



# Chapter Three:

# **Demand**



# Demand in Proverbs

## **Proverbs 16:26**

*A worker's appetite works for him,  
For his hunger urges him on.*

## **Proverbs 25:16**

*Have you found honey? Eat only what you need,  
That you not have it in excess and vomit it.*

## **Proverbs 27:7**

*A sated man loathes honey,  
But to a famished man any bitter thing is sweet.*

We all have needs, and basic among them is the requirement for food for sustenance. We see in Proverbs that hunger is a driving force; it causes us to act and to overcome our fleshly sloth. Hunger can move us in a powerful way, but once we get our fill, it no longer urges us on. As economics teaches us, there is diminishing marginal utility as we consume more and more of a given good. Solomon highlighted the upper limit: ultimately, if you eat to excess, you may vomit what is not needed. Even if your mind says *I want it*, your body knows additional honey offers negative marginal utility!



## Desired Learning Objectives

*At the conclusion of this chapter, the student should understand and be able to apply (as appropriate) the following concepts:*

- Why the concept of consumer demand is inextricably linked to opportunity cost
- Why relative prices drive individual choice
- Law of Demand: As price of a good goes down, its quantity demanded will increase
- Why a change in demand is very different from a change in quantity demanded
- What factors cause a change in demand
- Why changes on the *margin* are important in economics
- How to derive a market demand curve from individual demand curves
- Why consumer surplus illustrates the consumer's gain from trade
- How demand for a good is reflected in its elasticity

# Introduction

One fond memory I have of when my children were young is hearing one of them say, “I want what I want!” Most of us feel that way, but the candor of a 3-year-old makes our natural, fleshly self-focus very clear. Sometimes we call them “wants,” and other times we call them “needs.” Usually the things we consider to be “needs” are the things that *we* desire; while the things that *others* desire we consider to be only “wants” and not nearly as important to satisfy! Economics, however, doesn’t consider the distinction between “wants” and “needs” to be particularly relevant. Even our “needs” have substitutes, so we almost always have a choice. For the very few things that might not have substitutes (such as the air we breathe), there is no choice, and thus no economic calculation.

**Supply and demand analysis:** (definition of this new term will go here)

Evaluating our wants or needs requires a new tool in our tool kit: **supply and demand analysis**. You’ve probably heard, at one time or another, the phrase: “it’s just supply and demand.” This could have been referring to an explanation of some price or economic situation, and from the simple meaning of those words you probably have come to a rudimentary understanding of the phrase. You might think, “if there is more of something, it costs less”—and vice versa. Obviously, we will need to go *much* more in depth, but the good news is our basic supply and demand analysis is relatively simple; yet, it is a very powerful tool to explain much of what we see around us. We will first consider *demand* and then we’ll review *supply* in the next chapter.

## Concepts for Demand: A Quick Summary

**Scarcity:** (definition of this new term will go here)

We’ve already discussed **Acting Man** and how he continually assesses his situation, makes causal reasoning between means and ends, imagines satisfaction from action, and makes plans to act. **Scarcity** is the driving force for action since there is not enough to meet all his demand for goods that are freely available from nature. He must choose between various alternative means to satisfy his desires.

“Our choices are always on the margin”

The very act of choice suggests an *opportunity cost*: choosing one thing *must* entail the setting aside of another possible action towards the next preferred alternative. Our choices are always on the margin; we consider the additional benefits of a choice against the additional costs. For instance, we never consider choosing between jeans and tennis

shoes in an abstract sense. We compare the benefits of a particular pair of jeans against the benefits of a particular pair of tennis shoes (which we’ll have to forgo to purchase the jeans), and our choice will be guided by how much of each we already possess. In economic language, we consider the **marginal utility** of each alternative in making our choice between two goods.

**Marginal utility:** (definition of this new term will go here)

We face true uncertainty, so all action is essentially speculative and can be thought of as entrepreneurial. We don’t know the future, but *ex ante* (before the action) we imagine our actions will lead to a better state of affairs than any other alternative. We may be right in the end, or may be disappointed *ex post* (after the

**ex ante:** (definition of this new term will go here)

**ex post:** (definition of this new term will go here)

fact). The results, good or bad, will ultimately shape our expectations of future actions. Expectations, as we will see, are a crucial factor in the concept of **demand**.

## A Deeper Dive into Concepts for Demand

**ceteris paribus:**  
all else equal

Let's take a look at a question regarding demand in order to get a little more prepared for this chapter. Say that your favorite brand of t-shirts is currently on sale for 50% off. What will happen to your demand for this t-shirt? If the price goes down then the demand goes up...doesn't it? Maybe...maybe not. I will highlight the imprecision of saying "demand" later on in this chapter and explain why we should use the term "quantity demanded," but aside from that, we still can't really make a decision about demand from just a price change. In chapter one I highlighted the critical assumption of *ceteris paribus*, or *all else equal*. If this assumption doesn't hold then we can't say much about what will happen when one variable changes, since other variables could change as well. Say the

assumption doesn't hold and in fact all prices have fallen by half—as well as your income. Will demand (or more accurately, quantity demanded) change in this situation? If nothing else has changed, then quantity demanded will not change.

Why not? The answer is that demand cannot be separated from the concept of opportunity cost. With what happens in our everyday lives, we should all be familiar with this. You choose to play football, but that means you can't be in the band. You may choose to go out on a date with Sarah, but that means you can't go out with Grace. You choose to follow Christ, but that means you can't follow your sinful flesh patterns. You choose to go into the Army after High School, but that (at least temporarily) precludes going to college. There is a cost to every choice, and to demand something is to forego something else.

If the price of jeans goes down, you must consider the opportunity cost of choosing jeans. If your next best alternative was tennis shoes, and their price also went down by the same amount, your opportunity cost is the same. (There could be an income effect (discussed later), which might change our internal assessment of the opportunity cost. But we'll assume no income effect for this example.)

