***Chapter 2***

***Supply and Demand***

**CHAPTER OUTLINE**

Managerial Problem: Carbon Taxes

2.1 Demand

The Demand Curve

The Demand Function

Using Calculus: Deriving the Slope of a Demand Curve

Summing Demand Curves

Mini-Case: Summing Corn Demand Curves

2.2 Supply

The Supply Curve

The Supply Function

Summing Supply Curves

2.3 Market Equilibrium

Using a Graph to Determine the Equilibrium

Using Algebra to Determine the Equilibrium

Forces That Drive the Market to Equilibrium

2.4 Shocks to the Equilibrium

Effects of a Shift in the Demand Curve

Q&A 2.1

Effects of a Shift in the Supply Curve

Managerial Implication: Taking Advantage of Future Shocks

Effects of Shifts in both Supply and Demand Curves

Mini-Case: Genetically Modified Foods

Q&A 2.2

2.5 Effects of Government Interventions

Policies That Shift Curves

Mini-Case: Occupational Licensing

Price Controls

Mini-Case: Venezuelan Price Ceilings and Shortages

Sales Taxes

Q&A 2.3

Managerial Implication: Cost Pass-Through

2.6 When to Use the Supply-and-Demand Model

Managerial Solution: Carbon Taxes

**MAIN TOPICS**

**1. Demand:** The quantity of a good or service that consumers demand depends on price and other factors such as consumer incomes and the prices of related goods.

**2. Supply:** The quantity of a good or service that firms supply depends on price and other factors such as the cost of inputs and the level of technological sophistication used in production.

**3. Market Equilibrium:** The interaction between consumers’ demand and producers’ supply determines the market price and quantity of a good or service that is bought and sold.

**4. Shocks to the Equilibrium:** Changes in a factor that affect demand (such as consumer income) or supply (such as the price of inputs) alter the market price and quantity sold of a good or service.

**5. Effects of Government Interventions:** Government policy may also affect the equilibrium by shifting the demand curve or the supply curve, restricting price or quantity, or using taxes to create a gap between the price consumers pay and the price firms receive.

**6. When to Use the Supply-and-Demand Model:** The supply-and-demand model applies very well to highly competitive markets, which are typically markets with many buyers and sellers.

**OVERVIEW**

This is obviously an important chapter, and while much of this material will be review for many students, a good, solid understanding of the basics here will pay big dividends later.

***Demand:*** This is a good place to begin because most students have experience thinking about market situations from the perspective of a consumer. Whether students have been exposed to this material previously or not, one of the trickiest parts in this section is the distinction between a change in price and a change in any of the other determinants of demand. The former, of course, leads to a change in quantity demanded and a movement along the demand curve, while the latter leads to a change in demand and a shift of the entire demand curve. It is helpful to point out that this distinction is somewhat artificial and is driven by the fact that the demand relationship is being represented graphically in two dimensions. Depending on the mathematical preparation of the class, it can be very helpful to discuss the demand relationship algebraically without worrying about drawing the diagram. This allows for multiple right hand side variables in the demand function and no concern about which one leads to which type of change. For some students, this can be an eye-opening observation.

***Supply:*** The discussion here parallels the discussion in the section on demand. The biggest difference is that students are not as familiar with taking the perspective of a producer, so additional discussion might be necessary to get them thinking in this way. The same technical concern arises with a shift in the supply curve versus a movement along the curve, but it can be handled the same way that it was in discussing demand.

***Market Equilibrium:*** If there is one result that students are likely to recall from past coursework, it is the fact that the intersection of the supply and demand curves marks the equilibrium point in the market. Despite this familiarity, however, it is important to take the time to work through any parts of the discussion that are new (e.g., solving for equilibrium price and quantity algebraically).

