LECTURE NOTES ON
MACROECONOMIC PRINCIPLES

Peter Ireland

Department of Economics

Boston College

peter.ireland@bc.edu

http://www2.bc.edu/peter-ireland/ec132.html

Ch 4 The Market Forces of Supply and Demand

Introduction

Microeconomics studies how households and firms make decisions and how they interact in markets.

Macroeconomics studies the economy as a whole.

Microeconomists use the theory of supply and demand to understand:

1. How buyers and sellers in an individual market for a particular good behave.
2. How the interactions between those buyers and sellers work to determine the quantity of the good that gets produced and the price at which the good gets bought and sold.
3. How various events impact on quantities and prices in markets for individual goods.

A course in the Principles of Microeconomics looks at the theory of supply and demand in great detail, tracing out its many implications.

But, as we will see, macroeconomists often need to rely on the theory of supply and demand as well.

And for that reason, we'll begin this course in the Principles of Macroeconomics with a quick look at the theory of supply and demand.

Outline

1. Demand
    A. The Demand Curve
    B. Shifts in the Demand Curve
2. Supply
    A. The Supply Curve
    B. Shifts in the Supply Curve
3. Supply and Demand
    A. Equilibrium
    B. Analyzing Changes in Equilibrium
        i. A Change Due to a Shift in Demand
        ii. A Change Due to a Shift in Supply

Demand

Let's begin by considering the behavior of buyers in a particular market for a particular good: ice cream.

The Demand Curve

The **quantity demanded** of any good is the amount of that good that buyers are willing and able to purchase.

Although there are many factors that determine the quantity demanded of any good, one chief determinant of the quantity demanded is the price of the good.

Ask yourself: suppose the price of an ice cream cone goes up – does that make you more likely or less likely to buy an ice cream cone on any given day? Does that price increase mean you will buy more or fewer ice cream cones over the course the next year?

For most people and most goods, a higher price means a smaller quantity demanded.

This is what microeconomists call the **law of demand**: the idea that, all other things being equal ("ceteris paribus," as Ancient Romans and modern scientists would say), the quantity demanded of a good falls when the price of that good rises.

A **demand schedule** is a table showing the relationship between the price of a good and the quantity demanded.

A **demand curve** is a graph showing the relationship between the price of a good and the quantity demanded.

Microeconomists have adopted the convention that, in a supply-and-demand diagram, the quantity of the good is measured along the horizontal (x) axis and the price of the good is measured along the vertical (y) axis.

The law of demand says that **the demand curve slopes downward**.

Figure 1 shows an example of an individual buyer's demand schedule and demand curve. Figure 2 shows how the demand for a good in the market as a whole gets determined by adding up the demands of all individual buyers.

Shifts in the Demand Curve

The downward-sloping demand curve summarizes how the quantity demanded changes as the price rises or falls, **holding everything else constant.**

The demand curve shifts to the left or to the right when some event occurs to change the quantity demanded **at any given price**.

Figure 3 illustrates how a demand curve shifts to the left or to the right.

Why might the demand curve for ice cream shift?

1. Income rises, so that people can afford more ice cream cones **at any given price**.

2. The prices of goods that are close substitutes for ice cream change. Suppose, for instance, that the price of frozen yogurt goes up. Then some people who used to buy frozen yogurt will switch to ice cream instead. The quantity of ice cream demanded goes up **at any given price**.
3. "Tastes" change. People decide they like ice cream more, so that they buy more **at any given price**.

Supply

Now let's consider the behavior of sellers in a particular market for a particular good: ice cream.

The Supply Curve

The **quantity supplied** of any good is the amount of that good that sellers are willing and able to produce and sell.

Although there are many factors that determine the quantity supplied of any good, one chief determinant of the quantity supplied is the price of the good.

Ask yourself: suppose you own and operate an ice cream stand and the price of an ice cream cone goes up – does that make you more or less willing to work harder to make and sell more ice cream cones?

For most business owners producing and selling most goods, a higher price means a larger quantity supplied.

This is what microeconomists call the **law of supply**: the idea that, all other things being equal, the quantity supplied of a good rises when the price of that good rises.

A **supply schedule** is a table showing the relationship between the price of a good and the quantity supplied.

A **supply curve** is a graph showing the relationship between the price of a good and the quantity supplied.

The law of supply says that **the supply curve slopes upward**.

Figure 5 shows an example of an individual seller's supply schedule and supply curve. Figure 6 shows how the supply of a good in the market as a whole gets determined by adding up the supplies of all individual sellers.

Shifts in the Supply Curve

The upward-sloping supply curve summarizes how the quantity supplied changes as the price rises or falls, **holding everything else constant.**

The supply curve shifts to the left or to the right when some event occurs to change the quantity supplied **at any given price**.

Figure 7 illustrates how a supply curve shifts to the left or to the right.

Why might the supply curve for ice cream shift?

1. Input prices rise, so that it costs more to make and sell and ice cream cone. Then sellers will produce fewer ice cream cones **at any given price**. Note that input prices include not just the price of ingredients like milk and sugar, but also the "prices" of hiring workers (wages) and renting or buying buildings and land to run the business.
2. "Technologies" can change. If a new machine makes it easier and less time-consuming to make and sell ice cream cones, then sellers will be willing to supply more ice cream **at any given price**.

Supply and Demand

Having first looked at supply and demand individually, now let's see how supply and demand interact to determine the quantity and price of a good sold in a particular market.

Equilibrium

Since the demand curve slopes down and the supply curve slopes up, they will intersect at only one point. At this intersection point, quantities supplied and demanded are equal.

