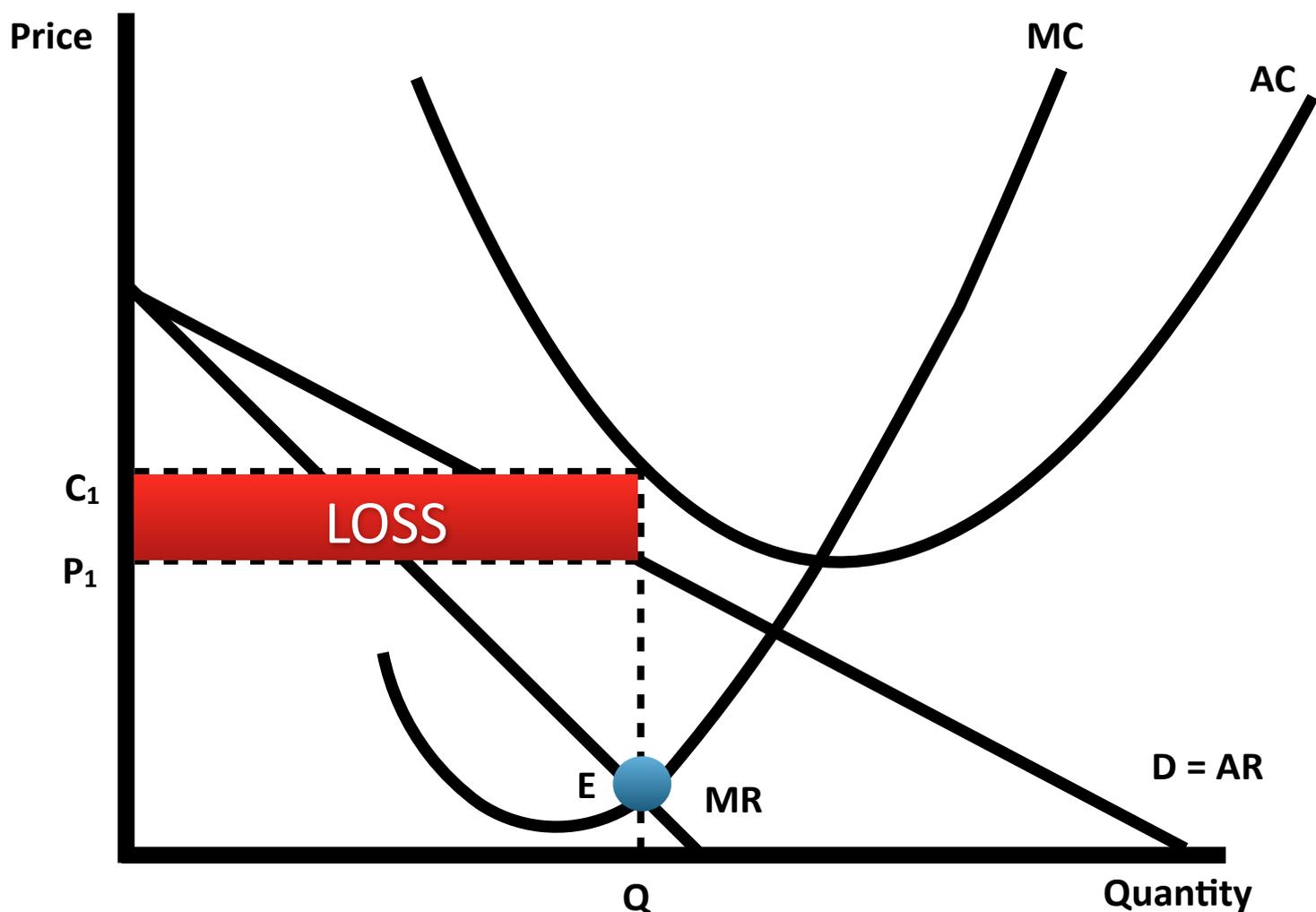
- 1) **Equilibrium:** Occurs at point E where $MC = MR$ and MC is rising and cuts MR from below.
- 2) **Price Charged & Output Produced:** The firm produces output Q_1 and sells it at price P_1 on the market
- 3) **Cost of production:** The cost of producing each unit of output is C_1 .
- 4) **Super Normal Profits:** This firm is earning SNP's – represented by the shaded area above. They are earning SNP's because $AR > AC$.
- 5) **Waste of Scarce Resources:** Because the firm is not producing at the lowest point of the AC curve it is wasting scarce resources. Also, the firm is earning a greater reward than is necessary to keep the firm in the industry in the long run (SNP).

