

## A Brief Review on Microeconomics Principles

### Part I Demand and Supply Analysis

Today, Most countries are market economies where prices are determined by two interacting forces demand and supply for the market of a specific product. Therefore, in this part, the main question we want to answer is how does the interaction of demand and supply determine the price of a product. Before answering this question, let's take a close look at the relationship between price and demand (supply).

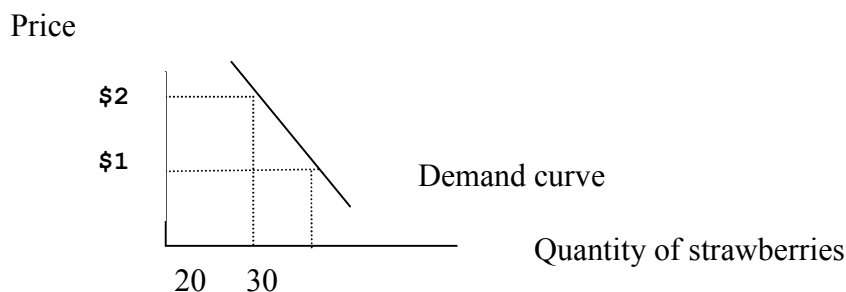
#### Question 1: why is demand curve downward sloping?

**Answer: Law of Demand**

**Explanation:** Economists use the term *demand* to indicate *willingness to buy*. While the demand for a product depends upon many different factors, one obvious determinant is price. Price has a negative effect on willingness to buy. All else equal (**ceteris paribus**), as the price of a product falls, the quantity demanded will rise. This is called *Law of Demand*.

**Graphics:** We draw a *demand curve* to show the relationship between the price of the good and the quantity that consumers are willing to buy. For example, suppose people are willing to buy 20 pounds of strawberries at a price of \$2, but are willing to buy 30 pounds if the price falls to \$1. The relevant demand curve is drawn below. Because a change in price will push the quantity demanded in the opposite direction, most demand curves will have a negative slope.

**Graph 1: Demand curve in the market of strawberry**



#### Question 2: What would shift the demand curve?

**Answer: All the possible demand shifters**

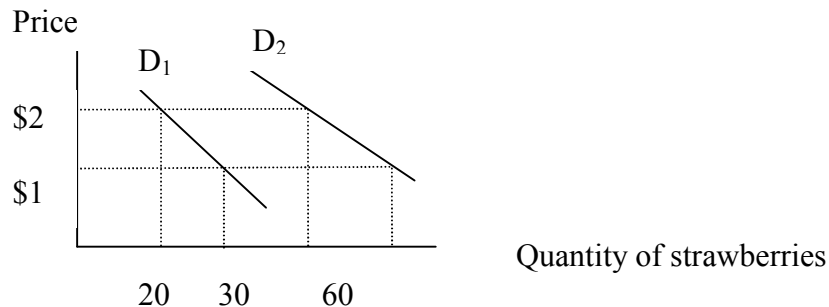
**Explanation:** Of course, the price of good is not the only factor that impacts willingness to buy. Other important factors include:

1. Consumer tastes and preferences (or the perceived value of the product)
2. Consumer income
3. Prices of substitute and complementary goods  
Note: Substitute goods can be used in place of one another (like corn and peas); complementary goods are used together (like cars and gasoline).
4. Consumer expectations

5. Number of potential consumers in the market or population

These factors often are called *demand shifters*. If any of them changes, the entire demand curve will move or *shift*. For example, suppose new research indicates that eating strawberries will make you more attractive to members of the opposite sex. Will consumers react to this news? Of course. It will change the perceived value of strawberries and increase the quantity of strawberries people are willing to buy *at every price*. Using the above numbers, suppose this new research triples the quantities people are willing to buy at each price. In other words, consumers are now willing to buy 60 pounds (rather than 20) at the \$2 price and 90 pounds (rather than 30) at the \$1 price. The demand curve will shift to the right. As shown below, the original demand curve ( $D_1$ ) has shifted to become a new demand curve ( $D_2$ ).

**Graph 2: A right shift of demand curve in the market of strawberry**



Changes in other demand shifters can have similar effects. The following will cause the demand curve to shift to the right (i.e. larger quantities will be demanded at each price).

1. an increase in perceived value of the good
2. an increase in consumer income  
Note: This is true only for *normal goods*. Increased income will lower the demand for *inferior goods*. Can you think of a product you would buy less of if your income rose significantly?
3. an increase in the price of a substitute good
4. a decrease in the price of a complementary good
5. an increase in the number of potential consumers in the market

Opposite changes in the above factors will cause the demand curve to shift down or to the left (i.e. less will be demanded at each price than before).

