Economic Environment and Business Strategy
Prof. Sukumar Vellakkal
Department of Economic Sciences
Indian Institute of Technology Kanpur
Week- 01
Lecture- 03

Understanding the Working of the Market Mechanism

Hello and welcome to this session. In the previous section, we discussed key concepts related to demand and supply. In this section, the primary objective is to utilize this framework to comprehend how prices are determined in a competitive market. Our focus will be on price determination, and subsequently, we will move on to the related concept of market power (elasticity), which will be covered in the next section. Regarding the first part—the determination of price—the process occurs through the market mechanism, namely, the free interaction of demand and supply. Markets, as I mentioned, rely on the forces of supply and demand.

A market is a platform where a group of buyers and sellers of a specific good or service meet, and it can be either virtual or physical. More importantly, it's a space where buyers and sellers interact. Our focus is on how this interaction occurs in a market. This helps in understanding how any event or policy might impact a market.

Through the free interaction of demand and supply, market equilibrium is established. Equilibrium, as you know, is the condition where quantity supplied equals quantity demanded. Here, equilibrium refers to quantity supplied equaling quantity demanded—not supply equaling demand. Always remember, we are focused on the quantity supplied and the quantity demanded. At equilibrium, there is no inherent tendency for the price to change; this is referred to as the equilibrium price.

At the equilibrium price, consumers are willing to buy the same amount that producers are willing to supply. I'm showing you the supply schedule, demand schedule, and equilibrium price for eggs. You can see the first column—that is the price schedule; the second one is the quantity demanded; and the third column is the quantity supplied. Therefore, you can see various price points and notice that at a price of 1.5, the quantity demanded is 77. So, that means at this equilibrium price, quantity demanded equals quantity supplied. That means equilibrium occurs where the quantity demanded equals the quantity supplied. There is neither excess demand nor excess supply.

When we plot this using a demand curve and a supply curve—this is the demand curve and this is the supply curve—doing so, we find the equilibrium point. The equilibrium price is 1.5, and the quantities demanded and supplied are 77.5; this can be noted here.

This means that at the point where the demand curve intersects the supply curve, the market is in equilibrium.

At market equilibrium, the quantity demanded equals the quantity supplied. In this example, the equilibrium price is where the demand and supply curves intersect. At all prices below the equilibrium price, excess demand occurs—we will discuss this in detail—and at prices above the equilibrium, excess supply exists. If you examine them individually, these are the demand equation and the supply equation. When we intersect these—when we set the quantity demanded equal to the quantity supplied—that's how we find the equilibrium price.

When you intersect both lines—that is, the quantity demanded. At equilibrium, you know that the quantity demanded equals the quantity supplied. Therefore, the quantity demanded here is 40 − 2p, which equals the supply; the supply is −20 + 2p. When you set these equal, you will find the equilibrium quantity because Q—the quantity demanded—is equal to the quantity supplied.

Then, when you set these equal, you will find the price. Here, what is the quantity—what is the quantity—you will obtain; from there, you can calculate the price. Simply put, what you see here is that the quantities demanded and supplied are given separately. When you set these equal, you find that p is equal to 15, and the equilibrium quantity (both demanded and supplied) is 10. So, from this demand curve and supply curve—or demand equation and supply equation—you can see that the quantity demanded and supplied are both 10 when the price is 15. This is the market equilibrium.

So, where the quantity demanded equals the quantity supplied—when the price is at 15—both are 10 units. You can find more examples using this slide, where you estimate the price, calculate it, and determine the quantity demanded and supplied. I have some additional worked-out examples here, with all the details. So, what are the equilibrium market price and quantity based on the demand and supply curve below? Just work through this one. As I mentioned, you simply set the quantity demanded equal to the quantity supplied—you need to make them equal.

