Veterinary Economics

The willingness to sell creates supply

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During a trip to Africa years ago, I received the following bit of advice from a missionary I met there: "When you go to the market, don't haggle with the vendors; just pay them what they ask, because they really need the money." Although he was well intentioned, I found his suggestion to be problematic. As I had learned in my youth at the local sale barn, both buyers and sellers want to know they got the best deal they could. Sellers want to know that the items they have sold could not have been sold for 1 penny more, and buyers want to know that the items they have bought could not have been purchased for 1 penny less. For a buyer to pay the initial asking price leaves the seller thinking he or she could have asked for more. For a seller to accept the first offer leaves the buyer thinking he or she could have offered less. In economics, a market is considered efficient when the willingness to sell just equals the willingness to buy.

For any given product or service, the amount that producers and firms are willing to sell at any given price (with all other factors being held constant) is defined as market supply, and it is this relationship between price and quantity that defines the supply function (or supply curve). The supply function is similar to the demand function, but the relationship between price and quantity demanded is usually negative (ie, as price increases, the quantity demanded decreases), whereas the relationship between price and quantity supplied is usually positive (ie, as price increases, the quantity supplied increases). The percentage change in quantity supplied divided by the percentage change in price defines the price elasticity of supply.

Factors Affecting Supply

Just as multiple factors other than price can affect the quantity of a product or service demanded, multiple factors other than price can affect the quantity of a product or service supplied or, in other words, a seller's willingness to sell. Some of the factors that affect supply include the underlying production function, the price of inputs, the price of related goods, and the impact of exogenous factors such as taxes and subsidies. A factor that affects individual suppliers will affect the shape of the supply curve, whereas a factor that affects all suppliers will lead to a shift in the supply curve.

What determines the price at which veterinarians

are willing to sell their goods and services? Answering this question depends first on determining the specific inputs—in what combination and what proportion—that are required to produce the outputs to be sold. This relationship between the inputs required and the outputs produced defines what economists call a production function. For example, in veterinary education, the outputs produced by veterinary colleges are new veterinary degrees (representing a bundle of veterinary knowledge). The inputs required to produce those new degrees include faculty and staff, facilities and equipment, supplies, utilities, and management. Specific quantities of these inputs in a specific combination are necessary to provide a single student with a veterinary education, and as the quantity of inputs is increased, the number of students that can be trained also increases. Similarly, in clinical practice, the inputs required to produce veterinary services include a veterinarian, veterinary hospital facility, and equipment. The capacity to provide a given service depends on the availability of each specific input.

Every seller should know what price he or she must receive to stay in business. In the simplest terms, the price must be such that it covers the cost of the inputs plus a reasonable economic return (ie, profit). The production function provides the physical relationship between inputs and outputs. The application of cost to those inputs converts the production function into a supply function, which describes the economic relationship between costs and outputs.

Economies of Size

Importantly, although the supply function for a firm relates costs to outputs, this is not, in most instances, a strict linear relationship. For example, imagine a school consisting of 8 faculty members and a single classroom that can fit up to 30 students. The total cost of the faculty members and classroom remains the same regardless of whether there is 1 student or 30, so for each additional student up to 30, the mean cost per student decreases. When the cost per unit of output decreases as the number of output units increases, the business is said to have achieved an economies of size. In this instance, because the decrease in cost per unit of output would have been due to the technical relationship between inputs and outputs, the change would be referred to as a technical economies of size.

Economies of size can arise from 2 other sources as businesses grow. Technology may increase labor productivity or provide services that were not previously

available. But, obtaining new technology often involves high initial costs. Thus, businesses will have to see substantial increases either in labor productivity or in the sale of new services associated with the technology to generate the revenue needed to pay for the costs of the technology and generate a profit. Firms that are too small to generate the necessary revenues will not be able to afford new technology, whereas larger firms can take advantage of economies of size. In this case, economies of size mean that larger business—whether schools or practices—are typically better able to acquire new technology because they can spread those costs across a larger number of goods and services (eg, students or surgeries).

Finally, some costs are not fixed, but vary with the number of goods or services provided. In clinical practice, for example, the total cost of disposable materials (eg, syringes, catheters, sutures, and gloves) increases as the number of spays increases. Even here, larger business can take advantage of economies of size because the more materials the practice buys, the lower the per unit cost of the materials. This ability to lower costs by purchasing large quantities is termed pecuniary economies of size.

Economies of size tend to push businesses to grow larger because the lower costs per unit as the business grows and expands its output create a competitive advantage. The lower costs per unit will affect the price the business is willing to accept.

Supply and the Willingness to Sell

Consider a market with many firms. Some of these firms will have grown to the point where they have reached the minimum obtainable cost per unit, whereas others will have not. Each of these firms will be willing to sell at the cost required to produce their output plus a reasonable economic return (profit). At a low price offered by buyers, some firms will be willing to sell, but as the price offered rises, more firms with higher costs of production will start to be willing to sell also.

The supply function is formed by all of the possible prices offered by buyers and the corresponding quantities that producers are willing to sell at that price. As the price rises, higher quantities will be supplied; as the price falls, lower quantities will be supplied. Overall, the quantity offered increases as price rises for 2 reasons. First, firms with higher production costs will now find it profitable to sell. Second, firms with lower production costs may expand production beyond their minimum cost output point because, with a higher price, they can still maintain their previous profit margin.

Of course, this example holds only when the firms are all producing the same product and the only differentiating characteristic is price. If products from different firms can be differentiated on the basis of quality, brand, location, or some other factor that adds value to consumers, then firms with higher production costs may be able to charge higher prices.

Conclusion

The supply curve describes the relationship between the price of a good or service and the quantity sellers are willing and able to supply at that price. Movements along the supply curve represent a change in the quantity that sellers are willing to supply as the price offered by buyers changes. On the other hand, shifts in the supply curve represent industry-wide changes that affect the cost of producing that good or service. To date, there has been no published research on estimates of supply functions for the veterinary services market, the market for veterinarians, or the veterinary education market.

Initial results of the AVMA's study of the price elasticities of demand for specific veterinary services will be presented during the Second Annual AVMA Economic Summit in Chicago, October 28, 2014.