**Note:** Be careful not to confuse a movement along a demand curve from a shift to a new demand curve. It is a common mistake. Remember that the demand curve already shows the negative effect of price on quantity demanded. If the price of the good changes, we simply move to a new point along the existing demand curve. We call this a *change in quantity demanded*. If there is a change in a factor influencing demand, other than the price of the good, the entire demand curve moves or shifts. We term this a *change in demand*.

**Question 3: why is supply curve upward sloping?**

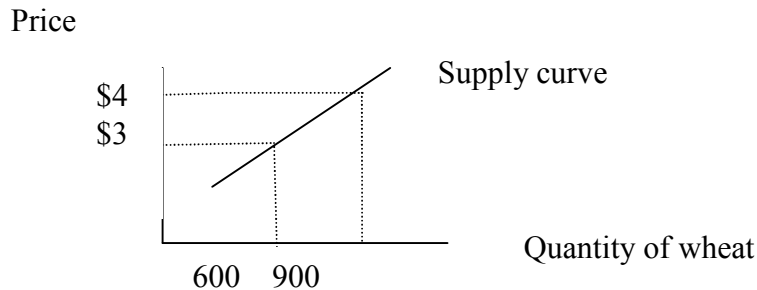
**Answer: Law of Supply**

**Explanation:** *Supply* indicates *willingness to sell*. Like demand, the supply of a product depends upon many different factors and one obvious factor is price. However, while high prices discourage buyers, they are likely to encourage sellers. Price has a positive effect on willingness to sell. All else equal (ceteris paribus), as the price of a product rises, the quantity firms are

willing to sell will rise as well. This is *Law of Supply*.

**Graphics:** A *supply curve* illustrates the relationship between the price of the good and the quantity that firms are willing to sell. For example, firms might be willing to sell 600 bushels of wheat at a price of \$3, but be willing to sell 900 bushels at a price of \$4. The relevant supply curve is drawn below. Because a change in price will push the quantity supplied in the same direction, supply curves will have a positive slope.

**Graph 3: The supply curve in the market of wheat**



**Question 4: What would shift the supply curve?**

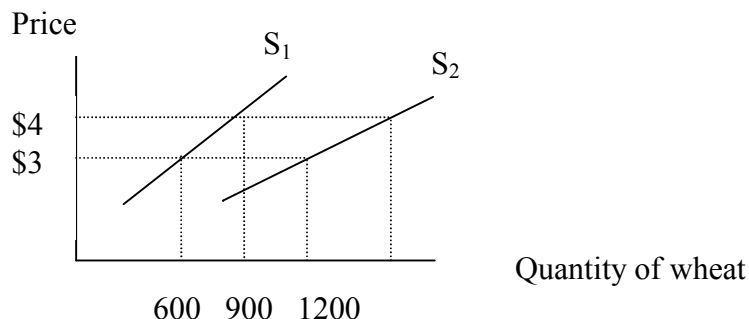
**Answer: All the possible supply shifters.**

Explanation: Price is not the only factor that impacts willingness to sell. Other important factors include:

1. Cost of inputs
2. Available technology
3. Profitability of other goods
4. Number of sellers in the market
5. Producer expectations

These factors are *supply shifters*. If any of them changes, the entire supply curve will move or *shift*. For example, suppose new technology lowers the cost of growing wheat. How will farmers react? The new technology increases the profitability, and therefore the willingness to sell *at every price*. Suppose the new technology doubles the quantities people are willing to sell at each price. In other words, firms are now willing to sell 1200 bushels (rather than 600) at the \$3 price and 1800 pounds (rather than 900) at the \$4 price. The supply curve shifts to the right. As shown below, the original supply curve ( $S_1$ ) has shifted to become a new supply curve ( $S_2$ ).

**Graph 4: A right shift of the supply curve in the market of wheat**



Changes in other supply shifters can have similar effects. The following will cause the supply

curve to shift to the right (i.e. larger quantities will be supplied at each price).

1. a decrease in the price of inputs
2. a increase in technological efficiency
3. a decrease in the profitability of producing other goods
4. an increase in the number of sellers in the market

Opposite changes in the above factors will cause the supply curve to shift to the left (i.e. less will be supplied at each price than before).