Accordingly, you will find that for the first question, the quantity demanded is 20, and the price is $ 60; for the second question, the quantities demanded and supplied are both 30, and the price is $ 14; similarly, here, the quantity is 16, and the price is $ 100. As we have already shown, the demand curve, represented by a blue line, is followed by the supply curve, which is represented by a red line. You can see that this represents the equilibrium point. At equilibrium, the price is $ 2. When the price is $ 2, the quantity demanded equals the quantity supplied. So, then this is the equilibrium point—the equilibrium price is 2, and the quantity demanded and supplied is 14.

Then the question here is: what if the price is below the equilibrium price? Instead of the equilibrium price of 2, assume for a moment that the market price will be 1.75. Thus, using the supply and demand frameworks, we see that when the price drops, consumers will demand more. And similarly, what about the suppliers? When the price is lower, they will supply less. In this case, our equilibrium price, given the demand and supply conditions, is 2; the quantities demanded and supplied are 40.

However, due to some assumptions or external interventions, let's assume that the price is below the equilibrium price. When the price is $1.75, simply examine the corresponding quantities demanded and supplied. You know that when the price is low, the quantity demanded is going to be more, so the corresponding point is here, and you can see that when the price is $1.75, which is below the equilibrium price, the quantity demanded is going to be 50,000.

Therefore, the lower the price, the higher the quantity demanded. Then what about the supply? On the supply side, you can see that when the price is low, they are not willing to supply 50,000; they are willing to supply only 25,000. In this case, you can see that this much represents the excess demand. You can see that the quantity demanded exceeds the quantity supplied. So, how much is the shortage here? 25,000 is the shortage.

But then, will we reach a point where the price is $1.75? No. If there is no intervention, the free play of market forces will restore equilibrium at a price of $2, and the quantity demanded will be equal to 40,000. How? First, when the price is $1.75, you know that the quantity demanded is 50,000, but the market is supplying only 25,000.

Therefore, there is an incentive: consumers are now willing to pay more. The reason is that at 1.75, they require 50,000 units, but the market is only providing 25,000. So, they are gradually becoming willing to increase the price. They are willing to pay a little bit more.

That means when the price is increasing, as we have already studied, they will reduce the demand. Right. When the price is already low, they are willing to pay more; however, at the same time, an increase in price leads to a decline in the quantity demanded. Similarly, for supply, when there is a gradual increase in price, the suppliers are willing to supply more. Gradually, instead of 25,000, they are willing to supply 30,000, 35,000, 37,000, and so on.

Similarly, when the price rises, consumers are now willing to demand less. They initially demanded $50; then they reduced it to $49, $48, $45, and so on. Ultimately, because there is excess demand—meaning a shortage of supply in the market—there will be upward pressure on the price. When prices rise, we know that demand will decrease, and supply will increase. So, when prices rise, supply will increase to this level, and demand will decrease to this level.

This means that when the price continues to reach this level, we will eventually reach this point. So, this is the turning point, and eventually, equilibrium will be restored when there is excess demand. Similarly, what happens if the market price goes above the equilibrium price? For example, suppose the market price is 3. When the price is higher, it's clear that there will be an excess supply because suppliers are more satisfied with the higher price, as the equilibrium price is only $ 2, but the market price is $ 3. This means that at the higher price, they are willing to supply 65,000 units.

At the higher price, you know that consumers will only demand 25,000 units. Because the price is very high, suppliers are willing to supply 65,000 units, but there are fewer buyers since consumers only want to buy 25,000. This results in nearly 40,000 units of excess supply. Due to this, suppliers will lower the price—since they are willing to do so—and as the price drops, consumers are willing to buy more gradually. Ultimately, the process looks like this: when the price decreases, upward pressure on demand occurs, and suppliers' willingness to supply also decreases from 65,000; this movement continues in that direction.

And when the price increases, consumers are willing to buy more now. So, they will start moving in this direction—the movement will look like this—and eventually, the equilibrium price will be restored, along with the equilibrium quantity demanded and supplied. In this case, if the market price is above the equilibrium price, there will be downward pressure on price; as a result, the quantity demanded will equal the quantity supplied. We have already discussed what the equilibrium price is. This is a summary of price equilibrium.

