

ECO 182: Summer 2015 Supply

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Making a Supply Decision

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1. **Information** about its production process

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5. **Information** about its potential customers (Preferences, demand)
6. **Information** about other institutions. (Government, Political parties, Trade Unions)
7. **Information** about the state of the world
 - ▶ Is there a war coming?
 - ▶ Will it rain a lot soon?
 - ▶ Will there be a civil/political unrest?

How Much to produce, how many inputs to hire ?

We shall focus on points (1) and (2) for now.

If the firm knows about (1) and (2), then it can find its **PROFIT**.

There are two basic types of Profit : *Economic* and *Accounting*.

Accounting Profit: The money a firm makes by producing a certain level of quantity, by subtracting its total explicit costs from its total revenue.

Economic Profit: The money a firm makes by producing a certain level of quantity, by subtracting its total explicit costs **and** implicit costs from its total revenue.

Some Definitions

- ▶ **Explicit Costs:** The costs incurred by a firm from inputs it doesn't own to produce something.
- ▶ **Implicit Costs:** Opportunity Cost of operating a business... looks at the OC of using inputs it already has.
- ▶ **Revenue:** The amount of money a firm receives by selling some output in the market.
- ▶ **Marginal Revenue:** Extra revenue earned from selling one extra unit of an output.
- ▶ In Economics, the standard symbol denoting Profit is Π (Π : Pronounced as "Pie").

Example of Economic and Accounting Profit

Eve Smith owns a warehouse. She employs 7 workers for a week and produces 10 text books on Economics. Each book sells for \$20 in the market after production is complete. Each worker needs to be paid \$10 for the entire week. Furthermore, Miss Smith had the option of leasing the warehouse out to Miss Carol Marks for the week for \$ 50. Miss Marks would have produced 10 books on Politics, and employed 10 workers. Miss Marks would have paid the workers \$30 for the week. The books on Politics would have sold in the market at the rate of \$50 per book. Curiously, if Miss Marks didn't want to go into the business of producing books, she could have been the President of Utopia. Being President of Utopia, would have given Miss Marks a value of \$100. Production of any book needs workers and warehouse.

Calculating Revenue, Cost and Profit

1. Revenue of Miss Smith:
2. Cost(**Explicit**) of Miss Smith:
3. **Accounting Profit** of Miss Smith:
4. OC(**Implicit Cost**) of Miss Smith:
5. **Economic Profit** of Miss Smith:

OR

1. Revenue of Miss Marks:
2. Cost(**Explicit**) of Miss Marks:
3. **Accounting Profit** of Miss Marks:
4. OC(**Implicit Cost**) of Miss Marks:
5. **Economic Profit** of Miss Marks:

What is the comparison between Economic and Accounting Profit?

ECONOMIC PROFIT

ACCOUNTING PROFIT



Another Example

Output	Labour	MR(\$)	MC(\$)	TVC	AVC	Extra Π	Total Π
1	1	15	3	3	3	12	
2	3	15	6	9	4.5		21
3	5	15	6	15	5		
4	7	15	6	21	5.25		39
5	9	15	6	27	5.4	9	48
6	13	15	12	39	6.5		51
7	17	15	12	51	7.2	3	
8	22	15	15	66	8.25		
9	29	15	21	87	9.67		
10	40	15	33	120	12	-18	

Q: What is the Price per unit for this output?

Q: What is the cost of hiring labor here?

Another Example...continued

- ▶ Typically the firm produces till that unit after which it will earn only negative extra Π .
- ▶ The motive of the firm is to Maximize its *Profits*.
- ▶ So easiest way to figure out how much the firm wants to produce is to find out which level of output gives the *Maximum Π* .
- ▶ In the last example, what was the Maximum Profit?
- ▶ Which level of output generates this Maximum Profit?

If the manager of this firm is rational, how much should he/she produce?

- ▶ What if the price of this good was \$21 per unit?
How much would the firm produce now?
- ▶ What if the price was \$2 per unit ? Now what happens ?

Supply Decisions

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- ▶ Once again, the firm makes this decision by looking at its profit.

Shutdown Condition

Consider a firm that produces **Q** units of output and sells it at **\$P** per unit of output. The firm incurs **\$TVC** as the variable cost of producing these **Q** units and **\$FC** as the fixed cost of production.