**Note:** As above, be careful not to confuse a movement along a curve and a shift to a new curve. Remember that the supply curve already shows the positive effect of price on quantity supplied. If the price of the good changes, we simply move to a new point along the existing supply curve. We call this a *change in quantity supplied*. If there is a change in a factor influencing supply, other than the price of the good, the entire supply curve moves or shifts. We term this a *change in supply*.

**Question 5: How is the price determined by demand and supply in a specific market?**

**Answer: Price is formed at the equilibrium (an imaginary stable point).**

**Explanation:** At last, we can return to the initial question: how does a market economy determine prices? The answer is that every market has a stable equilibrium where the quantities supplied and demanded are equal. Use your common sense. If you have supplied 100 pounds of strawberries, but consumers are willing to buy only 70, what will happen? How do real-world firms react when they are faced with products sitting on their shelves that no one wants to buy? They have a sale. They lower the price. After all, it's better to sell products at a reduced price than to not sell them at all. In other words, if the quantity supplied exceeds the quantity demanded (a *surplus*), prices will fall.

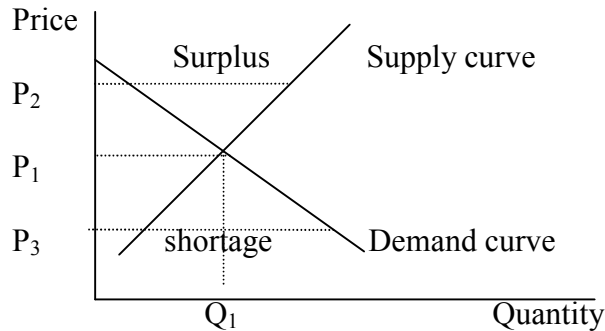
Change the example. This time, suppose consumers are clamoring to buy 100 pounds of strawberries, but you have only 70 to sell. Might you not raise the price? In fact, consumers will probably even offer a higher price. If you were one of the 100 potential customers, how could you make sure that the firm sold the scarce strawberries to you rather than someone else? Offer to pay a higher price! In other words, when the quantity demanded exceeds the quantity supplied (a *shortage*), prices will rise. Prices will be stable or in equilibrium only if the quantities supplied and demanded are equal.

Note that this process of price adjustment towards equilibrium level is thought to fail in the short run due to the *sticky price* assumption in Keynesian Economics

**Graphics:** No doubt you are eagerly awaiting a graphical illustration. Since both supply and demand curves are drawn with price on the vertical axis and quantity on the horizontal axis, we can put both curves on the same graph. Pretty exciting, right? The point at which the curves cross or intersect is the equilibrium.

In the example below,  $P_1$  is the equilibrium price and  $Q_1$  is the equilibrium quantity. Any price above  $P_1$  (such as  $P_2$ ) will create an *excess supply* or *surplus*. The quantity supplied will exceed the quantity demanded. In light of the surplus, firms will lower price to  $P_1$ . Any price below  $P_1$  (such as  $P_3$ ) will create an *excess demand* or *shortage*. The quantity demanded will exceed the quantity supplied. Because of the shortage, firms will soon discover that they can sell all they have even at a higher price. As a result, the price will rise to  $P_1$ . In the long run, the price always moves to the equilibrium.

### Graph 5: The Market clearance vs. Surplus vs. Shortage



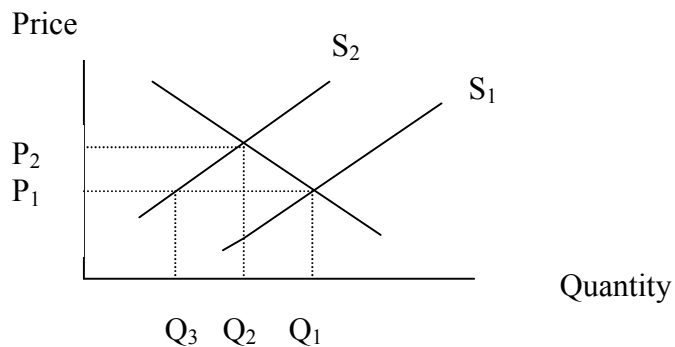
**Question 6: What would change the equilibrium in a market?**

**Answer: The shift of demand or supply curve.**

**Explanation:** If either the supply or demand curves shifts or moves, the equilibrium price and quantity will move as well.

As an example, suppose there is an increase in the costs of inputs needed to produce a good. This lowers the profitability of production and causes a decrease in supply (i.e. the supply curve shifts to the left showing that less will be supplied at each price).

