3. MARKET DEMAND AND SUPPLY

LEARNING OBJECTIVE

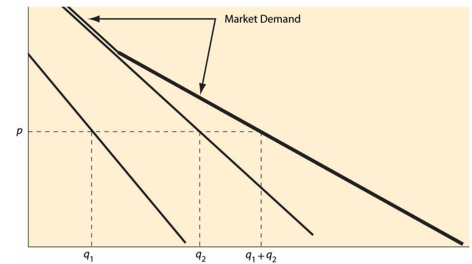
1. **How are individual demands and supplies aggregated to create a market?**

Individuals with their own supply or demand trade in a market, where prices are determined. Markets can be specific or virtual locations—the farmers' market, the New York Stock Exchange, eBay—or may

be an informal or more amorphous market, such as the market for restaurant meals in Billings, Montana, or the market for roof repair in Schenectady, New York.

Individual demand gives the quantity purchased for each price. Analogously, the **market demand** gives the quantity purchased by all the market participants—the sum of the individual demands—for each price. This is sometimes called a "horizontal sum" because the summation is over the quantities for each price. An example is illustrated in Figure 3.1. For a given price p, the quantity q_1 demanded by one consumer and the quantity q_2 demanded by a second consumer are illustrated. The sum of these quantities represents the market demand if the market has just those two participants. Since the consumer with subscript 2 has a positive quantity demanded for high prices, while the consumer with subscript 1 does not, the market demand coincides with consumer two's demand when the price is sufficiently high. As the price falls, consumer one begins purchasing, and the market quantity demanded is larger than either individual participant's quantity, and is the sum of the two quantities.

FIGURE 3.1 Market demand



Example: If the demand of buyer one is given by $q = \max\{0, 10 - p\}$, and the demand of buyer two is given by $q = \max\{0, 20 - 4p\}$, what is market demand for the two participants?

Solution: First, note that buyer one buys zero at a price of 10 or higher, while buyer two buys zero at a price of 5 or higher. For a price above 10, market demand is zero. For a price between 5 and 10, market demand is buyer one's demand, or $10 - p$. Finally, for a price between zero and 5, the market quantity demanded is $10 - p + 20 - 4p = 30 - 5p$.

Market demand

The quantity purchased by all market participants for each price.

Market supply is similarly constructed—the market supply is the horizontal (quantity) sum of all the individual supply curves. Example: If the supply of firm one is given by $q = 2p$, and the supply of firm two is given by $q = \max\{0, 5p - 10\}$, what is market supply for the two participants?

Solution: First, note that firm one is in the market at any price, but firm two is in the market only if price exceeds 2. Thus, for a price between zero and 2, market supply is firm one's supply, or $2p$. For $p > 2$, market supply is $5p - 10 + 2p = 7p - 10$.

Market supply

The sum of all the individual supply curves for all market participants.

KEY TAKEAWAYS

- The market demand gives the quantity purchased by all the market participants—the sum of the individual demands—for each price. This is sometimes called a "horizontal sum" because the summation is over the quantities for each price.
- The market supply is the horizontal (quantity) sum of all the individual supply curves.