

## ADDITIONAL TOPICS CHAPTER 3

### Using the supply and demand model: a case study

Economists use the supply and demand model both to explain past observations about prices and to predict what would happen to prices under different scenarios. The hypothetical example of the bicycle market discussed in this chapter has been useful for defining and explaining general features of the supply and demand model. But now we want to show how to apply the model in real-world situations. In real-world applications, economists have to decide exactly what goods are included in the market and the time period for the application. To illustrate the application of the supply and demand model, we look in detail at some actual events in a specific market — the peanut market in the United States.

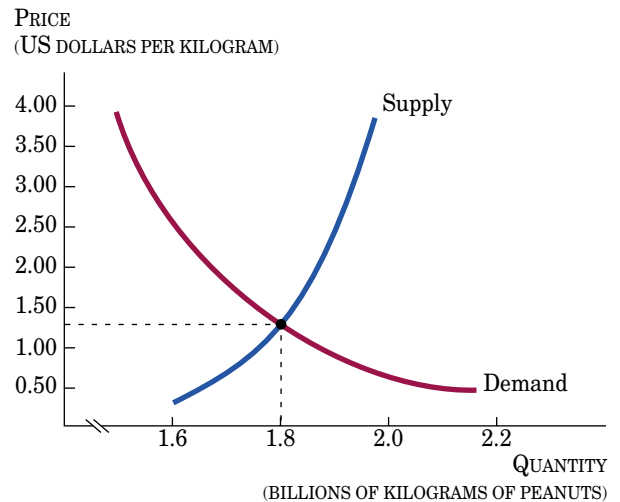
#### Explaining and predicting peanut prices

To apply the supply and demand model to the peanut market, we need to know a little about where the peanuts are produced and consumed. Most peanuts are produced on farms in the south-eastern States of the United States. The biggest peanut-producing State is Georgia, but peanuts are also produced in Alabama, Florida, North Carolina, Texas, Oklahoma and Virginia. The United States produces about 1.8 billion kilograms of peanuts. Georgia produces over 0.8 billion kilograms of that 1.8 billion kilograms.

The demand for peanuts comes from consumers all over the United States. People throughout the country eat peanuts and peanut butter. The US government uses peanut butter in the school lunch program. In addition, Canadians buy US peanuts. In sum, about 1.8 billion kilograms of US-produced peanuts are consumed each year in the United States and Canada.

Figure 3A.1 shows a supply and demand model for peanuts. The model is an accurate description of the peanut market based on many observations over the years. You can see that the demand curve for peanuts is downward sloping. In the diagram, prices range from US\$0.45 a kilogram all the way to US\$4.00 a kilogram for raw shelled peanuts. As you can see, when the price of peanuts is high, the

quantity demanded is low. The supply curve shows that at a higher price farmers will want to produce more peanuts. The equilibrium price is shown to be US\$1.30 a kilogram and the equilibrium quantity about 1.8 billion kilograms. These are close to the actual price and quantity of peanuts in early 1990.



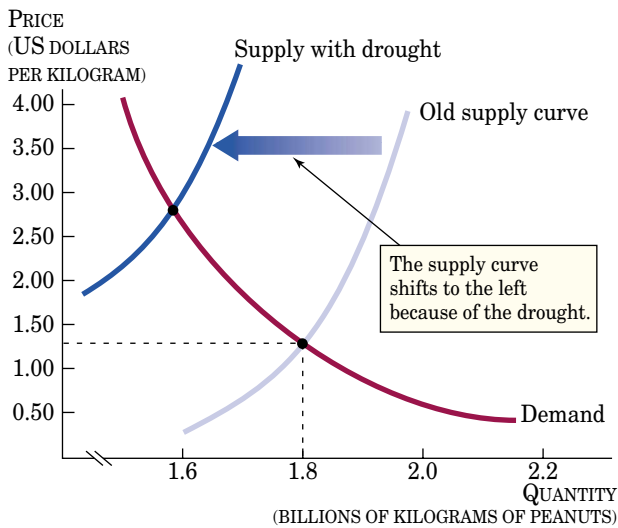
**FIGURE 3A.1**  
*Supply and demand for peanuts*

The quantity refers to the number of kilograms produced in the United States. The price is the average price of raw peanuts in the United States.

#### Drought in the south-eastern US States

During 1990, there was a drought in the south-eastern part of the United States, where most of the peanuts are grown. The drought meant that supply declined. Production dropped sharply in Georgia, Alabama and Florida. In the supply and demand model, we would show that drought by a shift to the left in the supply curve for peanuts, as shown in figure 3A.2.

As you can see in figure 3A.2, the equilibrium price rises. In fact, the price of peanuts in the drought of 1990 did rise from about US\$1.30 a kilogram to about US\$2.75 a kilogram. Thus, the supply and demand model can explain the rise in the peanut price.