Since the **relative price** of jeans to tennis shoes has not changed, then what you would have to sacrifice to make a choice has not changed. With opportunity cost the same, your demand will not change. Relative prices are simply prices relative to other alternatives. We need to think about *relative price changes*, not just price changes. Relative prices help us think about the implicit opportunity cost when



### Demand cannot be separated from the concept of Opportunity Cost

To demand something means we must choose between alternate means to satisfy a given end. The concept of choice, by definition, means we must forego something. The decision to choose one good is inextricably linked to the value we place on the next best alternative. If the marginal utility of one good changes, we still need to assess the marginal utility of the next best alternative to say what will happen to demand. The marginal utility is the benefit, but it must be compared to its opportunity cost, the next best alternative (and its marginal utility).

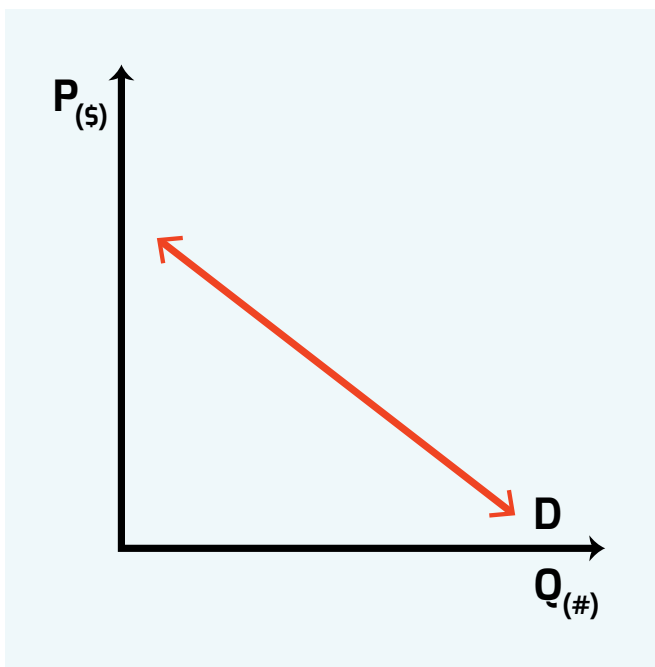
**Relative price:** (definition of this new term will go here)

we assess the impact of changes in price.

Now we're ready to discuss the concept of demand in a more in-depth way. Recall from chapter two that marginal utility decreases as you increase the quantity consumed of a given good. This is a natural result from our assumption that Acting Man will use any good or service against his most urgent need. Any subsequent good or service is applied against the next most urgent need, and so forth. For instance, a woman riding by horseback across the desert may stumble across an oasis. Her first action will likely be to get a drink of water. The next action might be to allow her horse to drink from the water. Then she might decide to take a bath to clean up. Ultimately, she might decide to take a swim in the water. Each use of the water will be applied against a less urgent need than the one before. As her marginal utility of each additional unit of water diminishes, so does her quantity demanded: *ceteris paribus* (all else equal).

Because marginal utility goes down as the quantity consumed increases, the opportunity cost of additional consumption (as represented by the price) must also fall for consumers to demand more. In economics we state this as the **Law of Demand**: as the price of any good goes down, the quantity demanded goes up; and as price goes up, the quantity demanded goes down. It is convenient to think of price as an expression of the opportunity cost, since in a market economy we could take the same money spent on one good and spend it on its next best alternative.

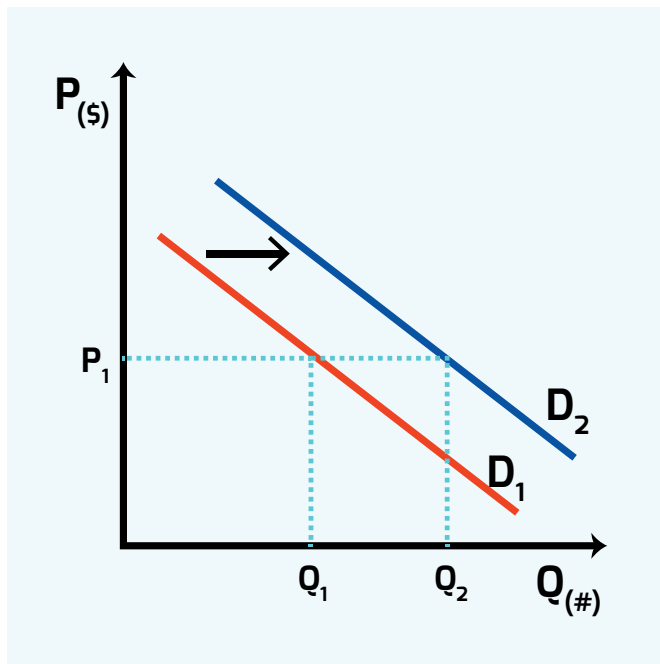
**Law of Demand:** as the price of any good goes down, the quantity demanded goes up; and as price goes up, the quantity demanded goes down.



**Figure 3.1, Notional Demand Curve.** The demand curve always slopes downward, to reflect the decreasing marginal utility provided by additional units of a good or service. The vertical axis is the price and the horizontal axis is the quantity of a good or service. For Acting Man to want more and more of a given item, the price must go down. The arrows are intended to show that you can travel either direction on the curve as price changes.

**Figure 3.1** shows the downward sloping demand curve. Note that the X-axis (horizontal) is quantity demanded, and the vertical or Y-axis is price. You can thank the economist Alfred Marshall for standardizing an unconventional diagram; normally the independent variable (price) is on the horizontal axis with the dependent variable (quantity) on the vertical. Marshall is credited (or blamed!) for this unique way of displaying S&D (although earlier writers preceded him on this point). This P-Q diagram will be used quite a bit in our analysis in economics, so you should get comfortable thinking about demand (and later supply) graphically.