That means that at prices above the equilibrium, there is an excess supply and downward pressure on the price, and at prices below the equilibrium, there is an excess demand and upward pressure on the price. So, consumers are incentivized to offer higher prices in such situations. Regarding the price mechanism— is it a policy tool? How does it support the business environment and inform policy decisions? Policymakers often aim to reduce cigarette consumption. For example, if they want to decrease cigarette use, the price mechanism offers a useful approach because one method is to increase the price of cigarettes.

When the price of cigarettes increases—as we have already discussed in this lecture—that means when there is a price increase, the demand for that product will decrease. So, the government knows this, and because they understand that there is a demand system—when the price goes up, people will demand less of this product—in order to raise the price, the government will tax the manufacture of cigarettes. When cigarette companies pass much of this tax onto consumers as higher prices, the increased prices encourage smokers to reduce the number of cigarettes they smoke. This is one policy tool.

This is just an example. It demonstrates how the price tool is utilized by the government and other stakeholders to achieve specific objectives. The effectiveness of this approach in practice also depends on demand elasticity, which we will cover in a future session. For now, the main point is that price is one of the tools the government recognizes. To raise the price, their basic idea is that higher prices lead to lower demand. So, they try to raise prices by increasing taxes.

This means that, in theory, a higher price will eventually cause a decrease in the quantity demanded. However, we cannot blindly apply this policy because there may be unintended consequences; that is why further research is necessary. For example, if cigarette prices or taxes increase—say, by 100%—people might turn to substitutes like alcohol.

This needs to be considered. When raising taxes on cigarettes, policymakers should also think about taxes on alcohol; otherwise, people might switch to drinking more alcohol. Another way to lower smoking is to shift the demand curve for cigarettes by requiring health warnings. You know the demand curve will move left or right. If it moves left, that shows changes in tastes and preferences. It can move left if there is a mandatory health warning, and the pictorial warning on cigarette packets will make consumers more aware—educate them—and increase their understanding that smoking harms health.

As a result, using that tool, the demand curve can shift to the left. At that point, they cause the demand curve to shift to the left, but in doing so, they cause consumers to move along the new demand curve. Right. That is the slight difference here. Using demand and supply analysis helps us predict market movements—the changes in quantity demanded and quantity supplied.

When the demand and supply curves shift, the equilibrium price and quantity change. How? To understand this, we can employ a simple method known as comparative statics. In comparative statics, you start from a point of equilibrium and then introduce the changes to be analyzed. These changes may include a price increase, a supply shock, or a demand shock.

Afterward, the new equilibrium position is identified. Then, compare this new equilibrium with the previous one. From this comparison, we can observe the impact of the intervention or shock—whether supply-side or demand-side—on both price and the quantities demanded and supplied. For example, consider shifts in supply. Imagine an increase in supply shifting the supply curve to S1—this is case one.

There is an increase in supply. An increase in supply raises the equilibrium quantity but lowers the price. How? You can see that at the given price, the supply curve shifts upward. And since there is a greater supply, it means sellers are willing to supply this

much. Because of the increased supply, they are willing to supply a larger quantity. You also know that at this price, consumers are willing to demand only this much, not more.

Right. They are willing to demand only this much when the price is P0. The supply curve shifted—perhaps due to a decline in production costs or technological advancements—enabling them to produce more. Think about computers, smartphones, and tablets—electronic gadgets where the cost of production has decreased. At the same price, they are willing to supply this much more.

But there is no change on the demand side. As a result, they are willing to demand only this much. Then, the firms will be willing to reduce their prices, leading to a decline in prices. When the price declines, the quantity demanded increases—quantity demanded increases. Now this is the new equilibrium point. The demand curve remains the same—the old demand curve hasn't changed—and it intersects with the new supply curve.