1. Profit of the Firm if it operates:

$$\Pi_{operate} = P * Q - TVC - FC$$

2. Profit of the Firm if it shuts down:

$$\Pi_{shutdown} = - FC$$

3. The firm produces when,

$$\Pi_{operate} \geq \Pi_{shutdown}$$

$$\implies P * Q - TVC - FC \geq - FC$$

$$\implies P * Q - TVC \geq 0$$

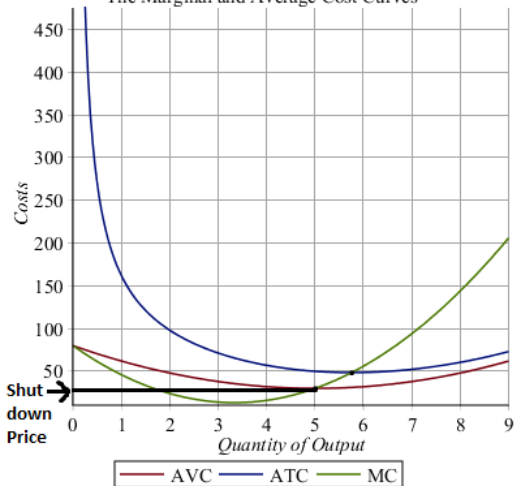
$$\implies P * Q \geq TVC$$

$$\implies P \geq \frac{TVC}{Q}$$

$$\implies P \geq AVC$$

Shutdown Price

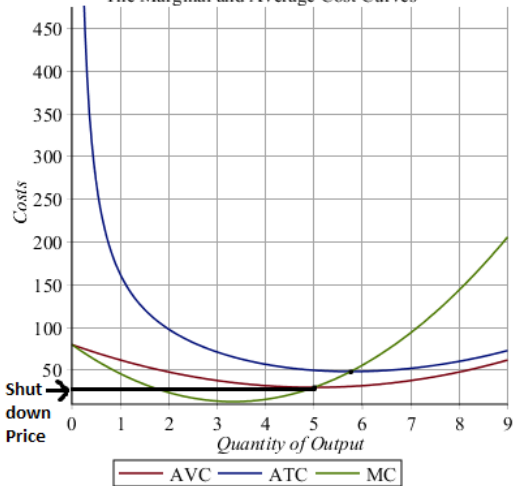
The Marginal and Average Cost Curves



- ▶ The firm stops production if the price for the good in the market is **below** the shutdown price.

Shutdown Price

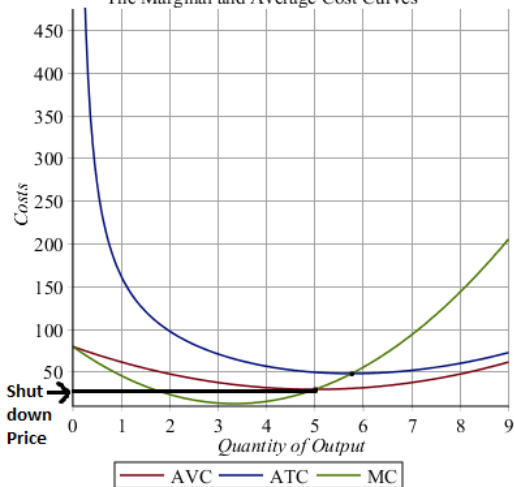
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- ▶ For a price below the shutdown price, it would be profitable for the firm to cease production, and do nothing!

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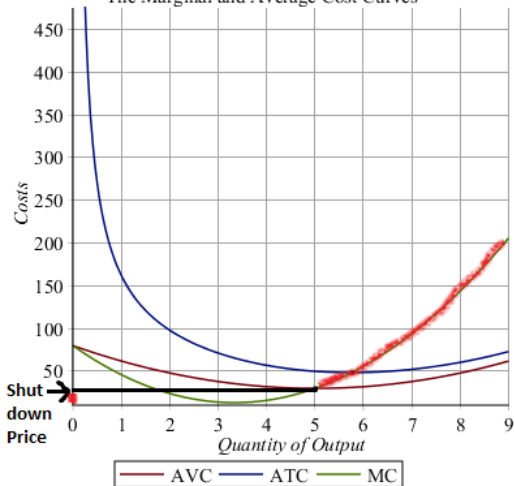
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- ▶ The firm stops production if the price for the good in the market is **below** the shutdown price.
- ▶ For a price below the shutdown price, it would be profitable for the firm to cease production, and do nothing!
- ▶ Formally, the Shutdown price is the minimum value of AVC i.e. the minimum point on the AVC curve.