Notice that in this graph the downward sloping demand curve is a function of only one variable: price. This is very important as there are many, many errors made in some of the finest economic media because people refer to demand changing when price changes. As clearly seen in the diagram, there is one demand curve sloping downward as price decreases. Since there is only one demand curve, when price changes we simply move *along*



**Figure 3.2, Increase in Demand.** The demand curve can shift as tastes, income, expectations, etc., change. In this graph, the demand has increased, and the demand curve shifts right/up. Notice that when demand increases, at any given price, the quantity demanded has increased, such as above from  $Q_1$  to  $Q_2$ .

the demand curve to a new position. We should correctly say that when price changes, *quantity demanded* changes. Demand, however, does NOT change. This does not mean, of course, that demand *cannot* change; it simply means that *demand does not change as a result of a change in price*. Demand can and does change for a whole host of reasons—many of which we'll now review. But when demand changes, we do not move left or right along the existing curve, as that only occurs with price changes (and affects the quantity demanded). When demand itself changes, the whole curve must shift either left or right, depending on whether demand has risen or fallen. When demand increases, the entire curve shifts right as seen in **Figure 3.2**. Notice that when the whole curve shifts right, at any given price the quantity demanded increases with the shift in demand. Similarly, if demand falls, the entire curve shifts leftward, and at any given price the quantity demanded falls. So what are the factors that cause demand to change, if not price? I'm glad you asked. Almost anything else can be a factor!

**income:** (definition of this new term will go here)

One variable that affects demand is our **income**. As an income deprived high school or college student, your demand is greatly reduced from what it will be once you have a full time job. As your income rises, your demand for all *normal* goods will increase, although not necessarily proportionally. If demand for a good decreases as income rises, that good is called an **inferior** good. Conversely, when we have a recession in this country, unemployment will rise as additional workers are laid off. The demand curves for these individuals decrease as they're forced to dip into savings and/or live off unemployment insurance. If demand for a good changes little with a change in income, we call that good a **necessity**.

"If demand for a good changes little with a change in income, we call that good a necessity. If demand changes greatly with a change in income, we call that good a luxury."

**necessity:** (definition of this new term will go here)

If demand changes greatly with a change in income, we call that good a **luxury**. Later on I will introduce the concept of **income elasticity of demand** where we will talk more in-depth about the concept of how much demand changes as other factors change.

**income elasticity of demand:** (definition of this new term will go here)

Of course, in order to have a *demand*, you have to demand it! I mean, you have to desire a good. Our individual **tastes and preferences** are a strong driver



### Thinking on the Margin

To illustrate how we think on the margin, and how marginal benefits and marginal costs affect our decision making, consider this example. Imagine you have a 10:30pm curfew. Let's say there are two possible punishments for breaking curfew. The first is being grounded the next weekend. The second is, for every 15 minutes you're late, you're grounded one night.

Now one evening you look down at your watch and it's 10:35—and you're 10 minutes from home. What do you do? The marginal benefits and costs will drive your decision. Under the first rule, you're grounded next weekend regardless—so you might as well stay out all night! Economists would say that the marginal cost of staying out later is now zero. Under the second rule, you'll want to hit the road immediately, and not make the situation worse!

Of course, as good Christians you'll want to head home immediately anyway, but parents (and residence hall directors) had better be aware their children are also fallen and design the marginal costs appropriately!

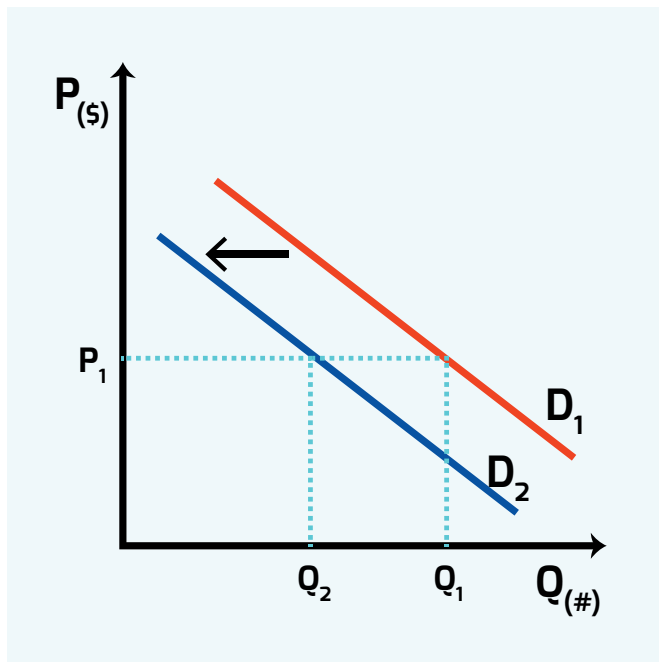
of demand. What is the latest fad and “must have” this year may be in the scrap heap next year. Conversely, taste and preferences for many goods (such as food) may not change much at all. Face it, you have to eat. But you don't have to eat anything in particular. Some food items could see significant change in their demand over time. For example, lard used to be heavily used for cooking, but healthier vegetable oils have significantly reduced the demand for it, as well as the [pigs](#) that supplied it.

Expectations also affect demand. If you expect prices to rise in the future you may increase your demand today. Why not stock up while the price is cheap? Similarly, if you expect the product to be unavailable for whatever reason in the future, you may buy today. People often stock up on groceries before each winter storm or hurricane. After President Obama was re-elected in 2012, many Americans (rightly or wrongly) feared he would institute stricter gun control. So what would economic theory suggest? You guessed it—people went out and bought guns and ammunition.

