**Elasticity of Demand**

Today, we begin to discuss **elasticity** and its applications. This is going to take us a few lectures because the **material** is a little bit **involved** and also, I'm going to be **honest**, the **material** can be a little bit **tedious**. There are some **formulas** that we're going to have to learn how to use and memorize and so forth. However, the applications are really **fascinating**. **Moreover**, elasticity is going to **come back again and again.** We're going to use it when we do taxes and subsidies, we're going to use it again when we do **monopoly**. This is just another one of those **foundational** concepts that is going to pay to learn well the first time we do it. Let's get started.

Demand curves slope down. **In other words**, when the price goes up the quantity demanded goes down, when the price goes down the quantity demanded goes up**. Pretty simple**. But how much does quantity demanded change when the price changes? When the price goes down, does the quantity demanded increase by a lot or by a little? That's the concept that elasticity is going to help us to understand.

 Here's the basic terminology. **A demand curve is said to be elastic when an increase in price reduces the quantity demanded by a lot.** And similarly, **when a decrease in price increases the quantity demanded by a lot.** **That's an elastic curve. *The quantity is changing a lot in response to the price.*** **When the same increase in price reduces the quantity demanded just a little or when the same decrease in price increases the quantity demanded just a little, then the demand curve is said to be inelastic or less elastic or not elastic.**

**The elasticity of demand is going to be a measure of how responsive the quantity demanded is to a change in the price.** Here's an example. Let's start with this demand curve which we're going to see, is an inelastic demand curve. Notice that when the price increases from $40 to $50 that the quantity demanded goes down by just a little, by five units from 80 units to 75 units. Now consider the following, suppose we had a demand curve like this. This **turns out** to be an elastic demand curve. Notice that the same $10 increase in price now reduces the quantity demanded from 80 units to 20 units.

**On the elastic demand curve, the quantity demanded is much more responsive to the price than it is on the inelastic demand curve.** On a demand curve where the quantity demanded is **responsive** to the price, that's called an elastic demand. On a demand curve when the quantity demanded isn't responsive or is less responsive to the price, that's an inelastic demand or a more inelastic demand, a less elastic demand.

Now you may have noticed on the previous **diagrams** that the inelastic curve had the higher slope. That is it was more vertical while the elastic curve was the more horizontal curve. We haven't defined elasticity technically yet. When we do so, you'll be able to see that **elasticity** is not the **same as slope.** However, they are related. For the purposes of this class, if you follow a simple rule you're going to be fine. **The rule is this, if two linear demand or supply curves run through a common point, then at any given quantity the curve that is *flatter*, more *horizontal*, that's the more elastic curve.**

So if you're going to draw two demand curves which we're going to have to do many times in this class. Let's say they run through a common point. **The flatter one is the more elastic curve**, that will work fine for you. What determines whether a demand curve is more or less elastic? The key determinant is the availability of substitutes. As we'll see in a minute, the more substitutes the more elastic the curve.

We can also give some more **specific** examples that are closely related to the number of substitutes. The time horizon, a longer time horizon is going to make the curve more elastic. The category of product, a broad category is going to be less elastic. A specific category, more elastic. **Necessities** **versus luxuries**. Luxuries are going to be more elastic. The purchase size, bigger purchase sizes are going to be more elastic. Now I've gone through those quickly so don't worry if you haven't followed them all right away. I'm going to go through them now each in turn and explain the details.

The availability of substitutes is really the key determinant of how elastic a demand curve is. The idea is pretty intuitive. If there's lots of substitutes for a good then when the price of that good goes up, people are going to switch from it, the good it's price is increased towards the substitutes. They're going to buy the substitutes instead. That means that when a good with lots of substitutes, when the price of that good goes up, the quantity demanded is going to go down a lot as people switch to the substitutes. On the other hand, **if we have a good which has very few substitutes then consumers are going to find it harder to adjust when the price has changed. In particular, if the price goes up and there are very few substitutes, consumers aren't going to be able to switch out of that good into another good.** So the quantity demanded is going to remain **fairly** constant. It's not going to fall a lot when the good has few substitutes.

Let's test your understanding with some quick examples. Oil, Brazilian coffee, **insulin**, Bayer Aspirin. Which of these goods have an elastic demand? Which of them have an inelastic demand? Let's start with oil. Are there lots of substitutes for oil or just a few substitutes? Just a few substitutes, right? So if the price of oil goes up tomorrow, at that point do we all stop driving our cars? No, there aren't very many substitutes at least in the short run. Few substitutes that means inelastic demand for oil.