Super Normal Profit with Perfectly Elastic Demand Curve



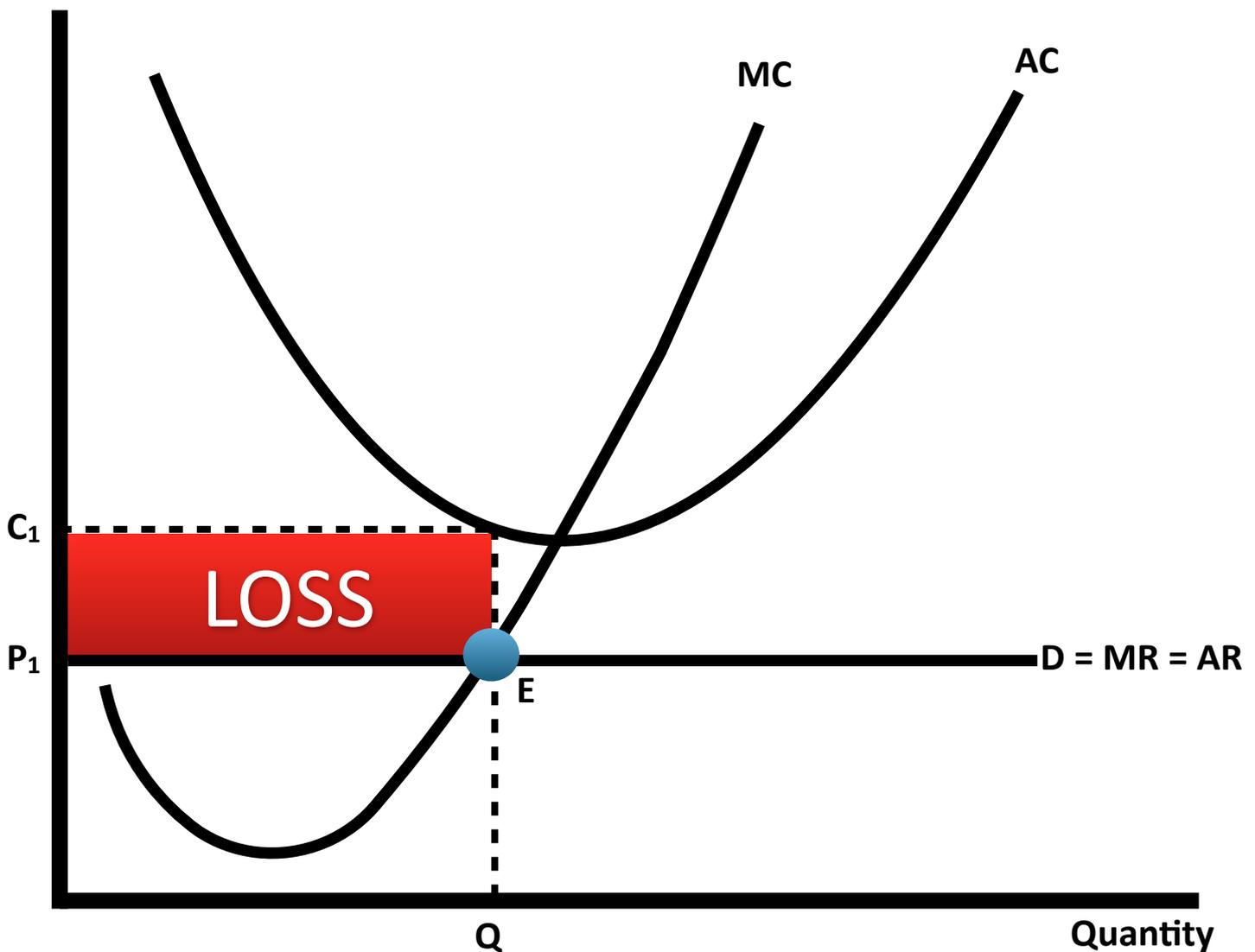
- 1) **Equilibrium:** Occurs at point E where $MC = MR$ and MC is rising and cuts MR from below.
- 2) **Price Charged & Output Produced:** The firm produces output Q_1 and sells it at price P_{MARKET} on the market.
- 3) **Cost of production:** The cost of producing each unit of output is C_1 .
- 4) **Super Normal Profits:** This firm is earning SNP 's – represented by the shaded area above. They are earning SNP 's because $AR > AC$.
- 5) **Waste of Scarce Resources:** Because the firm is not producing at the lowest point of the AC curve it is wasting scarce resources. Also, the firm is earning a greater reward than is necessary to keep the firm in the industry in the long run (SNP).