Expectations of future price changes also invite speculation, and the opportunity to profit from changes in prices. (While speculation is almost always viewed negatively in public discourse, we will see in Chapter 5 that speculation serves a very valuable social purpose.) If a wheat trader expects prices to rise in the future at a rate greater than what she could earn by selling today and investing the profits, she will hold the wheat for future sale. She may even buy more. Likewise, an expectation of a price decline in the future will result in a decrease in current demand as individuals on the margin will try to delay their purchases to take advantage of lower future prices.

Demand can also change as the price of related goods (complements or substitutes for that good) change. Consider hot dogs. If the price of hot dogs rises dramatically, we know from the law of demand that the quantity demanded will fall (look at [Figure 3.1](#) and follow the curve up and to the left to see this). What





**Figure 3.3, Decrease in Demand.** As the quantity demanded of a good decreases (such as our example in the text of hot dogs), complementary goods such as hot dog buns will see a decrease in demand, as in the graph above. At any given price, less buns will be demanded and we move from  $Q_1$  to  $Q_2$ .

**quantity demanded:**  
(definition of this new term  
will go here)

**size of the market:**  
(definition of this new term  
will go here)

would never switch, no matter the price. I don't buy that the demand for chicken necessarily goes up." Can you think why that logic is wrong? Remember, all prices and decisions are determined *on the margin*. It is the marginal decision that matters. At the margin, prior to the rise in the price of beef, there were buyers who were almost ambivalent as to whether they would purchase beef or chicken. It is these buyers who will change their behavior and choose chicken once the price of beef rises. It is irrelevant that the price change may not even influence the majority of buyers. It is the change of behaviors *on the margin* that matters.

A final factor in determining demand is the **size of the market**. If that were to change dramatically, then demand would shift. Consider a baby boom. We all know that baby boomers are coming of age, and soon we will have many more elderly. What do you expect to happen to the demand curve for dentures when the size of our elderly population rises? Yes, demand for dentures will rise, along with complementary goods such as denture cleaners and adhesives. Not fun to think about, but true!

do you think will happen to demand for hot dog buns? Very few people want to buy a bun by itself. Hot dog buns are **complements** to hot dogs—they go together. In this case the demand curve will shift left, as in **Figure 3.3**.

Demand for goods can also be affected by the demand for **substitutes**. A substitute is a good that meets most of the characteristics of another good such that it can replace the other if necessary. A classic example is beef and chicken. If the price of beef goes up, what will happen to the demand for chicken? We know by following the demand curve in **Figure 3.1** that if the price of beef rises, the **quantity demanded** (notice we did *not* say demand) of beef will fall. Since chicken is a substitute for beef, the demand for chicken will rise. The demand curve shifts up and to the right as in **Figure 3.2**. This is because as the relative price of beef to chicken rises, the opportunity cost (of the chicken forgone) of beef increases.

Of course, some critics of economists might say, "I don't even like chicken. I like beef and



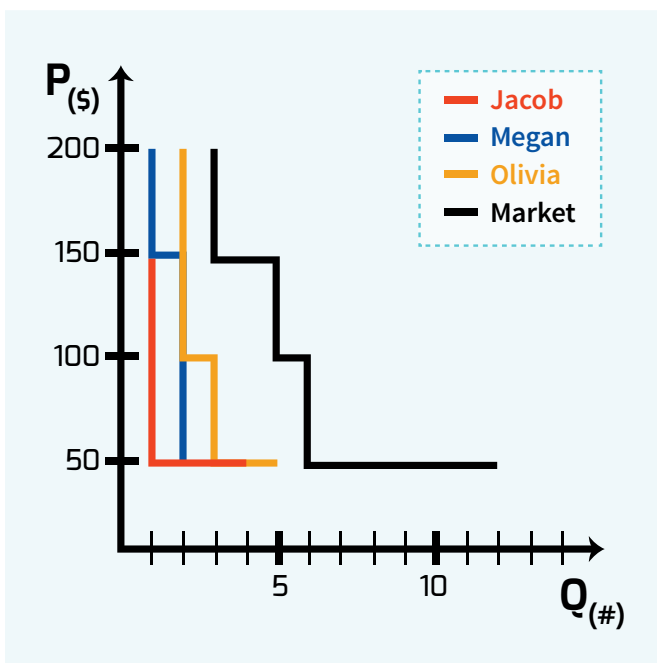
### Factors influencing demand:

1. Income
2. Tastes and preferences
3. Expectations of future prices
4. Prices of related goods
5. Size of the market

## Individual vs. Market Demand

Up until now, we've described demand in very general terms; we have not yet distinguished whose demand this is. We have highlighted why individual marginal utility ultimately drives demand, but we must say more on how a demand curve is derived, which will help us understand the market prices we see in our everyday lives.

Consider three individuals: Megan, Olivia, and Jacob, and their individual demands for 16 GB iPod Nanos. Notice in [Figure 3.4](#) and [Table 3.1](#) that as the price for iPods drop, each of them will demand an equal or greater quantity. And while for simplicity's sake I am using lines to describe demand, the actual demand curve does not have to be linear; it must simply slope downward. If our three are the only individuals in the market, we simply need to sum up their individual demand curves to arrive at a market demand curve.