What about Brazilian coffee? Some people love Brazilian coffee but there's also Ethiopian coffee, there's Mexican coffee, there's Guatemalan coffee. Therefore, **lots of substitutes, therefore elastic demand.** Insulin, if you don't get it you're going to die. **Not many substitutes, therefore inelastic demand.** What about Bayer Aspirin? If you go to Wal-Mart you'll find Wal-Mart Aspirin. If you go to **Target** there's Target Aspirin. All kinds of **generic** aspirins. If you understand that aspirin is aspirin, you'll understand that there are lots of substitutes. If Bayer tries to raise the price of its aspirin too much you'll say, "Forget it. I'm going to go buy the substitutes." therefore, elastic demand.

The time horizon influences the elasticity of demand for a good. And really this is just an application of the fact that the **fundamental** determinant is substitutes. **Immediately** following a price increase it's going to be difficult to find substitutes. Therefore, immediately following a price increase, demand is likely to be fairly inelastic, but **over time** consumers can adjust their behavior and they can find more substitutes. For example, if the price of oil goes up then we know that there are very few substitutes in the short run.

But in the long run what are some of the things that people would do if the price of oil stays **permanently** higher? We'll drive smaller cars. They'll switch to **mopeds**. There's a lot more mopeds driven in Europe for example because for decades the price of oil has been higher in Europe due to taxes. People have adjusted. In the long run, people will even adjust how cities are designed so that more people will live in apartments closer to where they work if the price of oil stays high. If the price of oil is really low, there'll be more **sprawl**. People will be more willing to live far away and have a big **lawn** if the price of oil isn't so high. **The longer the time horizon, the more the ability to adjust.** The more substitutes and thus the more elastic the demand.

Another factor determining the elasticity of demand again based upon the **fundamental question**, are there lots of substitutes or just a few is what we might call the classification of the good. The broader the classification, the less likely consumers will be able to find a substitute. The narrower the **classification**, the more likely consumers will be able to find a substitute. We've already seen an example of this. There are more substitutes for Bayer Aspirin, a narrow classification, than there are for aspirin, a wider classification. If the price of Bayer Aspirin goes up, there are more substitutes, the **generics**. If the price of all aspirin goes up there are fewer substitutes. Of course there are still some like **ibuprofen** and **acetaminophen** and so forth. **But the narrower the classification, the more substitutes, the more elastic the demand.**

Another example, the demand for food. A broad classification is less elastic than the demand for **lettuce**, a particular type of food, a narrow classification. Therefore the demand for **lettuce** would be more elastic than the demand for food. The nature of the good in the consumer's mind can also affect the elasticity. In particular whether the good is thought of as a **necessity or as a luxury**. Now don't take these **categories** as **somehow** being out there in the world. They are more about a person's tastes.

For example, for some consumers that coffee in the morning is a necessity. Even if the price of coffee goes up by a lot, those consumers will still continue to consume about the same amount of coffee. Therefore those consumers will have an inelastic demand. They'll have an inelastic demand for goods that they consider to be necessities. The same good in someone else's mind might be a luxury. The consumer who **occasionally** has a cup of coffee. If the price goes up then they're going to be more willing to say, "Nah, I'm going to switch to tea. I'm going to switch to something else."

Depending upon how consumers **regard** the good therefore as a necessity, more inelastic demand. As a luxury, more elastic demand. The final determinant is the size of the purchase relative to a consumer's budget. If the purchase is small relative to the budget, then consumers may not even notice when the price goes up. And if they don't notice they're not going to respond with a big change in the quantity demanded. On the other hand, if we have a product which is a large part of the **budget**, consumers will notice.

Consumers notice when the price of automobiles goes up, that's a big purchase. They're going to shop around a lot. They're going to try and get a big **bargain** when the purchase is a large fraction of their budget. On the other hand, when the price of **toothpicks** goes up by a lot, that's not such a big deal. Consumers probably won't even notice whether toothpicks are $0.50 or a $1. That's a 50% increase in price, but you probably don't even notice that at the store. So small item at least in the short run more inelastic. Bigger items, the bigger part of the budget, ones the consumer notices, more elastic, more price sensitive.

 Let's summarize the determinants of the elasticity of demand. **For less elastic goods, that means fewer substitutes.** ***Short run, less time to adjust, necessities, small part of the budget. Each of these factors makes the demand curve less elastic.*** **More elastic demand, that means more substitutes. Long run, more time to adjust. Luxuries, large part of the budget. These factors make a demand curve more elastic.** If you have to memorize these but once you understand that elasticity **means how responsive is the quantity demanded to a change in the price**, then you'll be able to **recreate** or **figure out** these factors again. That's it for the elasticity of demand.

Next time, we're going to take a closer look at technically how do we get a number? How do we calculate the elasticity of demand? Given some facts and figures on prices and quantity demanded, how do we calculate with the elasticity really is? What's the number? - If you want to test yourself, click Practice questions. Or if you're ready to move on, just click Next Video.