Loss with Downward Sloping Demand Curve



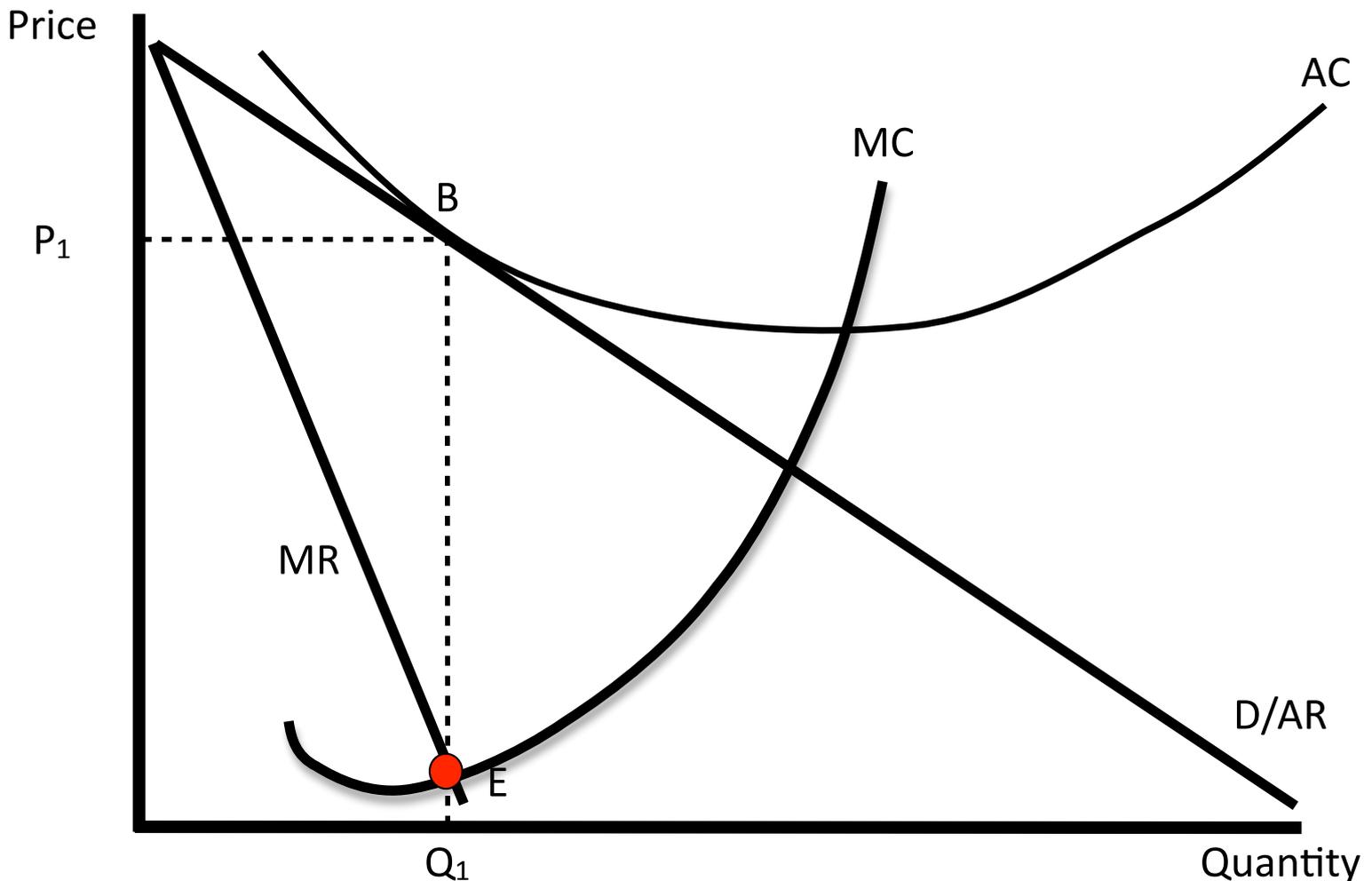
- 1) **Equilibrium:** Occurs at point E where $MC = MR$ and MC is rising and cuts MR from below.
- 2) **Price Charged & Output Produced:** The firm produces output Q_1 and sells it at price P_1 on the market.
- 3) **Cost of production:** The cost of producing each unit of output is C_1 .
- 4) **Loss:** This firm is suffering a loss – represented by the shaded area above. They are suffering a loss because $AR < AC$.
- 5) **Waste of Scarce Resources:** Because the firm is not producing at the lowest point of the AC curve it is wasting scarce resources. Also, the firm is using scarce resources and with these scarce resources is producing output valued less than the resources used to produce these inputs. The firm (loss) is making society poorer.