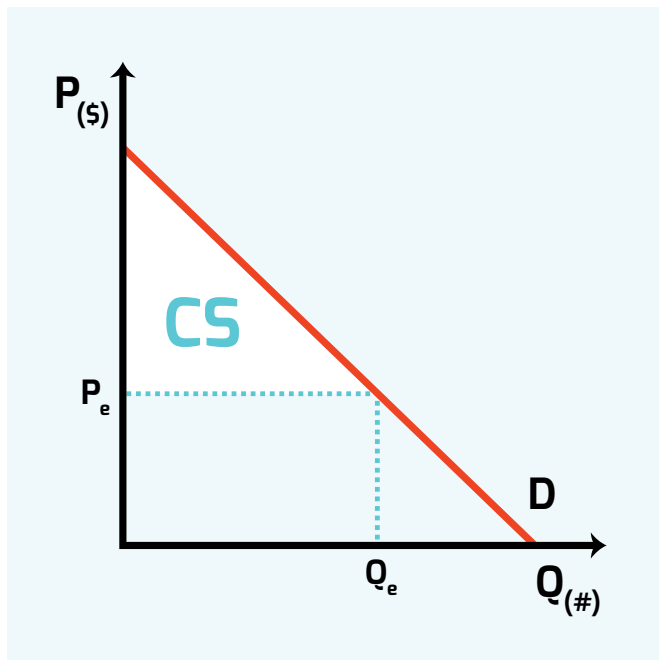
**Figure 3.4, Market Demand Curve for iPod Nanos.** The overall market demand curve is derived by adding up the individual demand curves; in our example, from Jacob, Megan, and Olivia. Note that the demand curves are vertical as we move from one price to the next. This is an artifact of how we added the data increments, but reflects what happens in the real world: you only want iPods in whole increments (i.e., you want 2 or 3 iPods, not 2.257 as the price changes). As the market gets larger and larger, both in terms of people and the quantity of iPods sold, the demand curve will become more smooth.

Price	Megan	Olivia	Jacob	Market
200	1	2	0	3
\$150	2	2	1	5
\$100	2	3	1	6
\$50	3	5	4	12

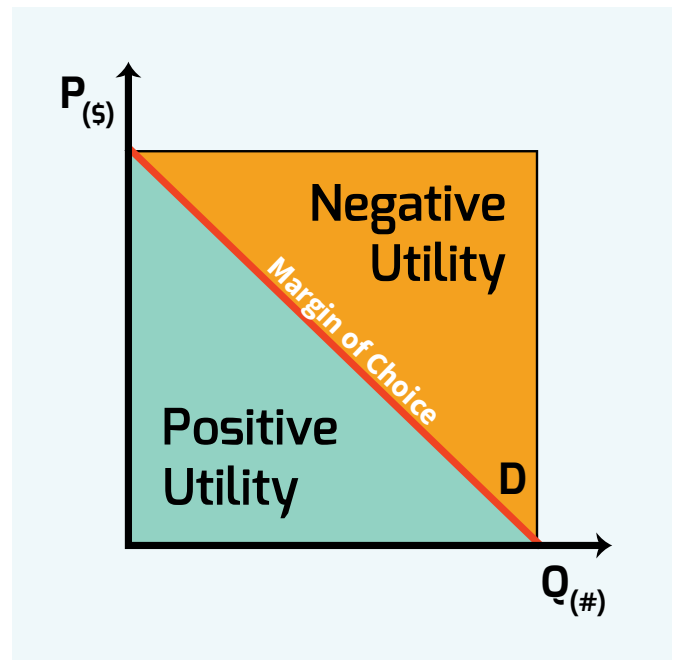
**Figure 3.1, Demand for iPod Nanos.**

A few observations are worth noting about the market demand curve. First, while there is no individual “Mr. Market” (since the market demand curve is simply the summation of individual demand curves), it *must* reflect diminishing marginal utility and therefore slope downward just as if there actually were a Mr. or Ms. Market. Each additional unit provides a smaller increase in utility than the preceding unit and therefore a smaller amount of money will be offered for it. Second, our example is for a very small market. As you increase to the millions of people that actually buy iPods, the demand curve will slope downward but in a smooth fashion (as in [Figure 3.1](#)) rather than having the stair step shape shown in [Figure 3.4](#). Individual demand curves will always have a stair step shape. No one

wants 2.47 Nanos; they want either two or three, but as you add the millions of members to the market curve the stair steps will be so small they will approach a smooth curve.



**Figure 3.5, Consumer Surplus.** At any market equilibrium price and quantity, consumers would have been willing to pay higher prices for the most urgent uses of that good or service, as illustrated by the demand curve. Yet they will only have to pay the market price. The area below the demand curve, but above the dashed line of the equilibrium price reflects what is called the consumer's surplus (shaded in white).



**Figure 3.6, Demand Curve is the margin of decision.**

## Consumer Surplus

In chapter two we identified differences in productive ability as the rationale to explain the possibilities of gains from trade. That explanation showed simply that *everyone has a comparative advantage at something*, due to differences in opportunity costs. This showed that beneficial trade can increase the total output of both parties, and they both can increase consumption. In a similar fashion, our initial review of demand shows the benefits of trade from market transactions with a slightly different perspective: gains in utility. As

*"everyone has a comparative advantage at something"*

**Consumer's surplus:**  
(definition of this new term  
will go here)

seen in **Figure 3.5**, the area above the market (or equilibrium) price but below the demand curve is a gain to the consumer, and is known as the **consumer's surplus**. At each quantity below the equilibrium quantity ( $Q_e$ ), individuals would be willing to pay much more than the market price as they use the good or service in its most urgent application. Yet, those items can also be purchased at the market price, not just the unit  $Q_e$ .

Consider **Figure 3.6**. A helpful way to think of the relationship of utility to demand is to think of anywhere above the demand curve as having negative utility to a potential consumer: the price you pay (and its associated opportunity cost of what other good/service you must sacrifice) is greater than the utility you would gain from that item. So if a soda is worth a dollar to you, but the price is

greater (say \$1.50), then to purchase it would be a subtraction to your overall well-being or utility. *The demand curve is therefore a line representing the marginal decision*—the price is just low enough at the demand curve to prompt a purchase. This is true for both an individual and a market demand curve. Any price greater will subtract from overall utility and therefore the purchase is not made; any price less adds to utility and therefore the purchase is made.