For ice cream, this means there are no unsold ice cream cones melting away (no "excess supply") nor are there shortages that leave potential buyers who would like to buy an ice cream cone at prevailing prices unable to do so (no "excess demand").

Figure 8 shows this **equilibrium**: a situation in which the market price has reached the level at which quantity supplied. The price at the intersection point is the **equilibrium price** and the quantity is the **equilibrium quantity**.

"Equilibrium" is sometimes referred to synonymously as "market clearing," since in an equilibrium, again, buyers have bought all they want to buy and sellers have sold all they want to sell.

How and why does the price of a good adjust so as to bring about a market equilibrium? This is illustrated in figure 9:

- Suppose first that the price of an ice cream cone is above the equilibrium price. At this price, there will be a **surplus** (that is, a condition of "excess supply"): a situation in which the quantity supplied is greater than the quantity demanded. Since sellers will have a bunch of ice cream cones that they would like to sell but cannot, they will have an incentive to lower the price in order to sell off the surplus. This downward pressure on the price will continue until the price reaches the equilibrium price.
- Suppose instead that the price of an ice cream cone is below the equilibrium price. At this price, there will be a **shortage** (that is, a condition of "excess demand"): a situation in which the quantity demanded is greater than the quantity supplied. Buyers will have to wait in line to buy ice cream cones since more are being demanded than sellers are willing to supply. Sellers, seeing these conditions, will realize that they can raise prices. This upward pressure on the price will continue until the price reaches the equilibrium price.

These ideas are summarized by the **law of supply and demand**: the idea that the price of any good adjusts to bring the quantity supplied and the quantity demanded of that good into balance.

Analyzing Changes in Equilibrium

Finally, let's complete our analysis by considering how various events can affect the equilibrium quantity and price in an individual good in an individual market.

To do this, it is helpful to work through the following three-step procedure:

1. Decide whether the event shifts the supply curve or the demand curve.
2. Decide in which direction the relevant curve shifts.
3. Use the supply-and-demand diagram to determine the effect on the equilibrium price and quantity.

A Change Due to a Shift in Demand

Suppose that a hot summer makes people want to eat more ice cream.

1. This change in "tastes" shifts the demand curve for ice cream.
2. Since buyers demand more ice cream at any given price, the demand curve shifts to the right.
3. As shown in figure 10, the equilibrium quantity rises and the equilibrium price rises as well.

Before moving on, let's consider the economics behind the graphical analysis.

The change in weather affects people's tastes for ice cream, that is, it affects the demand for ice cream.

So it is not surprising that the quantity demanded rises in equilibrium.

But why does the quantity supplied rise as well? That is, what makes sellers more willing to produce more ice cream cones?

It is not that the hot weather automatically makes sellers want to supply more ice cream cones (in fact, the hot weather may make them want to supply *less*, either because the hot weather makes them want to take time off to go to the beach themselves or because the hot weather makes them tired and wanting to work more slowly – but let's keep things simple and ignore these effects – still, it is true that the hot weather doesn't automatically work to increase the quantity supplied).

Instead, it is the rise in the equilibrium price that calls forth the increase in supply: sellers see that the price has gone up, and that increase in price is what makes them want to supply more.

So in this example, there is **a shift in the demand curve** and **a movement along the supply curve**. Or, a change "in demand" and a change "in the quantity demanded," but only a change in the "quantity supplied" and not a change "in supply."

A Change Due to a Shift in Supply

Next, let's suppose that a hurricane destroys some of the sugar crop in the southern US. This will drive up the price of sugar, making it more expensive to make ice cream cones as well.

1. This change in an input price shifts the supply curve for ice cream.
2. Since fewer ice cream cones are supplied at any given price, the supply curve shifts to the left.
3. As shown in figure 11, the equilibrium quantity falls and the equilibrium price rises.

Again before we quit, let's consider the economics behind this graphical analysis.

The rise in sugar prices affects sellers' willingness to make ice cream cones, that is, it affects the supply of ice cream.

So it is not surprising that the quantity supplied falls in equilibrium.

But why does the quantity demanded fall as well? That is, what makes buyers less willing to buy ice cream cones?

It is not that the rise in sugar prices automatically makes sellers want to buy fewer ice cream cones. Instead, it is the rise in the equilibrium price that induces people to buy less: buyers see that the price has gone up, and it is that increase in prices that cause them to demand less.

So in this example, there is a **shift in the supply curve** and **a movement along the demand curve**. Or, a change "in supply" and a change "in the quantity supplied," but only a change in the "quantity demanded" and not a change "in demand."

These examples illustrate how, in a market economy, changes in prices act to coordinate the activities of individual buyers and sellers, each of whom reacts to events as best as he or she can, without worrying about the overall effects on the market as a whole.

In a market economy, for instance, no one tells individual consumers how many apples to buy and no one tells individual farmers how many apples they should grow. To review the ideas from this chapter, ask yourself:

1. What happens in a market economy if, suddenly, everyone decides they want to eat apple pie? Why would farmers decide to grow more apples to accommodate this "change in tastes?"
2. What happens in a market economy if bad weather ruins this year's crop of apples? Why would consumers – even those in other parts of the country where the weather has still been good – decide to eat fewer apples because of the shortage?
3. What happens in a market economy if an explosion at a big oil refinery disrupts supplies of gasoline? Why would motorists – even those who haven't heard about the refinery explosion – choose to "conserve energy" by making fewer trips to the gas station during the temporary shortage?
4. What happens in a market economy if technological advances make it possible for companies to manufacture big screen TVs at a much lower cost? Why would more consumers – even those who don't keep up with the latest news about LCD and plasma displays – choose to buy big screen TVs as a result of these technological changes?