Loss With a Perfectly Elastic Demand Curve



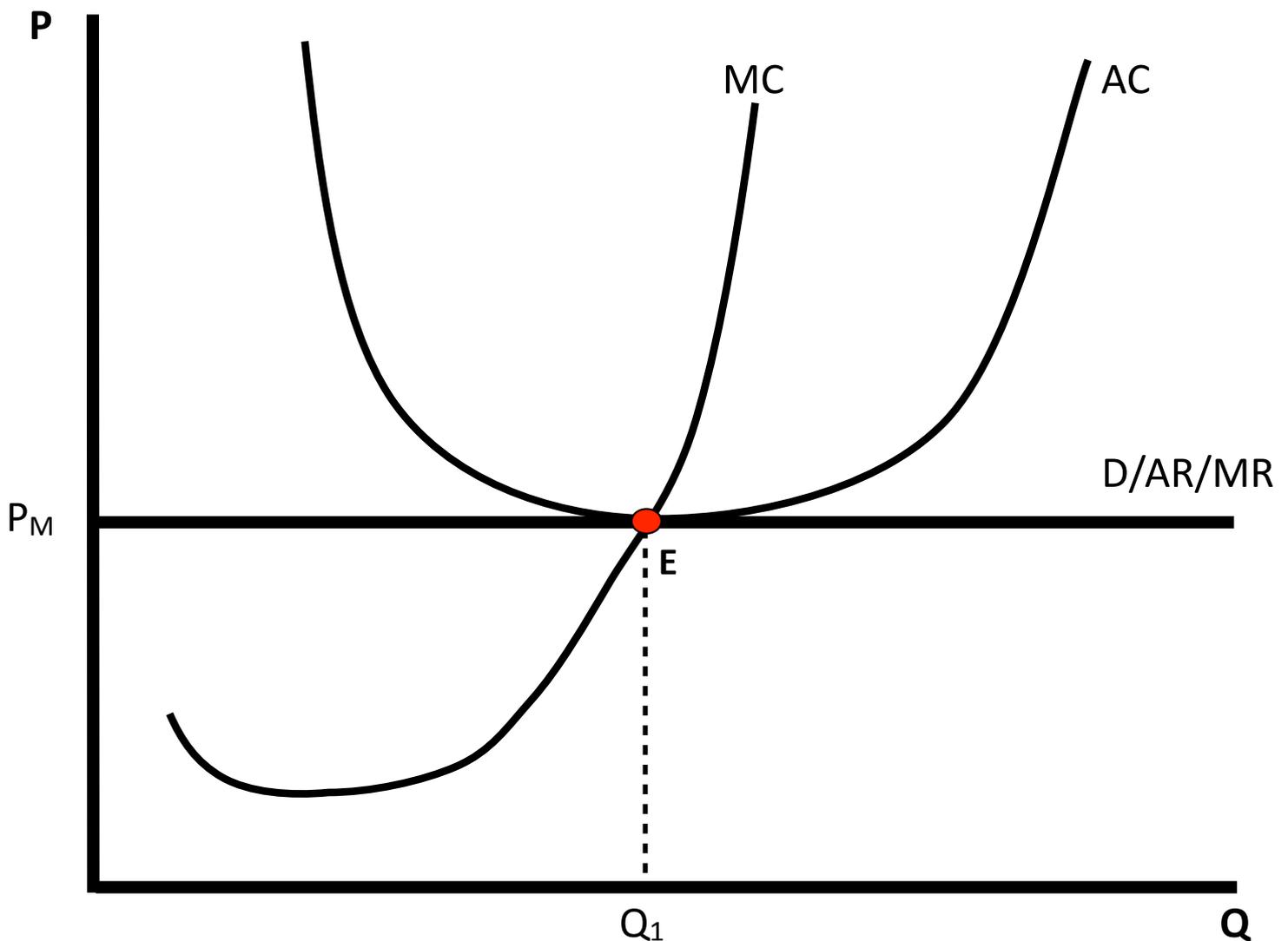
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Normal Profits with a Downward Sloping Demand Curve