MC, AVC to Supply

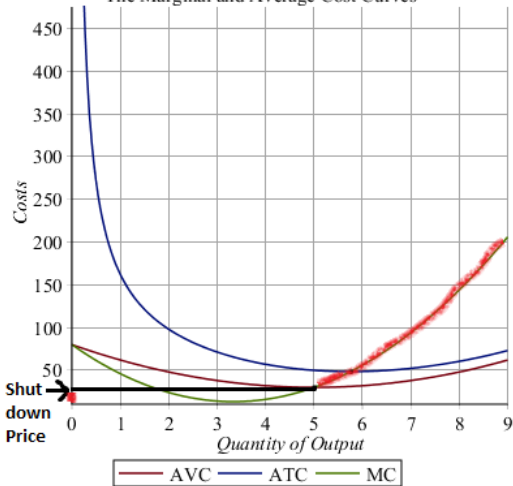
The Marginal and Average Cost Curves



- ▶ Firm supplies nothing if price is below Shutdown Price.

MC, AVC to Supply

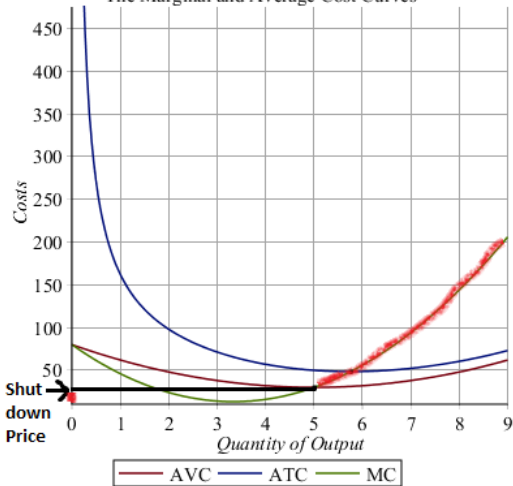
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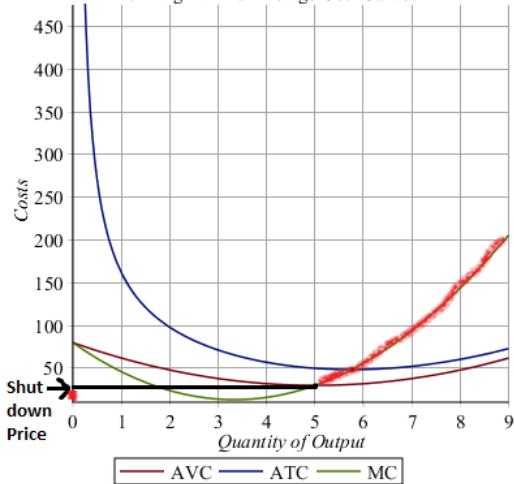
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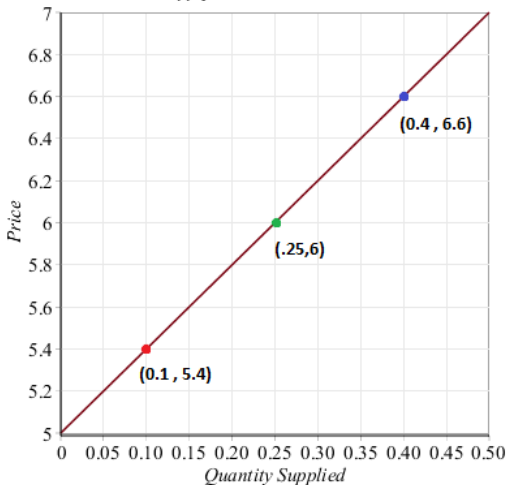
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- ▶ Focal point of our analysis will involve the upward rising portion of the Supply curve.