### Graph 6: A change in equilibrium led by a left shift of supply curve



The initial equilibrium price is  $P_1$ , and the initial equilibrium quantity is  $Q_1$ . When the supply curve shifts left from  $S_1$  to  $S_2$ , consumers still want to buy  $Q_1$  but, given the new supply curve, firms are only interested in selling  $Q_3$ . The gap between  $Q_1$  and  $Q_3$  represents a temporary shortage of the good. The shortage causes the price to rise to the new equilibrium with price  $P_2$  and quantity  $Q_2$ .

To test yourself, try shifting a demand curve. Can you trace out what happens to equilibrium price and quantity? Can you explain the underlying economic logic?

### Part II Price Elasticity of Demand (PED)

**Question 7: What is price elasticity of demand (PED)?**

**Answer:** *PED* measures the *responsiveness of demand* for a product following *a change in its own price*.

**Explanation:** The formula for calculating the co-efficient of elasticity of demand is:

$$\frac{\% \text{ change in quantity demanded}}{\% \text{ change in price}}$$

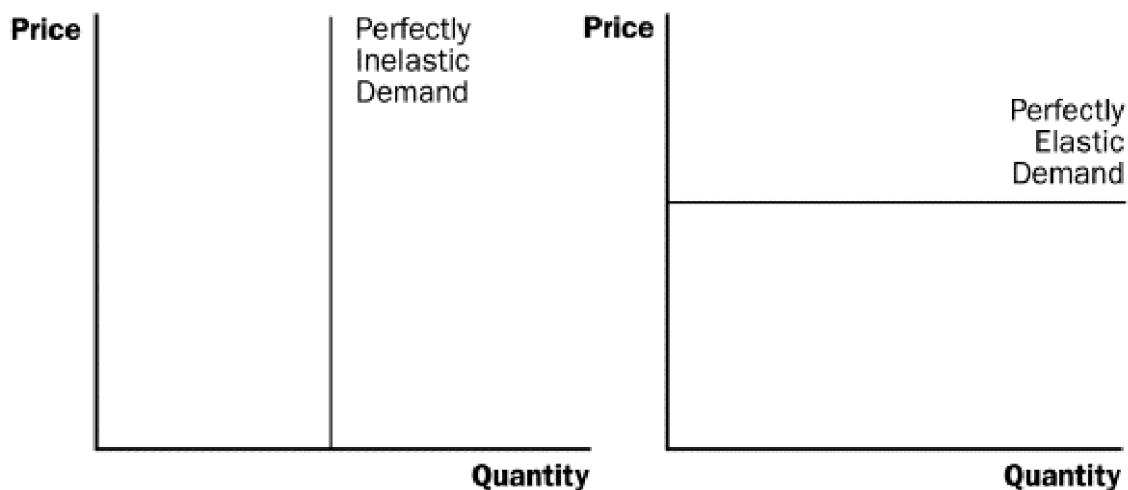
Since changes in price and quantity nearly always move in opposite directions, economists usually do not bother to put in the minus sign. We are concerned with the *absolute value* of price elasticity of demand.