- 1) **Equilibrium / Profit Maximisation:** occurs at point E where $MC = MR$ (MC is rising and cuts MR from below).
- 2) **Price and Quantity:** The level of output produced is Q_1 and the price the firm sells this output at is P_1 .
- 3) **Costs:** The average cost of production is shown at point B.
- 4) **Profit:** This firm is earning normal profits because $AR = AC$.
- 5) **Efficiency:** The firm is not producing at the lowest point of AC curve this indicates that the firm is wasting scarce resources.

Normal Profit with a Perfectly Elastic Demand Curve



- 1) **Equilibrium / Profit Maximisation:** occurs at point E where $MC = MR$ (MC is rising and cuts MR from below).
- 2) **Price and Quantity:** The level of output produced is Q_1 and the price the firm sells this output at is P_M .
- 3) **Costs:** The average cost of production is shown at point E.
- 4) **Profit:** This firm is earning normal profits because $AR = AC$.
- 5) **Efficiency:** The firm is producing at the lowest point of AC curve which shows that the firm is making the best use of its scarce resources. The firm is producing at the most efficient level of output possible.

Economics Profit V's Accounting Profit

Looking at the last two diagrams where the firm earned Normal Profit, it might seem unusual that any entrepreneur would continue to operate a business where there is no money left over for the entrepreneur to keep for himself. If Average Revenue equals Average Cost ($AR = AC$), then the entrepreneur is just covering his costs and has nothing to keep for himself. That doesn't make any sense, people start a business to make money. So why is this the case?

To understand exactly how much money the entrepreneur gets to keep when Normal Profit is being earned, we have to distinguish between "Accounting Profit" and "Economic Profit".

Accounting Profit: Total Revenue minus Total Explicit Costs

Explicit Costs: are input costs that require an outlay of money by the firm

Economic Profit: Total Revenue minus Total Costs, including both Implicit and Explicit Costs.

Implicit Costs: input costs that do not require an outlay of money by the firm

Opportunity Costs: Is the cost of forgone alternatives

Explanation of Accounting Profit V's Economic Profit

Sometimes people need to readjust their thinking as to what costs mean in economics. From an accounting standpoint, cost refer to direct or out-of-pocket or explicit costs. In other words, what do I, the business owner, pay for the resources that I use to produce my product. Accounting costs are explicit costs.

This means that some accounting standpoint profit is total revenue minus explicit costs where Total Revenue can be found by taking the number of units sold times the price charge for each unit.

$$\begin{array}{r}
 \text{Total Revenue} \\
 - \text{Total Explicit Costs} \\
 \hline
 \text{Accounting Profit}
 \end{array}$$

An economist however would tell you that you're omitting a critical component. What about the value of the resources you already own that could be used elsewhere? For Example, your labor goes in your business but you could sell that labour couldn't you we have a name for these implicit or indirect costs, Opportunity Costs.

Opportunity Costs: Is the cost of forgone alternatives

Economic Cost do of course include the explicit or accounting costs but also the implicit or opportunity cost. So economic costs are both explicit and implicit costs. From an economic standpoint then, profit is going to be the total revenue minus the explicit cost but then also subtracting the implicit costs.

$$\begin{aligned} & \text{Total Revenue} \\ & - \text{Total Explicit Costs} \\ & - \text{Total Implicit Costs} \\ \hline & \text{Economic Profit} \end{aligned}$$

The question you might have is, does this distinction really matter? The answer is yes. Failure to consider the implicit or opportunity cost could lead you to a faulty conclusion in considering choices.