To put the consumer surplus in context, imagine a hot August day where you just finished a long hike. You forgot to bring any water on the hike and you are hot, sweaty and very thirsty. On the drive home, you stop at the first convenience store and purchase a large cool bottle of mineral water for \$1.49. The reality is that if you had no other choice, you would perhaps have been willing to pay \$10 for that first bottle of water—you value the water at \$10. But the market equilibrium price is much less at \$1.49. You obtained a utility gain from what you would have been willing to pay (the value to you) and what you actually had to pay (the market price). Other consumers would also have been willing to pay more, but they also got a benefit of the market price. This works out in the overall demand curve as the area labeled CS in [Figure 3.5](#) and reflects the difference between how the goods are valued by the individual purchaser and the price they actually had to pay. We will see in the next chapter on supply that there is an analogous producer's surplus, and we will then be able to see how the equilibrium or market price is determined.

## Elasticity

Let's now talk about a new concept that will be quite helpful in thinking about the market process. Imagine you are a producer of designer t-shirts. Now, you may have a vision of serving the world, and perhaps t-shirts that are both cool and honoring of Christ is a way to do that; however, wouldn't you be able to serve Christ better if you made a bit more money? After all, with more money, you could expand your product line to serve both God and your customers even better! So you might begin to think, as all entrepreneurs must, about how you can increase your profit. I will say more about this process later, but for now it should be obvious that if you are able to increase the price you receive for your product (remember, *ceteris paribus*!), your profits will go up. Your total revenues will go up, since we define total revenues as the product of price times quantity:

$$TR = P \times Q$$

Perhaps you should raise your prices if you want to increase your profits. Remember, we are assuming *ceteris paribus*—all else equal—therefore your costs aren't changing. As with any decision, we will answer to God for how we set a price (Matthew 12:36; Romans 14:12). If the attitude is one of increasing profits to more effectively expand the business to serve others, we're probably ok. But if the attitude is one of how much I can "squeeze" out of my customers so I can get rich, that's an indication that we are not acting out of love toward our

neighbor. Thanks to my colleague Patrick Oliver of reminding me of the importance of noting this—Christians in business should be acting differently. But the question you need to ask is, “if I raise my price on my [signature Lecrae t-shirt](#), will people still keep buying them?” Here is where a new concept called elasticity will help you. The **price elasticity of demand** helps us understand how the quantity demanded of a good will change when its price changes. We know from the Law of Demand that if the price rises, the quantity demanded will fall; but by how much? If it only falls a little and you are able to charge a lot more, it may still make sense to raise your price. But if you raise the price a penny and everyone stops buying, you would greatly regret the change. Entrepreneurs, therefore, must understand the nature of their product’s market and have some understanding of consumer demand if they want to maximize their profits.

“The price elasticity of demand helps us understand how the quantity demanded of a good will change when its price changes.”

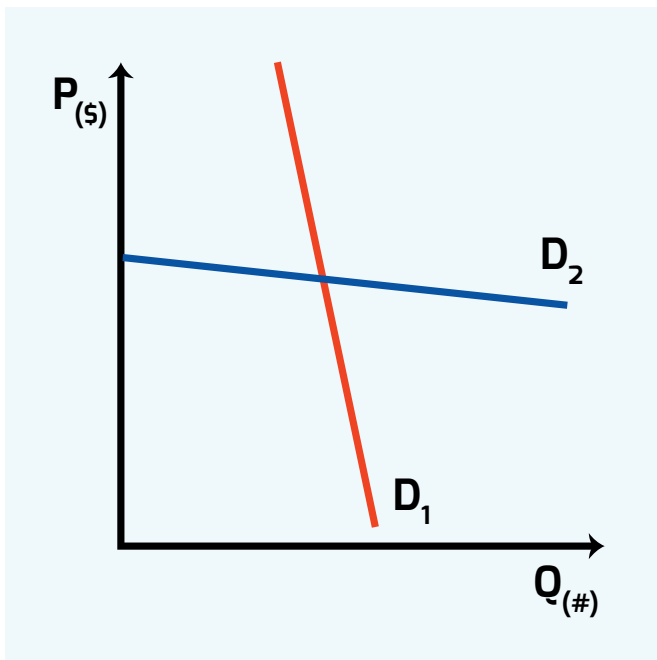
**inelastic:** (definition of this new term will go here)

As you may suspect, the price elasticity of demand has a relationship to the slope of the demand curve: demand curves always slope downward, but can vary in the steepness as seen in [Figure 3.7](#) (and they aren’t necessarily linear, even though we usually show linear curves in the text for simplicity). The demand

curve,  $D_1$ , is very **inelastic**, which means that the quantity demanded does not change much with a change in price. An example of this type of good might be gasoline. At least in the short term, when the price of gas goes up, we simply pay it—since we have little alternative. Over the longer term, there are options to reduce gasoline usage such as buying more efficient cars.

The blue demand curve is more elastic, and the quantity demanded is greatly affected by the price. A product that might fit this type of demand curve could be fountain drinks at 7-eleven. There is not a great deal of difference between a fountain drink at 7-eleven and a fountain drink at any other convenience store (although their marketing department may want you to think so!). If 7-eleven raises their prices while others keep their prices the same, many of their customers will switch (especially those just dropping in for a fountain drink).

