

Determinants of Elasticity of Demand and Supply, and the 2nd Laws of Demand and Supply

Demand

1. Availability of substitutes for consumption

The better the substitutes, the more elastic the demand (higher $|E_D|$).

If there is a price increase for a good, and that good has a number of good substitutes, we would expect many consumers to switch to substitutes, resulting in a large change in the quantity demanded of the good. Thus, more substitutes lead to a more elastic demand curve.

There are lots of substitutes for Peppino's pizza – Columbo's Little Caesars, hamburgers, chicken

There are fewer substitutes for pizza in general – hamburgers, chicken

There are few substitutes for food in general

Thus Peppino's will have the most elastic demand curve, with food having the least elastic demand curve (most inelastic demand curve).

$$|E_{\text{Peppino's pizza}}| > |E_{\text{Pizza}}| > |E_{\text{food}}|$$
$$E_{\text{Peppino's pizza}} = -8, E_{\text{Pizza}} = -1.4, E_{\text{food}} = -0.4$$

2. Fraction of the budget

If a good is a large component of the budget, the good will have a more elastic demand curve (higher $|E_D|$).

$$|E_{\text{CAR}}| > |E_{\text{SALT}}|$$

Salt is such a small portion of your budget that you aren't responsive to a 10% increase in the price of salt (\$0.05?) where as a 10% increase in the price of a car (\$2500?) is a bigger deal.

3. Time (2nd Law of Demand)

2nd Law of Demand - The longer a price change persists, the greater the change in quantity demanded. Or Demand curves are more elastic (higher $|E_D|$) in the long run than in the short run. (Notice I don't claim that long run demand curves are elastic, but that they are more elastic than short run demand curves.)

Why?

It is costly to learn of price changes and it is costly to change your behavior. Both costs are lower if they are slower. Imagine Arby's e-mails you a message announcing a sale that begins at 1:20, and only lasts 5 minutes. Perhaps you didn't check your e-mail today (you didn't learn of the price change). Perhaps you've already eaten a big lunch, or left your wallet at home, or don't want to run out of class in the middle (costly to change your behavior). But if Arby's sends you another e-mail, this time announcing a sale at the same time next month, you will have time to learn of the price change, and have time to change your behavior. You are much more likely to have a larger change in quantity demanded in response to the sale. This is the idea.

Supply

1. Stuff we'll ignore.

2. Time (2nd Law of Supply)

2nd Law of Supply – The longer a price change persists, the greater the change in quantity supplied. Or Supply is more elastic (higher E_s) in the long run than in the short run.

Imagine a factory trying to respond to a doubling in prices. In the short run, the capacity of its plant is fixed (capital is fixed). They can increase production, but eventually they are limited by the size of the plant. In the long run, however, they have had more time to adjust and can increase the capacity of the plant. That is, as time goes on, they are able to adjust more and respond with a greater increase in the quantity supplied.

Aside - how long is the long run?

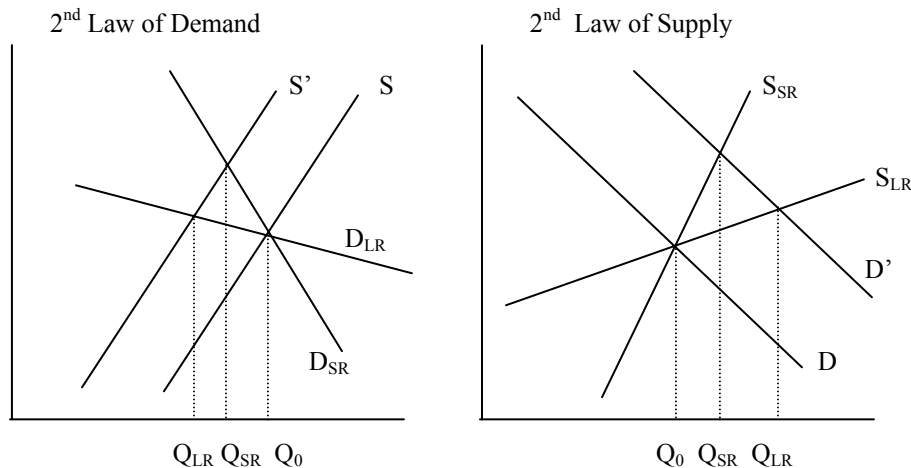
We refer to the short run as the period of incomplete adjustment, and the long run as the period of complete adjustment. How long is the long run? I don't know. It depends. In some cases it might be 3 weeks, sometimes 4 years? Think of a big nuclear power plant. How long does it take to build one? How long would it take for carmakers in Detroit to respond to an increase in the price of gas? I imagine a quicker response, say, for an increase in the price of pizza? .

How about some pictures?

Let's look at how a supply decrease affects the market for gasoline. We start in initial equilibrium. Also, we draw two demand curves, a long-run demand curve and a short-run demand curve. The short-run demand curve will show us the "short-run" response to the price change, while the "long-run" demand curve will show us the "long-run" response. The long-run curve is more elastic than the short run curve, in accordance with the 2nd Law of Demand. Think back to the Oil Crisis of the early 1970s. A large reduction in the supply of gas caused the price in the US to rise. The initial response was to cut back consumption of gas (From Q_0 to Q_{SR}). Drive less, vacation closer to home, walk to work, etc. However, we were all driving gas guzzling giant cars. As the price change (supply shift) persisted, people began to make adjustments that resulted in an even larger reduction in quantity of gasoline demanded. We bought more fuel-efficient cars, smaller cars, Japanese cars, moved closer to work, etc. This resulted in a further cut back.

When I refer to the short run response to the change in supply I mean from Q_0 to Q_{SR} .
 When I refer to the long run response to the change in supply, I mean from Q_0 to Q_{LR} .
 We'll refer to the movement from Q_{SR} to Q_{LR} as the adjustment period.

As you can see, the long run response was larger in magnitude than the short run. People continued to reduce the quantity demanded as we go from the short run to the long run equilibrium.



lecture9

Above on the right is the picture depicting the 2nd Law of Supply. Here, an increase in the demand for a good has induced suppliers to produce more of the good. Think of a sequin glove factory. They are cruising along, producing Q_0 , when all of the sudden, Michael Jackson comes out and produces Thriller, an instant increase in demand. In the short run, this increases production from Q_0 to Q_{SR} . Workers work overtime, that old sewing machine is dusted off, maybe a few workers are hired. However, things get crowded at the plant. There are not enough sewing machines to increase production further. However, as the demand curve increase persists, they increase plant capacity, buy some more sewing machines, hire more workers, and they are able to increase production even further to Q_{LR} .

Again, the salient feature is that the long run response to (Q_0 to Q_{LR}) is larger in magnitude than the short run response (Q_0 to Q_{SR}). Suppliers continue to increase their quantity supplied as we go from the short run equilibrium to the long run equilibrium.

You may have noticed I didn't even label the prices on these graphs. I want you to focus on the quantity response for a given change. You can certainly draw in the prices if you wish.

Can you draw these pictures for a decrease in supply (2nd Law of Demand) and for an increase in demand (2nd Law of Supply)?