**Question 8: How should different values for PED be interpreted?**

**Answer:**

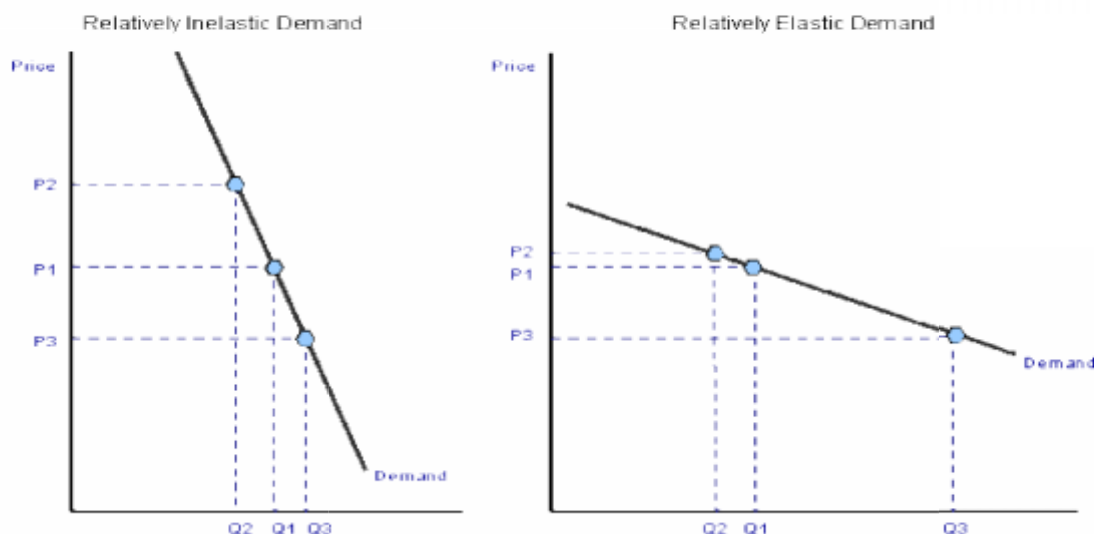
1. *If PED = 0* demand is said to be *perfectly inelastic*. This means that demand does not change at all when the price changes – the demand curve will be *vertical*. (Graph 7 Left)
2. *If PED is between 0 and 1* (i.e. the percentage change in demand is smaller than the percentage change in price), then *demand is inelastic*. Producers know that the change in demand will be proportionately smaller than the percentage change in price. The amount consumed does not vary very much with price.
3. *If PED = 1* (i.e. the percentage change in demand is exactly the same as the percentage change in price), then demand is said to *unit elastic*. A 15% rise in price would lead to a 15% contraction in demand leaving total spending by the same at each price level. A change in price will lead to the same change in the amount demanded.
4. *If PED > 1*, then demand responds more than proportionately to a change in price i.e. *demand is elastic*. For example a 20% increase in the price of a good might lead to a 30% drop in demand. The price elasticity of demand for this price change is  $-1.5$ . Even small changes in prices lead to big changes in demand.
5. *If PED = infinity* demand is said to be *perfectly inelastic*. This means that demand does not change at all when the price changes – the demand curve will be horizontal. (Graph 7 Right)

**Graph 7: Perfectly Inelastic Demand vs. Perfectly Elastic Demand**



## Graph 8 Relatively Elastic Demand vs. Relatively Inelastic Demand

Elasticity of demand measures the responsiveness of demand to changes in price  
Where the % change in demand is greater than % change in price – demand is elastic  
Where the % change in demand is less than % change in price – demand is inelastic



### An example: Demand for rail services

At peak times, the demand for rail transport becomes inelastic – and higher prices are charged by rail companies who can then achieve higher revenues and profits.

### Question 9: What Determines Price Elasticity of Demand?

Answer:

- 1. The number of close substitutes for a good / uniqueness of the product** – the more close substitutes in the market, the more elastic is the demand for a product because consumers can more easily switch their demand if the price of one product changes *relative* to others in the market. People ‘have’ to get to work, for example, a latter train is not a good substitute as you get there late, so the demand is inelastic. The huge range of package holiday tours and destinations make this a highly competitive market in terms of pricing – many holiday makers are price sensitive, so demand is elastic. You can always go somewhere else on holiday!
- 2. The cost of switching between different products** – there may be significant *transactions costs* involved in switching between different goods and services. In this case, you would need to buy a car for example, find a parking space near work and so on, therefore demand tends to be relatively inelastic.
- 3. The degree of necessity or whether the good is a luxury** – goods and services deemed by consumers to be necessities tend to have an inelastic demand whereas luxuries will tend to have a more elastic demand because consumers can make do without luxuries when their budgets are stretched. I.e. in an economic recession we can cut back on discretionary items of spending. Again, you ‘HAVE’ to get to work so ‘have’ to pay the higher price. Train companies know this and so put the price up without affecting the levels of demand.



**4. The % of a consumer's income allocated to spending on the good** – goods and services that take up a high proportion of a household's income will tend to have a more elastic demand than products where large price changes makes little or no difference to someone's ability to purchase the product. The evidence for this is largely anecdotal!

**5. The time period allowed following a price change** – demand tends to be more price elastic, the longer that we allow consumers to respond to a price change by varying their purchasing decisions. In the short run, the demand may be inelastic, because it takes time for consumers both to notice and then to respond to price fluctuations. Back to the train example, it takes time to buy a car and so on. They put their prices up and over time people would drift to cars away from trains.

**Whether the good is subject to habitual consumption** – when this occurs, the consumer becomes much less sensitive to the price of the good in question. Examples such as cigarettes and alcohol and other drugs come into this category. This is also why firms spend vast amounts on building brand images.