This is the new equilibrium price. From this, you can see that the quantity demanded increases from Q0 to Q1, and the price drops from P0 to P1. As a result, if there is an increase in supply—perhaps due to a decline in production costs—they are willing to supply more. The likely market implication—assuming demand remains unchanged—is that prices will fall, and the equilibrium quantity will rise. Essentially, the price will decrease, and the quantity demanded will increase.

They move along the same demand curve. Similarly, consider a real example from 1998 in South America—the crisis that occurred during the 1990s. In the coffee market, frost was harmful to coffee production. Before the frost, the coffee market was in equilibrium at a price of 1.2. This is the equilibrium price, and the equilibrium quantity demanded and supplied are 13.

That's the initial equilibrium position. After the frost, you know that because of the frost, there is a decline in production, and as a result, supply has decreased. So, at this price, they are now willing to supply only this much because production has declined. What happens now is that, at this price, they are willing to demand this much but are only willing to supply this much. Then, there will be upward pressure on the price. Finally, the new equilibrium position will be where the new supply curve intersects with the demand curve; the market equilibrium is at 9—that is, the quantity demanded and supplied—and the price is 2.4. This is how a market shock, specifically a supply-side shock, changes market dynamics. From this real example, you can see that the quantity demanded and the quantity supplied declined to 9 from 13.2, and the equilibrium price increased to 2.4 instead of 1.2. What about the shift in demand? What we have discussed so far is about the shift on the supply side. If there is a shift in demand, it indicates an increase in demand. An increase in demand shifts the demand curve to the right from D0 to D1—this

is the new demand curve. The initial equilibrium position is here, and because there is an increase in demand, the curve shifts to the right to this point.

The new equilibrium position is here, where the quantity demanded and supplied is Q1 and the price is P1. That means when supply conditions stay constant—on the supply side nothing changes—if there is a sudden increase in demand, such as during the COVID period, there is a sharp rise in demand for face masks and many related products like life protectors and other protective gear. As a result, you can see the demand curve shifts rightward. Then the price will increase, and both quantity demanded and quantity supplied will also rise.

Here, you can clearly apply the supply and demand framework. Even though the change involves only demand conditions—specifically, an increase in demand—the demand curve shifts. As a result, the quantity demanded, quantity supplied, and price all change under these circumstances. If you plot these changes, what happens if there is a proportional increase in both demand and supply? Imagine the demand curve shifts to the right, and the supply curve shifts to the right similarly. In this case, if both shifts are equal, there will be no change in price, but the quantity demanded and supplied will increase. Let's consider a real-world example and analyze it using the demand and supply framework.

Using this example, you can understand many real-world scenarios that are very important for grasping the economic and business environment. For instance, if there is a change in tariffs, taxes, or an increase in the money supply, how will these affect price, demand, and supply? Through demand and supply analysis, let's take a simple example to illustrate how we can interpret real-world situations. I’m providing two familiar products: the prices of eggs and college education. From 1970 to 2007, the real price of eggs decreased by 49 percent, while the real price of college education increased by 105 percent. Now, let’s examine how the demand and supply for college education and eggs changed during this period.

First, consider the supply and demand for eggs. On the supply side, the mechanization of poultry farms significantly lowered the cost of egg production over time. Consequently, the supply curve shifted to the right. On the demand side, there was a decline in overall demand for eggs—not just a decrease in the quantity demanded at a specific price, but a broader reduction. This indicates that, over time, the demand curve for eggs shifted to the left as a more health-conscious population tended to avoid eggs.

Now, regarding the supply and demand for college education: over time, at a given price, the supply of education has decreased. In the case of college education, rising costs of equipping and maintaining modern classrooms, laboratories, and libraries, along with increasing faculty salaries, have shifted the supply curve upward—to the left. During this

period, demand for education increased. The demand curve moved to the right as a larger percentage of the growing number of high school graduates decided that a college education was essential. So, what I am discussing here is the supply and demand, mainly at a fixed price: for eggs, the supply increased.