It is often easiest to remind students of why the intersection of supply and demand is the equilibrium by considering prices that are both higher and lower. Label the (potential) equilibrium price in the diagram and then ask students to think about high prices (those above this proposed value) and low prices (those below this value). It should be relatively easy for students to recall and see that at high prices, there is a surplus where quantity supplied exceeds quantity demanded. It also should be relatively easy for them to suggest that prices should fall in this circumstance. Likewise, at low prices there will be a shortage as quantity demanded exceeds quantity supplied. This disequilibrium should lead to rising prices. This leaves only the point where quantity supplied equals quantity demanded as the spot where there is no market pressure for prices to rise or fall, that is, the market is in equilibrium.

***Shocks to the Equilibrium:*** This is the basic story of comparative statics. Students likely will be familiar with this type of analysis from a graphical, qualitative perspective, but it is a good idea to spend some time showing them how the same analysis can become more quantitative in the presences of specific functional forms for supply and demand. This is an opportunity to practice some basic algebra skills and also serves as motivation for the estimation of demand and supply functions that will be coming up in Chapter 3.

***Effects of Government Interventions:*** Two topics are here: (1) price ceilings and floors and (2) sales taxes. The discussion on price ceilings and floors should be pretty straightforward after discussing equilibrium and why prices above and below market equilibrium are not balanced. An effective price ceiling or floor essentially creates a persistent disequilibrium with a resulting excess shortage or surplus. Take care to emphasize that not all price ceilings and floors result in disequilibrium and that it is important to compare the price restriction to the actual market equilibrium to determine whether there will be any effect.

The discussion on sales taxes is less intuitive and often takes work for students to understand. The key result is that the effect of tax is determined solely by the nature of supply and demand and not by the administrative decision about who should remit the tax to the taxing authority. Perhaps the most effective way to make this point (and it provides good practice as well) is to work through a numerical example. It also can be helpful for students to work out and discuss the results of taxes imposed in markets with extreme supply and demand relationships (vertical or horizontal supply and/or demand curves).

***When to Use the Supply-and-Demand Model:*** This short section makes the important point that not all market situations are suitable for analysis with the supply-and-demand model. Take a few minutes to point out that this model is a description of a competitive market to help students avoid the common mistake of misapplying these results later on.

**TEACHING TIPS**

***Is This Economics or Chemistry?:*** One of my favorite examples to use when teaching about equilibrium and comparative statics in the supply-and-demand model involves a trip down memory lane. I tell students the story of my first chemistry lab as a young lad in high school. What was so interesting about this lab experience, and the way it relates to teaching about equilibrium, is that the exercise involved a period of great disequilibrium. In the chemistry experiment, this disequilibrium took the form of a bubbling, stinky liquid. The experiment started with all the chemicals in equilibrium—a beaker with a clear liquid, a test tube with a gray powder, etc. The task for the lab was to mix them together and, based on the changes that occurred, determine the identity of each of the original components. So initial equilibrium was followed by bubbling and stinky, which, in turn, was followed by a new equilibrium. We then compared the starting point to the ending point—essentially doing comparative statics in chemistry lab.

***A Classroom Experiment:*** This topic more than any other in the course lends itself to a demonstration in the form of a classroom experiment. Students can the experience seeing an equilibrium price and quantity develop many different ways, but one of my favorites is from Charlie Holt [Holt, Charles A., “Classroom Games: Trading in a Pit Market,” *Journal of Economic Perspectives,* 10:1 (Winter 1996), 193–203]. The beauty of an exercise like this is that it gives students the opportunity to really feel market forces at work. You can spice up the experiment by bringing along some prizes (candy bars work well) to get everyone motivated to play seriously.

**ADDITIONAL DISCUSSION QUESTIONS**

1. Explain why the difference between a shift in the demand curve and movement along the demand curve is so important. Explain why it becomes less important once we leave two-dimensional diagrams behind.
2. Can you think of examples of taxes that are paid largely by consumers? What about those that are likely to be paid by producers? Explain why who pays is different from who is responsible for sending the tax money off to the taxing authority.
3. Give an example of a market that is likely to be similar to the supply-and-demand model presented here. Can you give an example of one that is very different?
4. What are sales and income tax rates in your state? What would happen if these taxes were reduced and a carbon tax took their place? Do you think this is a good idea?