So what determines whether a product is more elastic or inelastic? I’ve already mentioned a couple of factors, but let’s go a bit more in-depth. First,



**Figure 3.7, Elasticity of Demand.** Both demand curves follow the Law of Demand and slope downward. The demand curve  $D_1$  is steeply sloped and is an **inelastic** demand curve, which means the quantity demanded is relatively insensitive to price changes. The **Elastic** demand curve  $D_2$  has a more gentle slope, and the quantity demanded is relatively sensitive to price changes.

demand curves tend to be more inelastic in the short term. People are creatures of habit and continue in their shopping patterns for a period of time even with prices hike. In some cases, they may not have many short run options, such as our gasoline example. But in the long run, they can change their behavior. Another example is blood pressure medicine. If the price is hiked, there are not a lot of short-term alternatives; but in the longer term it might make sense to exercise more and eat better so one doesn't need medicine. Of course, it makes sense independent of the price hike, but perhaps this will influence the behavior. Remember, incentives matter!

Another factor is the closeness of substitutes. Sometimes this is related to the first issue of time; consumers may not be as aware of other alternatives when the price is lower, but as the price rises, they begin to look for and consider other options. My wife, for instance, doesn't believe there are any substitutes for Heinz brand ketchup. But if the price rises high enough, she may very well consider alternatives.

Of course, given how little we spend on ketchup, it might take a very dramatic price rise for her to consider substitutes. This is our third factor influencing elasticity, or how much of our budget we spend on a good. Goods that consume a larger portion of our budget tend to be more elastic; we'll look for opportunities to save money when a large budget item's price goes up. Because it takes a large part of the budget, the opportunity cost of an increase in price is relatively large, so we have an incentive to "shop around." Goods that consume less of our budget will tend to be more inelastic, since even if the price rises there is little opportunity cost. We tend to not to see any impact on our overall budget and thus don't change our behavior.

## Elasticity Defined

We've seen how the **Price Elasticity of Demand** is related to the slope of the demand curve, but it is NOT the slope. The slope of any line is very much dependent upon the scale given. For example, the same demand curve that looks very "inelastic" when the vertical price axis is in pennies, may look very "elastic" if we changed the scale to be in hundreds of dollars. So to actually calculate elasticity, we need to be a bit more precise and avoid a measure that depends



### Price Elasticity of Demand *Influenced by:*

1. **Time:** As time passes after a price change, the demand curve becomes more elastic as people discover substitutes
2. **Substitutes:** The more substitutes are available, the more elastic the demand curve becomes.
3. **% Income spent:** The higher the % of income spent on a good, the more elastic the demand curve will be.

on our choice of measurement units. The formal definition is as follows: Price Elasticity of Demand equals the percentage change in quantity demanded divided by the percentage change in price; or:

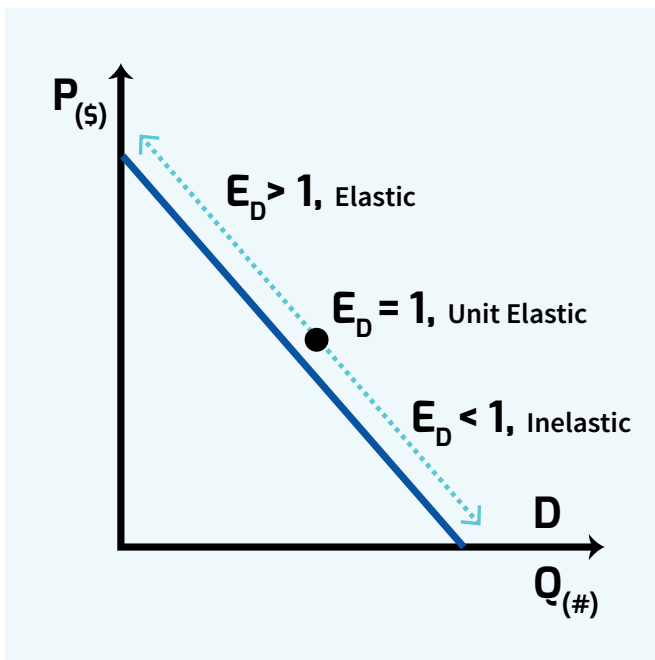
$$E_D = \frac{\% \text{ change in } Q_D}{\% \text{ change in } P}$$

With this definition, elasticity is calculated as a negative number (since price and quantity are inversely related), but it is common convention to drop the negative number in discussing elasticity of demand.

Another reason (beyond the slope being affected by the units of measurement) for using the more formal definition is that the price elasticity of demand changes along a linear demand curve, as seen in [Figure 3.8](#). (It is beyond our scope to demonstrate the calculation of numbers for [Figure 3.8](#), but the interested reader can do a quick web search on “price elasticity of demand for linear demand curve” and find many examples of this calculation.)

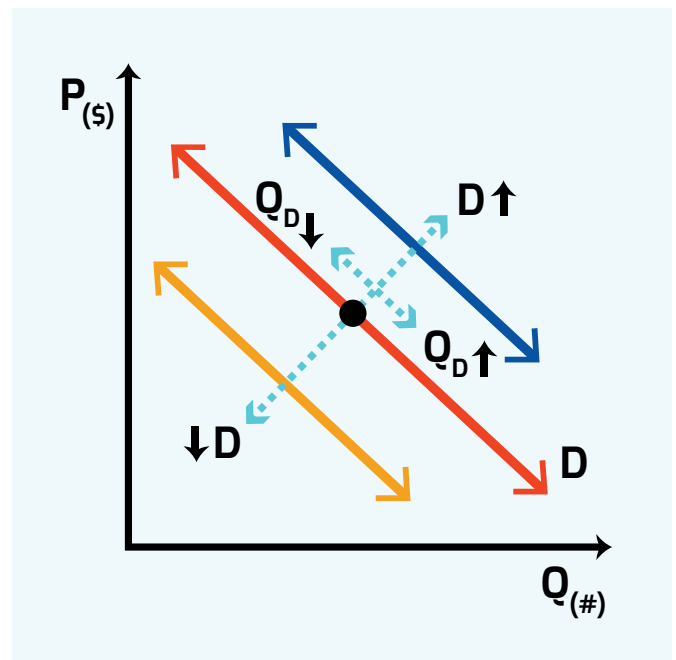
## Wrap Up

[Figure 3.9](#) summarizes what we’ve learned about how demand works. Demand curves always slope downward (it’s a very convenient memory tool to recognize



**Figure 3.8, Change in Elasticity along linear demand curve.**

The midpoint of a linear demand curve is unit elastic. The demand curve is elastic above this point and is inelastic below it.