Supply Curve

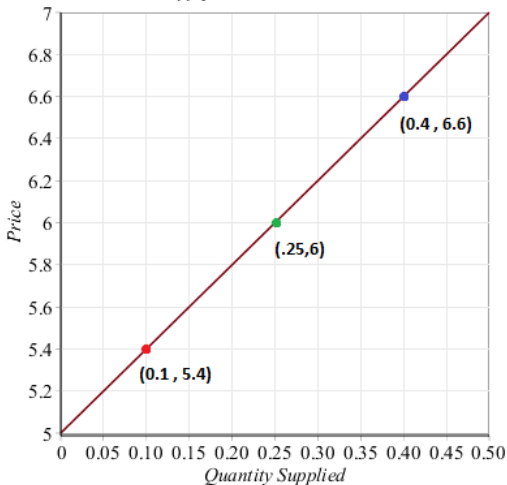
Supply Curve for a Good



- ▶ The Quantity supplied rises when the Price rises from \$5.4 to \$6.

Supply Curve

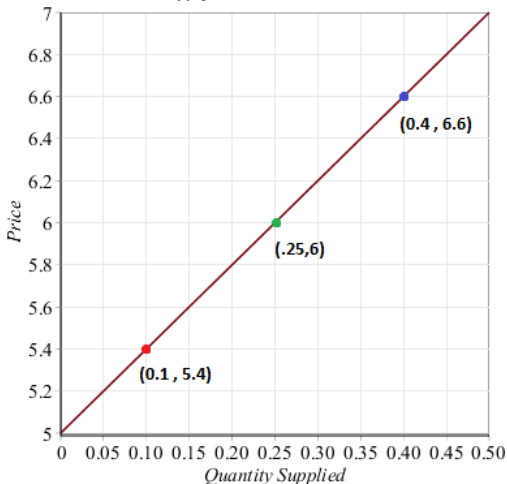
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- ▶ Each point on the horizontal axis (under the curve of course) denotes a quantity that is supplied.

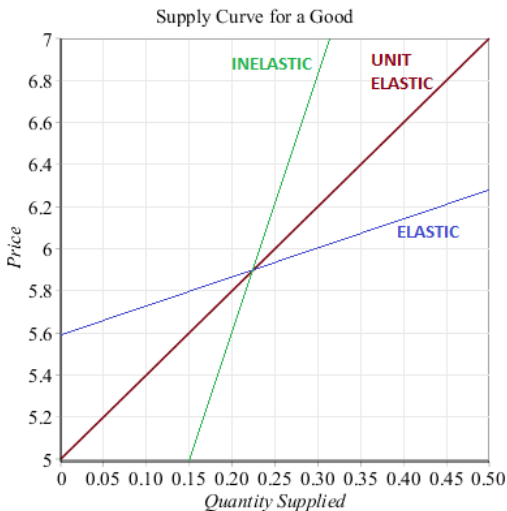
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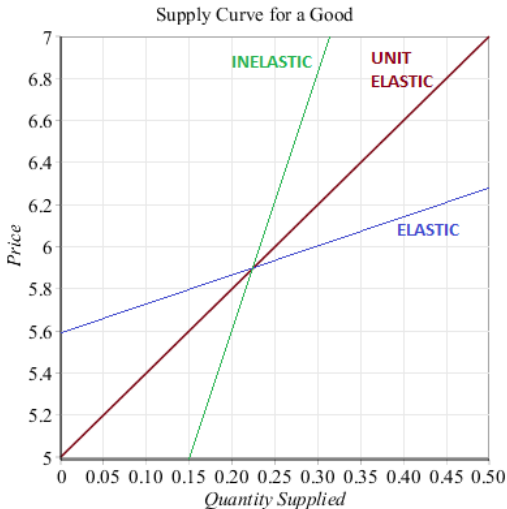
- ▶ The Quantity supplied rises when the Price rises from \$5.4 to \$6.
- ▶ Each point on the horizontal axis (under the curve of course) denotes a quantity that is supplied.
- ▶ Each Price corresponding to a value of quantity supplied is the *Minimum Price the producer is willing to accept for that quantity supplied.*