**FIGURE 3A.2**

**Effects of a drought in the south-eastern US States**

The drought reduces the supply of peanuts. Hence, the supply curve shifts to the left, raising the equilibrium price of peanuts and lowering the equilibrium quantity. The supply and demand model explains the observed increase in the price of peanuts.

Quite understandably, this price rise forced some hard choices on people who consume a lot of peanuts. In the United States low-income people tend to eat more peanut butter than high-income people, so the price change affected the distribution of income. Further, the US Department of Agriculture (USDA) school lunch program that provides meals for disadvantaged children in the United States had to stop buying peanut butter because it got so expensive.

Thus, the price performed its three roles. The higher price lowered the quantity demanded by providing incentives for people to choose some other food. It transmitted information about the effects of the drought in the south-eastern States all over the country. It also affected the distribution of income because people who buy peanuts and peanut butter had less to spend on other things.

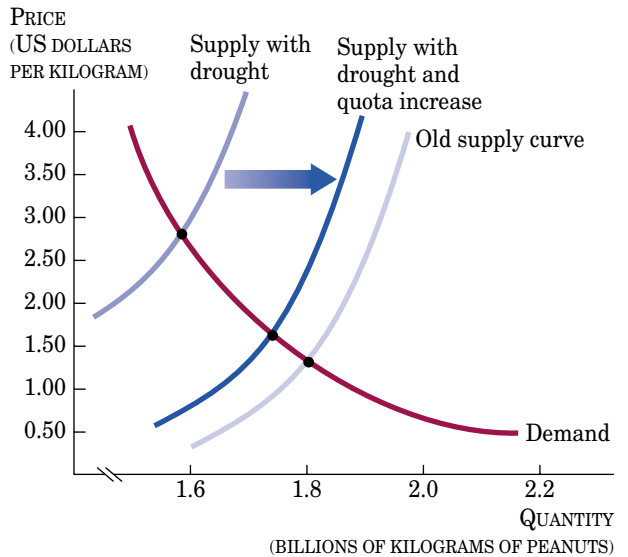
**A change in the foreign peanut quota?**

Although the market responded to the drought as predicted, the higher price made life difficult for some consumers. Was there anything to be done? Could the supply and demand model help in deciding what to do? Could it predict what would happen under various courses of action?

Surprisingly, the US government prohibits virtually any imports of peanuts into the United States from other countries. There is a law limiting the amount of imported peanuts to a small quantity: about 0.8 million kilograms, compared to the nearly 1.8 billion kilograms consumed. This limit is called a quota. The United States allows only about a quarter of 1 per cent of its peanut consumption to come from foreign countries.

One simple way to lower the price would be to allow more foreign peanuts to come into the United States from Argentina, China and other peanut-growing countries. In fact, the supply and demand model predicts that the price would fall if the quota was increased.

Allowing more foreign peanuts into the United States would shift the supply curve of peanuts to the right, as shown in figure 3A.3. That would lower the equilibrium price. For the size of the rightward shift in the diagram, the price would go down to about US\$1.65 a kilogram, which would have helped the peanut consumers who were being hurt by the drought.



**FIGURE 3A.3**

**Predicted effects of an increase in the peanut quota**

The supply and demand model can also be used to predict what would happen if more peanuts were allowed to enter the United States from abroad. The increase in supply would shift the supply curve to the right. The equilibrium price of peanuts would fall. Hence, the model predicts that increasing the quota would tend to offset the effects of the drought on the price of peanuts.

However, that is not what happened in 1990. The United States has a formal process to determine whether or not more foreign peanuts can be brought into the country. A committee, the International Trade Commission (ITC), decides whether the peanut farmers might be harmed by the lower price caused by such foreign peanuts. In 1990 it took many months for the ITC to make the decision. A majority of the commissioners determined that peanut farmers would not be affected a great deal if the US government allowed more peanuts in. Economists who work for the ITC used a supply and demand model just like the one in figure 3A.3 to analyse the situation and make a recommendation to increase the quota. But others, including the peanut growers and some members of Congress, claimed there was no reason to increase the quota. They argued that the demand for peanuts had decreased after the drought and that an increase in the supply of foreign peanuts was unnecessary. One peanut growers' group was quoted as saying, 'Demand for peanut butter and peanut products will be less this year because the USDA has drastically reduced its purchases of

peanut products' (*Peanuts*, US International Trade Commission Publication 2369, March 1991, p. A-70).

To an economist, this statement confuses shifts of the demand curve and movements along the demand curve. As shown in figure 3A.2, the drought led to a movement along the demand curve because higher peanut prices forced people to reduce the quantity demanded. But this was not a decline in demand. Rather, consumers reduced the quantity demanded because the price was so high.

These debates led to delays. By the time the quota increase came, in July 1991, it was too little and too late. Ultimately, only about seven million kilograms of peanuts were imported. The supply and demand model predicts that such a small increase in supply will reduce the price only a small amount. Although the ultimate result may have been disappointing, the 1990 drought and peanut quota increase provide an excellent case study of how the supply and demand model is used in practice both to explain observations about prices and to make useful predictions about prices.