

# 2.2 Supply



# **Learning objectives**

2.2 Supply	Depth	Diagrams & calculations
<ul> <li>The law of supply—relationship between price and quantity supplied</li> <li>Assumptions underlying the law of supply (HL only)</li> <li>The law of diminishing marginal returns</li> </ul>	AO2	
<ul> <li>Increasing marginal costs</li> </ul>		
Supply curve	AO4	Diagram: upward-sloping supply curve
Relationship between an individual producer's supply and market supply	AO2	



# **Learning objectives**

2.2 Supply		Diagrams & calculations
Non-price determinants of supply	AO2	
<ul> <li>Changes in costs of factors of production (FOPs)</li> </ul>		
<ul> <li>Prices of related goods (in the cases of joint and</li> </ul>		
competitive supply)		
<ul> <li>Indirect taxes and subsidies</li> </ul>		
Future price expectations		
Changes in technology		
Number of firms		
Movements along and shifts of the supply curve	AO2	Diagram: movements along
	AO4	and shifts of the supply curve





## What is supply?

**Supply** is concerned with the behaviour of firms (producers) and refers to the quantities of a good or service that producers are willing and able to supply at different prices in a given time period.





### **Real world example**

Video: <u>How the Tesla Model S is Made</u>

What are some factors that could affect Tesla's ability to produce the Model S?



## **Individual supply**

A firm's supply for a good can be presented by a supply schedule.

#### Charlotte's Chocolate Factory's supply schedule for chocolate bars

Price of chocolate bars (\$)	Quantity of chocolate bars supplied (per week)
\$5	600
\$4	500
\$3	400
\$2	300
\$1	200



## **Individual supply**

We can plot the supply schedule on a graph with price on the vertical axis and quantity on the horizontal axis. This is a **supply curve**.

Price of chocolate bars (\$)	Quantity of chocolate bars supplied (per week)
\$5	600
\$4	500
\$3	400
\$2	300
\$1	200



### Individual supply to market supply

Suppose there are four firms in a market for candy bars. The **market supply** is the sum of each individual firm's supply at given prices.

Price of candy bars (\$)	Firm 1's Quantity of candy bars supplied	Firm 2's Quantity of candy bars supplied	Firm 3's Quantity of candy bars supplied	Firm 4's Quantity of candy bars supplied	Total quantity of candy bars supplied
\$5	60	110	50	100	320
\$4	50	90	40	80	260
\$3	40	70	30	60	200
\$2	30	50	20	40	140
\$1	20	30	10	20	80

### Individual supply to market supply

**Market supply** shows the total quantity of a good or service that firms are willing and able to supply in the market at different possible prices, ceteris paribus.





Stockx.com/watches is an online marketplace where buyers and sellers trade watches. We can use real market data to construct a supply curve for any watch.





**Step 1**: Visit <u>stockx.com/watches</u> and select a watch of your choice.



**Step 2:** For your chosen watch, select "View Asks". This shows the various prices at which potential sellers are willing and able to sell the watch. Using this data, create a supply schedule for the lowest 5 price points. You will need to calculate the cumulative quantity supplied as the price increases. For example:

Bid price	# Available
\$1,020	1
\$1,040	1
\$1,050	1
\$1,080	1
\$1,090	3

Price (\$)	Quantity supplied
1,020	1
1,040	2
1,050	3
1,080	4
1,090	7



**Step 3:** Using your supply schedule, create a supply curve. Label your axis with the appropriate titles and units.

**Step 4:** Describe the relationship between price and quantity supplied of your chosen watch.



DW6900PF-1 - 45mm in Resin Price (\$) Quantity supplied

Level7 Education

Supply of Casio G-Shock × Places + Faces

## The law of supply

The **law of supply** states there is a positive relationship between the price of a good and its quantity supplied over a particular period, ceteris paribus.

Price (\$)



What might explain this relationship?



Supply of Casio G-Shock × Places + Faces DW6900PF-1 - 45mm in Resin

Quantity supplied



Assuming all else is equal:

**Higher prices** generally mean that producer profits increase, and so existing firms face an incentive to increase output, while new firms are attracted to enter the market.

Lower prices generally mean lower profitability, so firms have less incentive to produce, thus output decreases.



# Assumptions underlying the law of supply (HL only)

#### The law of diminishing marginal returns

**The law of diminishing** returns states that when additional variable factors of production are employed to fixed factors, the marginal returns will eventually decrease. This occurs in the short run, as at least one factors of production is fixed, usually capital.



The **short run** is the period when there is at least one fixed factor of production. The **long run** is the period when there are no fixed factors of production.