Price Elasticity of Supply



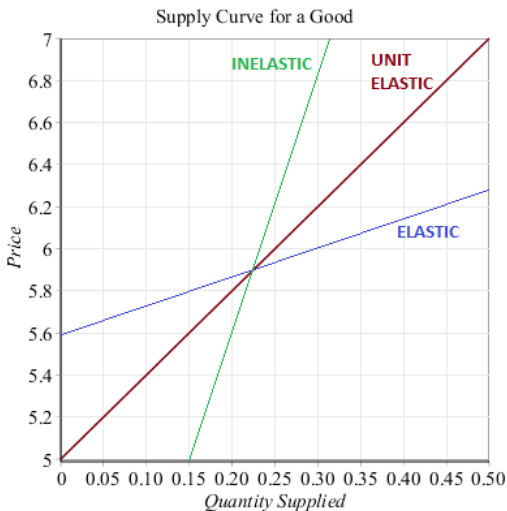
- $PES = \frac{\% \Delta \text{Quantity Supplied}}{\% \Delta \text{Price}}$; We will consider positive PES.

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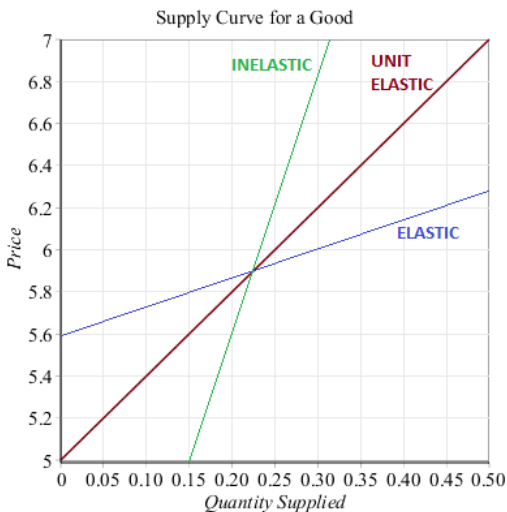
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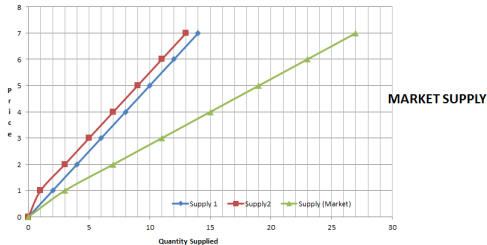
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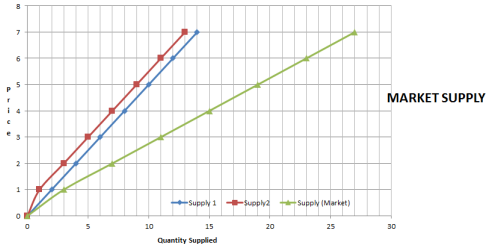
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- ▶ *Flatter* Supply curve is more elastic than a *Steeper* Supply curve.
- ▶ For a Supply Curve passing through the origin the PES is always = 1.
- ▶ Elasticity = 1 means unit elastic. So PES = 1 means *unit elastic supply*, PED = 1 means *unit elastic demand* (absolute value of course for ordinary goods, for PED).

Market Supply Curve



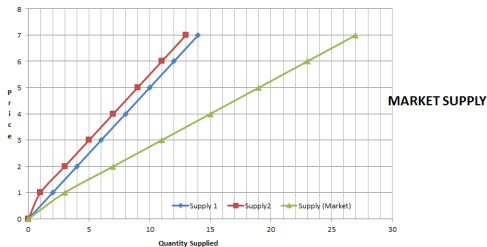
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Market Supply Curve