The demand for eggs declined, but for college education, at a given price, the supply of education decreased while the demand for college education increased, even at the same price. Importantly, you need to remember that, in absolute terms, the demand and supply of both eggs and education still grew over time.

So, when you plot this... Let's first look at the market for eggs. The initial equilibrium is at a price of 0.61. With mechanization in poultry farms, the supply curve shifts to the right; farmers are willing to supply more. Due to an excess supply, sellers are willing to lower their prices, and prices drop to this point. And what about the demand curve? Due to increasing health consciousness, consumers are willing to demand less at this price.

They are willing to demand less, but since the price has already fallen, they will adopt this new stance. At the same time, the demand curve shifts leftward to this point. The curve shifts here, and now this is the new equilibrium. At this point—the intersection of the new supply and demand curves—you can see that the quantity demanded and supplied has increased to 7,400, and the price has decreased.

This is about the relationship between supply and demand in the egg market. Notably, the growth rate of supply exceeded the growth rate of demand. As a result, a larger quantity of eggs is both demanded and supplied, but at a much lower price. So, what about college education? In the case of college education, this refers to the initial demand and supply.

The price was $2,530. The quantities demanded and supplied were 6.9. Due to the reasons that we mentioned—such as the rising cost of production in education—the supply curve shifted to the left. At this price, suppliers are now willing to supply less. As a result, upward pressure is placed on prices. Meanwhile, as people have become more aware of the importance of education, they are willing to invest more and pay higher prices.

As a result, at the same price, they are willing to support a higher demand for education. Demand increases. Then you can see that this represents the new supply curve, the new demand curve, and the new quantity demanded and supplied. What you can see is that the quantity demanded and supplied of college education has grown, but at a higher price. You can see that prices have more than doubled during this period.

But at the same time, you can clearly see the change in both price and quantity. In the egg market, the quantity demanded and supplied increased, but prices dropped because the cost of production had declined. Here, the quantities demanded and supplied also

increased, but prices doubled. Prices became more than twice as high because the cost of producing education had increased. However, the demand for a college education outweighed the declining supply. That's why, at a higher price, there is always an incentive for educational institutions to provide more educational outputs.

That is an illustrative example. Similarly, I am providing another illustrative example. The effects of the 9/11 terror attack on the supply and demand for office space in New York City are significant. This represents the initial equilibrium position. When a terrorist attack occurs, the supply of office space decreases, causing the supply curve to shift to the left. As a result, the price is expected to rise.

At the same time, the quantity demanded will also decrease. Here, you can see that the supply curve has shifted, and similarly, the demand curve has shifted as well. This leads to a new equilibrium price and quantity. What we've discussed so far is the use of demand and supply analysis. We are saying that when the price increases, the quantity demanded decreases.

And when the price is higher, firms are more willing to supply. However, the way we discussed this is akin to an auction market. The real world isn't exactly like that—the markets you see aren't truly like that. However, behind the scenes, demand and supply are always at work. When you visit a nearby grocery store, for example, you can see that the prices are already set.

The price is already written or fixed—this is called an administered price. Prices are administered mainly to prevent chaos at the counter. Based on demand and supply, sellers already know the appropriate price. Right, but auctions—the kind we've discussed so far—mainly occur in cases like stock prices, stock exchanges, or foreign exchange rates. Fixed or administered prices, such as those for cinema tickets or supermarket goods, are based on administrative pricing. But even though these prices are written or fixed, they still reflect the underlying forces of demand and supply.

Similarly, in markets like the car market, prices are often mixed. They may have a fixed listed price, but if you negotiate, you may be able to get a discount. This means some level of demand and supply interaction still occurs. So far, we have explained how demand and supply interact and how prices are set. Using the demand and supply framework, we aim to understand real-world scenarios and how they influence the quantities demanded, supplied, and prices. In the next session, we will discuss further how the demand and supply framework is important for understanding market behavior.

We will introduce the concept of elasticity—the magnitude of changes in quantity demanded and quantity supplied—and explore it in detail in the next class. Thank you.