# Assumptions underlying the law of supply (HL only)

#### The law of diminishing marginal returns - Example

- Assume a firm employs workers (variable factors) and machines (fixed factors).
- i. Additional workers are employed at first



ii. More workers employed



- Better division of labour
- Machines fully utilized
- Improved efficiency and productivity
- Marginal returns for each additional worker **increases**
- Additional worker has fewer or no fixed factors to use
- Efficiency and productivity of additional worker decreases
- Higher production cost
- Marginal returns for each additional worker decreases



# Assumptions underlying the law of supply (HL only)

#### **Increasing marginal costs**

Marginal cost is the cost of producing an additional unit of output.

Marginal cost increases as output rises, due to diminishing marginal returns. Firms are only willing to increase output when prices increase in order to cover the higher marginal costs.





Supply shows the quantities of a good or service that producers are willing and able to supply at different prices during a particular time period, **ceteris paribus**.



What other factors are we assuming remains constant?

In other words, what other factors, aside from price, can influence supply?



**Non-price determinants of supply** are factors that may influence the willingness and ability of producers to supply a good and/or service. This includes but is not limited to:

- S Subsidies and taxes
- T Technology
- Other related goods' price
- **R** Resource costs
- **E** Expectations (of producers)
- S Size of the market





#### **Subsidies and indirect taxes**

**Subsidies** are financial aids provided by the government to producers to encourage output.



**Indirect taxes** are government charges on producers to discourage output.





#### **Changes in technology**

Advances in technology increase efficiency and productivity, thereby lowering average costs. Supply of goods and services increase at every price level, shifting the supply curve to the right.

For example, e-commerce allows firms to operate at a lower unit cost as hosting a website is cheaper than renting a physical retail outlet.





#### **Competitive supply**

A farmer produces both tomatoes and potatoes using shared resources of land and labour.

How would an increase in the price of tomatoes sold impact the supply of potatoes?



Price of tomatoes increases

 $\rightarrow$  More profitable to produce tomatoes

Farmer allocates more land and labour to harvest tomatoes



Supply of potatoes decreases

 $\rightarrow$  Supply curve shifts left



#### **Competitive supply**

A farmer produces both tomatoes and potatoes using shared resources of land and labour.

How would an increase in the price of tomatoes sold impact the supply of potatoes?





#### **Competitive supply**

When two goods are in **competitive supply**, the output of one good is limited by the production of another good due to competing resources. As producers have scarce resources, they cannot produce more of one good without producing less of another.



Brainstorm:

Can you think of other examples of goods in competitive

supply?



#### **Joint supply**

A farmer produces both mutton and wool from sheep. How would an increase in the price of mutton sold impact the supply of wool?



Price of mutton increases

 $\rightarrow$  Increase in quantity supplied

More sheep for mutton means an increase in the supply of wool



Increase in supply of wool

→ Supply curve shifts right



#### **Joint supply**

A farmer produces both mutton and wool from sheep. How would an increase in the price of mutton sold impact the supply of wool?





#### **Joint supply**

When two goods are in **joint supply**, the increase in production of one good increases the supply of another good. As the supply of the main product changes, the supply of its by-product changes in the same way.



Brainstorm:

Can you think of other examples of goods in joint supply?



#### **Resources costs**

Costs of production including wages, rent, interest, and profit, are negatively correlated with supply.

For example, an increase in the minimum wage may reduce the supply of agricultural producers (due to the higher costs of production).





#### **Expectations of producers**

Price has a signaling effect in allocating resources to produce goods. There is a positive correlation between future price expectations and the supply of the good.

For example, if an airline company expects demand for flights to worsen during a recession or pandemic, they may decrease the number of flights offered.







#### Size of market

There is a positive correlation between the number of firms in a market and the market supply of a product.

For example, as there is an increasing number of IB schools around the world, there is a corresponding increase in the market supply of international educational programmes.



### **Real World example**

Article: Face mask shortage sparks global race to fulfill orders

How did 3M increase its supply of face masks?



# **Shifts in supply**

- Changes in non-price determinants of supply cause shifts in the supply curve.
- An outward (rightward) shift of the supply curve (from S1 to S2) indicates that more quantity is supplied at all prices.

 An inward (leftward) shift of the supply curve (from S1 to S3) indicates that less quantity is supplied at all prices.



### **Movements vs Shifts**

**Movements** along a supply curve are due to price changes, causing *changes in quantity supplied*.

Shifts in a supply curve are due to changes in nonprice determinants, causing *changes in supply*.



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## Over to you...

Hoang, Wray, & Chakraborty (2020)

Economics for the IB Diploma Programme

- Page 65
- Paper 1 Exam Practice Question 4.1
- [10 marks]
- Paper 1 Exam Practice Question 4.2
- [10 marks]







### Test your knowledge on this unit: <u>Kahoot!</u>