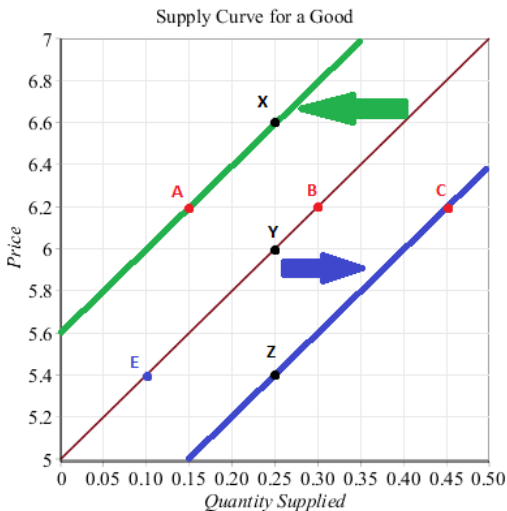
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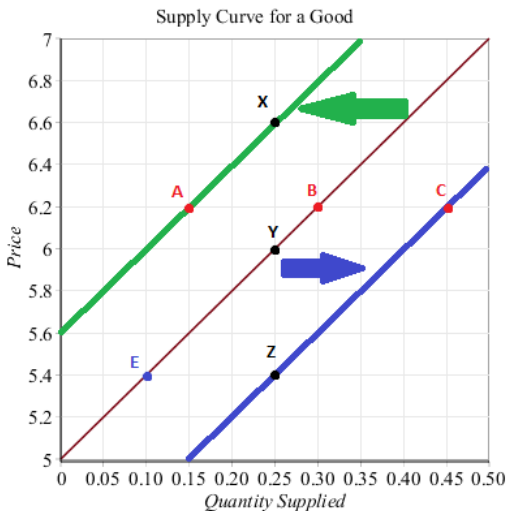
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- ▶ Take a value of Price. Find the quantity supply for each firm at that price and add up. This gives the market supply at that price. Repeat for all admissible prices.
- ▶ When number of firms in a market goes up(down), the market supply curve *shifts* right(left).

Movement along and shift of the Supply curve



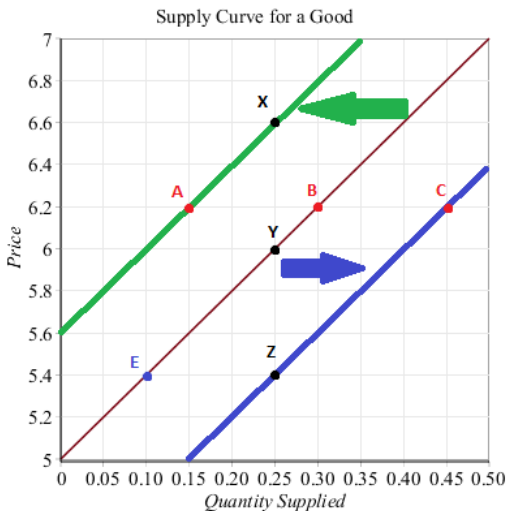
- ▶ A change in the price of the good leads to a *movement along the supply curve*. Look at points Y , B, E. *Quantity Supplied changes*.

Movement along and shift of the Supply curve



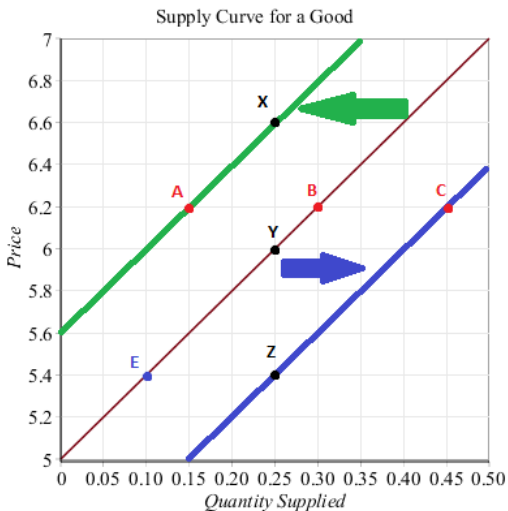
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- ▶ Example: Tornado hits the factory. Supply falls

Many firms, one industry

Think about the coffee industry. There are many firms which sell coffee. How many do you have on this campus?

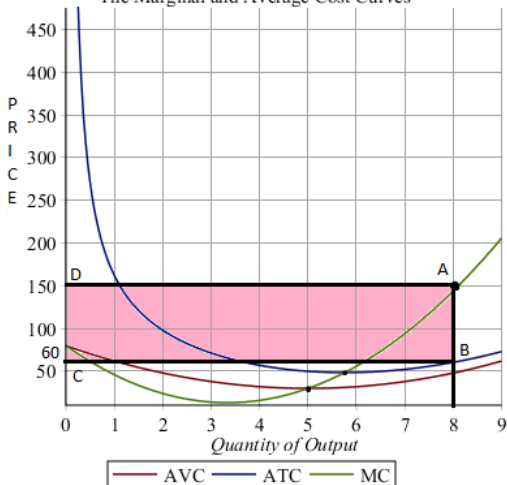
When does a firm decide to enter a market (or an industry)? In other words, when does a firm decide to set up shop and start production?