**Figure 3.9, Change in Demand & Change in Quantity Demanded ( $Q_D$ ).**

A change in demand, such as when income rises or falls, will result in the demand curve shifting right or left, from the red curve above to either the orange curve (income falling) or the blue curve (income rising). When prices change, the quantity demanded will change with movement along the curve. When prices rise, quantity demanded will fall with movement along the demand curve up and to the left. When prices fall, the quantity demanded will increase, with movement along the curve down and to the right.



that the Demand curve always slopes Down). Movement along a demand curve is ONLY due to changes in price; we speak of the “quantity demanded” changing when price changes. When demand changes (any change besides a change in price, such as income, price of substitutes, etc.), the entire demand curve shifts to the right or left, like the blue and orange curves in [Figure 3.9](#).

We now have a new tool in our tool bag: the concept of demand. But in a way, this is only one-half of the equation. After all, we need supply *and* demand to be able to understand markets and the world we live in. The great economist Alfred Marshall used the analogy of a pair of scissors to describe how supply and demand interact—as both forces operate to determine market prices. Nevertheless, it is appropriate for us to begin with demand, because every demander is also potentially a supplier, as we’ll see in the next chapter. The good news is that supply and demand is not [like this](#).





# Great Economists in History

## Carl Menger

1840-1921

[Carl Menger](#) was the father of the Austrian school of economics, and more importantly, the father of the neoclassical revolution in value theory. Classical economists Adam Smith and David Ricardo had systematized and made a social science of the field of political economy, but they were unsuccessful in fully explaining the question of value. Why was water—so much more useful than diamonds—so much less valued? They struggled because they saw value embedded in labor: the labor theory of value.

Menger realized that value was not objectively determined by how much labor went into the production of a good, but rather was subjectively imputed by consumers. Further, along with W.S. Jevons and Leon Walras, Menger was credited with the discovery of value being determined by marginal utility (Walras, Menger and Jevons all reached the same conclusion independently around the same time and thus are equally regarded for this discovery).

Menger's breakthrough work, [Principles of Economics](#), was published in 1871 and heralded a new way of looking at economic phenomenon. Gone was the fruitless search for objective value; application of subjective value by Acting Man would transform the way economics was understood. The role of the consumer and the importance of marginal decision makers would revolutionize price theory.

Menger ushered in not only a new way of thinking, but he was also a powerful influence on economists that followed him. Eugene Bohm-Bawerk (capital theory) and Friedrich Weiser (opportunity cost) were both followers of Menger. Without Menger, we never would have had Nobel Laureate, F.A. Hayek, or a Ludwig Von Mises. Menger unfortunately spent much of his professional energies in fighting a philosophical battle with the German historical school, failing to ever update his *Principles* text, which he considered incomplete (Skousen, p. 183).

Menger introduced the beginnings of a robust capital theory by outlining the structure of production. He noted that goods of the first order were consumer goods, but there were higher order goods above the final consumer good which were used to produce that final good. And above those higher order goods, there would still be higher order goods—producer's goods which might make machines that could ultimately produce consumer's goods. Critical to this structure of production was time, with higher order goods separated from consumer goods by time. His disciples would make much use of this in capital and business cycle theory.



## Chapter Three: Questions for Review

1. Describe how our individual budget constraint (how much income you have, say, per month) relates to opportunity cost and your demand for an individual good or service.
2. Why is the concept of opportunity cost inseparable from the Law of Demand?
3. Describe a situation (i.e., make an example) of where a change in the price of any item changes a relative price and causes a change in demand.
4. Do the following represent factors that change *demand*, or change *quantity demanded*?
  - a. Your boss gives you a raise.
  - b. You wear a new outfit of a particular style and the person you really like gives you very positive feedback.
  - c. The price of an iPhone goes down, so you buy one.
  - d. Government Motors raised prices on new cars by 10%, so you decide to buy a Honda (this question is asking about demand of Hondas, not the GM).
5. When your boss gives you a raise, you decide to get rid of your Chevy Cobalt and instead get a Camaro. What can you say about whether either car is a luxury or a necessity?
6. Draw a demand curve, with correct labeling of the axes. Now, assume that you just learned that “helicopter” Ben Bernanke (who prints the money in the U.S.) plans to double the money supply in the U.S. to “stimulate” the economy. Even though we haven’t reviewed the money chapter yet, you know this can’t be good and expect prices to rise when he goes on his printing binge. What will happen to the demand curve based on your change in **expectations**? The hint is the bold word!
7. True or False. Since the price of salt is a very small part of a person’s budget, one can absorb a price increase (say a doubling of the price) without seemingly even knowing the price went up. That means that when the price doubles, the quantity demanded will not change. Explain your rationale.
8. Explain what economists mean when they talk about a “marginal” decision.
9. True or False. While individual demand curves must slope down (because of diminishing marginal utility), the market demand curve does not have to slope down.



10. Is it possible to have a consumer surplus of zero for all consumers? If that is possible, what would have to be true about demand?
11. What is the definition of elasticity? Why is this term important to understand demand?
12. Will the following tend to make the demand curve for gasoline more inelastic or more elastic?
  - a. As time progresses from the short run to the long run (say 5 years later).
  - b. A new form of alternative fuel becomes viable and is cost competitive with gasoline.
  - c. The economy goes further down and you lose your job and have to live off savings.