**Peak and off-peak demand** - demand tends to be price inelastic at peak times – a feature that suppliers can take advantage of when setting higher prices. Demand is more elastic at off-peak times, leading to lower prices for consumers. Consider for example the charges made by car rental firms during the course of a week, or the cheaper deals available at hotels at weekends and away from the high-season. Train fares are also higher on Fridays (a peak day for travelling between cities) and also at peak times during the day

**The breadth of definition of a good or service** – if a good is broadly defined, i.e. the demand for petrol or meat, demand is often fairly inelastic. But specific brands of petrol or beef are likely to be more elastic following a price change

### **An example: Wi-Fi prices and price elasticity of demand**

From airports to hotels to conference centers. From inter-city rail services to sports stadiums and libraries, more and more people are demanding wireless internet connections for personal and business use. But demand is being constrained by the limited availability of services and, in places, high user charges. However the price of connecting to the internet through Wi-Fi services is set to fall as competition in the sector heats up. Nearly 90 per cent of laptops now come with Wi-Fi connections as standard and many public areas are being equipped with hotspots, but users often complain about the high price of accessing the internet. At present airports and hotels can charge high prices because in many cases a Wi-Fi service provider has exclusivity on the area. However the supply of Wi-Fi services is more competitive on the high street and prices are falling rapidly as restaurants and coffee shops are using low-priced Wi-Fi access as a means of attracting customers. The more Wi-Fi providers there are in the market place, the higher is the price elasticity of demand for Wi-Fi connections.

Wireless usage is growing across the UK with sales of 3G cards growing by 475%; these are mostly through business channels. In the consumer market, sales of Wi-Fi routers for the home have grown by 77% many broadband providers are now providing free wireless routers with each new broadband subscription.

Note: Wi-Fi stands for Wireless Fidelity

Source: *The Cloud and GFK UK Technology Barometer, 2006*

### **Question 10: How do we apply these tools in macroeconomics?**

**Answer:** As you have learned in Chapter 1, Macroeconomics addresses a country's economy as a whole and doesn't look at an individual good or service market. So, you are going to see that a totally new tool so called *Keynesian Cross* (KS) developed by Keynesians would be employed to demonstrate how *aggregate expenditure* (demand) dictates equilibrium national income. It is also important to note that despite the fact that KS is a different tool, we can also view goods and services market as a whole from a supply-demand angle, i.e. we can think of Real Output (GDP) as the *Supply Side* and Aggregate Expenditure as the *Demand Side*. This helps us to understand



the equilibrium in a more intuitive way.

However, when we look at other three markets: Money Market, Labor Market and Foreign Exchange Market, we also have to turn to our classical demand-supply analysis mentioned above. The only difference is that the “product” we are dealing with now is no longer a real good or service such as strawberry or car maintenance, instead, we will look at investment (capital) in investment market and labor in labor market as the inputs to the production of the whole economy. In addition, we will also look at money in money market and currency in foreign exchange market. In the analysis, these things can all be taken as a special “product” simply because they all have their prices, demand and supply. In these markets, we also ask the same questions as we did in Econ 102 such as Why is demand (supply) downward (upward) sloping? What are the demand (supply) shifters? Is it possible for a specific demand (supply) curve to be perfectly inelastic (elastic)? How does the assumption on price elasticity of demand (supply) for a specific market affect our analysis and discussion on the macroeconomics policies?

It is also worth mentioning that you will find a downward sloping aggregate demand (AD) curve and an upward sloping short run aggregate supply (SRAS) curve in AS-AD diagram. We are going to follow the same routine as was done in micro demand-supply analysis. But keep in mind that AD (SRAS) curve is totally different from the demand curve for an individual good or service.

The following table summarizes the general information of these 4 markets.

**Table 1 Supply and Demand of 4 main markets in Macroeconomics**

<b>Market</b>	<b>Price</b>	<b>Supplier</b>	<b>Demander</b>	<b>Supply Curve</b>	<b>Demand Curve</b>
<b>Investment</b>	<b>Interest Rate</b>	<b>Households</b>	<b>Business</b>	<b>Absent in Keynesian View</b>	<b>Downward Sloping</b>
<b>Labor</b>	<b>Real Wage</b>	<b>Households</b>	<b>Business</b>	<b>Upward Sloping</b>	<b>Downward Sloping</b>
<b>Money</b>	<b>Interest Rate</b>	<b>Federal Reserve</b>	<b>Households and Business</b>	<b>Perfectly Inelastic</b>	<b>Downward Sloping</b>
<b>Foreign Exchange</b>	<b>Exchange Rate</b>	<b>Households and Business</b>	<b>Households and Business</b>	<b>Upward Sloping</b>	<b>Downward Sloping</b>