According to economic theory, if there is more than one firm, they will compete against each other by cutting prices, advertising..such that they each make almost zero profit.

No incentive for an outside firm to enter...*unless* there is **SUPERNORMAL** Profit.

Normal and Supernormal Profit

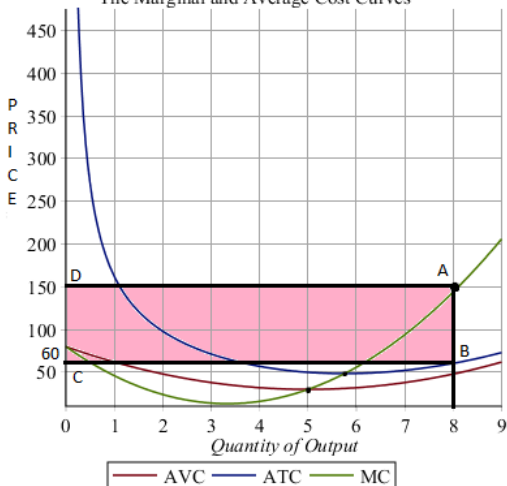
The Marginal and Average Cost Curves



- ▶ When the price at the quantity supplied is above ATC the firm makes *Supernormal Profit*.

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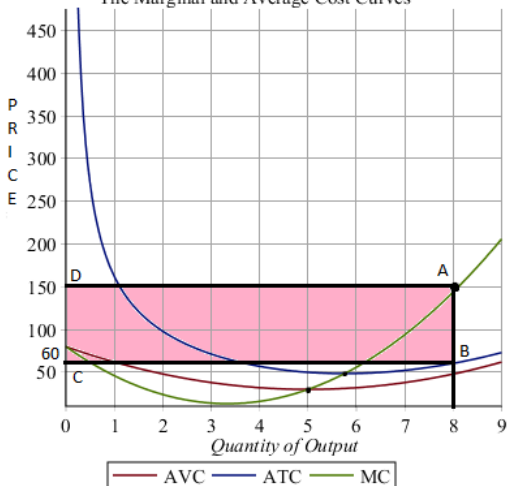
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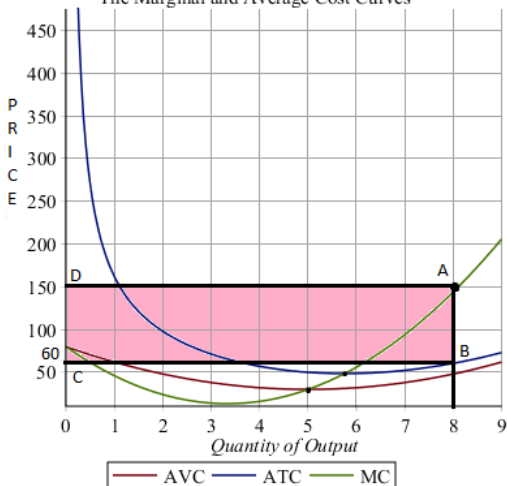
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- ▶ In the picture, if the market price is \$ 150 for the 8 units of output, there is supernormal profit (the pink area...rectangle ABCD).

Normal and Supernormal Profit

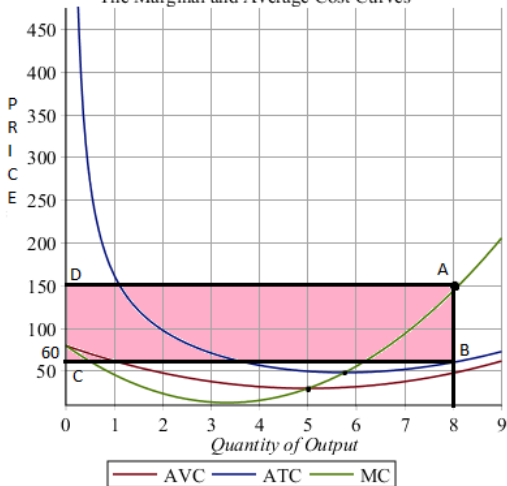
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- ▶ In the picture, if the market price is \$ 150 for the 8 units of output, there is supernormal profit(the pink area...rectangle ABCD).
- ▶ If the price for 8 units is \$60, there is normal or zero profits.