Consider this. A small farmer sells wheat. He manages to grow 20 bushels of wheat which he can sell for €5 per bushel. This means of course that is total revenue is €5 times of 20 bushels or €100.

The farmers explicit cost of production are €40. Remember that explicit cost are the direct cost of purchasing resources. What might this €40 represent? Maybe seeds, irrigation, machinery or workers. What's the farmers accounting profit than? Accounting profit is the total revenue minus the explicit cost

$$\mathbf{€100 - €40 = €60}$$

So in this case you have €60 of profit. The farmers happy when his accountant tells him that he's earning \$60 of profit. However, then an economist that he knows tells them that he's forgotten something. What about his opportunity cost?

Suppose that the farmer could be working in town at the local burger joint for €5 an hour. For every hour he spends farming he sacrifices €5 salary elsewhere so if for example farming took three, eight hour long days for total of 24 hours his implicit cost would be €5 an hour times the 24 hours it took him to grow the wheat for €120.

What's the farmer's economic profit? Economic profit is a total revenue minus the explicit and implicit costs.

Total Revenue	€100
- Total Explicit Costs	- €40
- Total Implicit Costs	- €120
Economic Profit	- €60

He is actually losing €60. From an economic standpoint, the farmer is losing money and therefore, assuming as we are, that all producers are interested in maximizing profits, he would be better off working at the local burger joint.

One last note, zero economic profit is also known as a normal profit. If you find a business owner is making a zero economic profit it doesn't mean that he is earning nothing. It means that revenues are enough to cover all of your costs even the value of the owner's time that could be spent elsewhere doing his next best paying job.

Three Farming Examples

Suppose that there are three farmers, Andrew, Brian and Conor. They have set up their farms next to each other and their farms are exactly the same size. All three farmers are growing oats and their farming ability is exactly the same. This means that they can expect to receive exactly the same amount in revenue from their farming.

Also, they all hire one worker each, they buy the same amount of oats, water and fertiliser. Finally they each pay a sub contractor to harvest the oats. Each of these **EXPLICIT COSTS** are the same. If, for the year they each earned €50,000 and their explicit costs (like the ones mentioned above) were €20,000, then their Accounting Profit is €30,000.

Andrew	Brian	Conor
€50,000	€50,000	€50,000
-€20,000	-€20,000	-€20,000
<hr/>	<hr/>	<hr/>
€30,000	€30,000	€30,000

Looking at these set of numbers above, from an accounting standpoint, they are all making an accounting profit of €30,000 each and as such are all earning the same amount of accounting profit.

However, lets suppose that each of the worker have the following skills which pay the following amounts.

Andrew is a qualified accountant and as such could earn €80,000 a year working for KPMG.

Brian has been a qualified barista and could earn €30,000 working for Starbucks.

Conor, has only ever farmed in his life and as such his next best employment would be in Tesco's earning €22,000 per year.

With this in mind, lets look again at profit being earned by these gentlemen and now calculate the **Economic Profit** that each of them are earning.

<u>Economic Profit</u>		
Andrew	Brian	Conor
€50,000	€50,000	€50,000
-€20,000	-€20,000	-€20,000
-€80,000	-€30,000	-€22,000
<hr/>	<hr/>	<hr/>
-€50,000	€0	€8,000

Looking at the three different economic profits listed above, we see a very different story than we did when we just looked at the accounting profit. As Andrew has given up an accounting job which would pay him €80,000 a year, the opportunity cost (or implicit cost) of farming is very

high. Therefore, very unlike the accounting profit, the economic profit is actually an economic loss, like we see in the previous diagrams on pages 8 and 9. This means that Andrew would be better off (from a financial point of view), leaving farming and going into accountancy.

Brian on the other hand has an economic profit of zero, which is the normal profit we have seen on the previous diagrams on pages 10 and 11. In this case, Brian is earning the exact same through farming that he would earn through working in Starbucks. If his income from farming fell, he would be materially or financially better off leaving his farm and working for Starbucks.

Conor, who was earning an accounting profit of €30,000, is earning Super Normal Profit of €8,000. That means he is earning an economic profit of €8,000. This is the situation we see in the diagrams on pages 6 and 7. If Conor was to leave his farming job and take up employment in his next best alternative employment opportunity (Tesco's), then he would be €8,000 worse off.