Entry

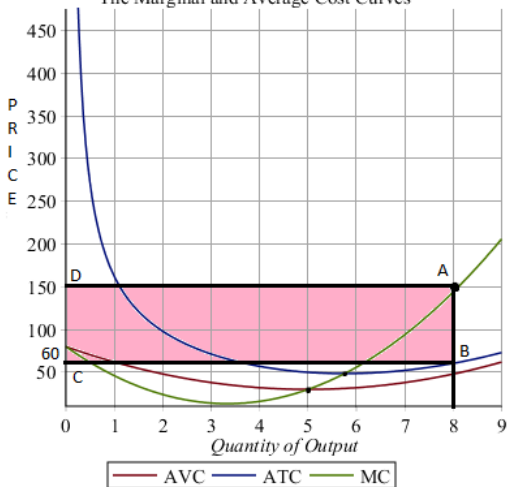
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- ▶ Will the firm wish to sell 8 units at \$60? No, because, the price is lower than MC. The firm has no incentive to produce them.

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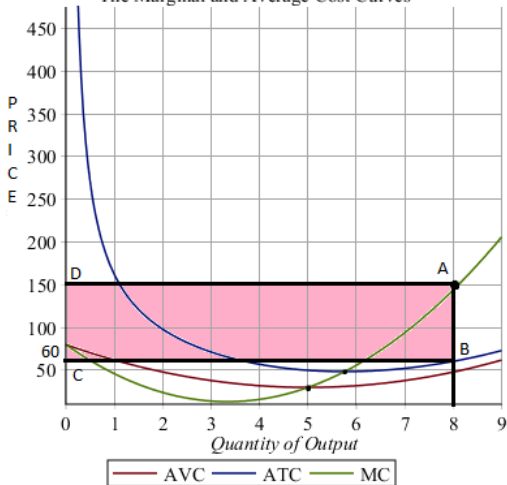
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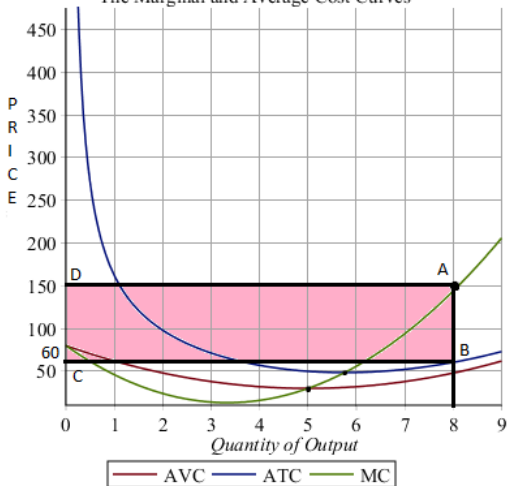
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- ▶ Free entry happens in an industry which has supernormal profits.
- ▶ Entry of firms means market Supply shifts right and Price falls. Firms will cut back on production as the price falls.

Exit

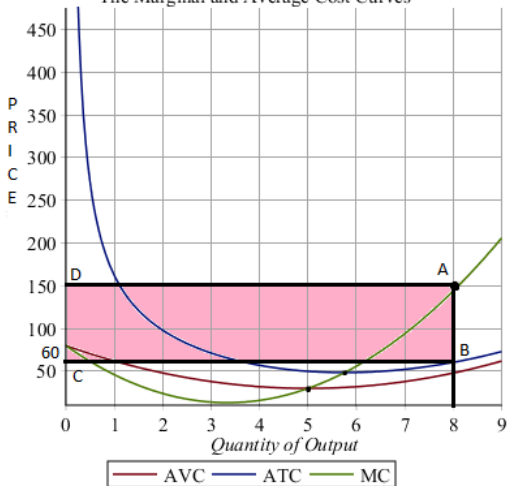
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- ▶ If too many firms enter then we might find the price going below the lowest value of AVC (which is called the shutdown price). Then some firms shut down. They might exit the market if this continues till Long Run. Exit of firms will push up the price above Shutdown point.

Exit

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- ▶ Eventually entry and exit will lead to firms settling with Normal Profits in the Long Run.