

# Chapter 2

## Demand

### **CHAPTER SUMMARY**

A demand curve shows the quantity demanded as a function of price, other things equal. Generally, the demand curve slopes downward. Changes in price are represented by movements along the demand curve, while changes in other factors, such as income, the prices of related products, and advertising, are represented by shifts of the entire demand curve. The market demand curve is the horizontal summation of the individual demand curves of the various buyers.

For a normal (inferior) product, demand is positively (negatively) related to changes in buyer's income. Two products are complements (substitutes) if an increase in the price of one causes a fall (an increase) in the demand for the other. Buyer surplus is the difference between a buyer's total benefit from some quantity of purchases and his or her actual expenditures. Changes in price affect buyer surplus through the price changes themselves as well as through changes in the quantity demanded.

Package deals consist of a fixed quantity of the item for a fixed payment. Two-part tariffs consist of a fixed payment and a charge based on usage. These are two ways by which sellers can extract surplus from buyers.

### **KEY CONCEPTS**

|                         |                      |                 |
|-------------------------|----------------------|-----------------|
| individual demand curve | complement           | total benefit   |
| marginal benefit        | substitute           | buyer surplus   |
| normal product          | market demand curve  | two-part tariff |
| inferior product        | horizontal summation |                 |

### **GENERAL CHAPTER OBJECTIVES**

1. Describe a demand curve and distinguish an individual and market demand curve.
2. Illustrate how the demand curve can be used to: (a) show the quantity demanded at a particular price, and (b) the price the buyer(s) are willing to pay for a particular quantity.

3. Describe the relationship between the slope of a demand curve and marginal benefit.
4. Distinguish between a change in quantity demanded versus a change in demand in words, as well as how each is reflected graphically.
5. Interpret and graphically reflect an increase and a decrease in demand and describe some of the most common variables that can cause an increase and a decrease in demand. In particular, distinguish complements from substitutes.
6. Construct a market demand curve from individual demand curves.
7. Describe the role of income distribution in affecting the demand for products.
8. Describe buyer surplus and express it graphically.
9. Describe the concepts of package deals and two-part tariffs, and show graphically how sellers can use these schemes to extract buyer surplus.
10. Relate the concept of consumer demand to business demand for inputs and describe some of the factors of business demand.

## **NOTES**

1. **Consumer demand: Individual demand curve.**
  - (a) a graph showing the quantity (horizontal axis)(e.g., no. of movies watched per month) that one buyer is willing and able to purchase at every possible price (vertical axis)(e.g., ticket price per movie).
  - (b) by showing the maximum price the buyer is willing and able to pay to get each unit (or a particular quantity) of the item, the individual demand curve helps a seller to determine the maximum that a buyer is willing to pay for any specified quantity.
  - (c) demand is dependent on time.
  - (d) *Principle of diminishing marginal benefit.*
    - i. Marginal benefit – the (psychic or monetary) benefit provided by an *additional* unit of the item.
    - ii. The principle of diminishing marginal benefit - each additional unit of consumption or usage provides less benefit than the proceeding unit. Accordingly, the price that an individual is willing to pay will decrease with the quantity purchased.
    - iii. Diminishing marginal benefit gives rise to a *downward* sloping marginal benefit curve and an identical *downward* sloping demand curve: the lower the price, the larger the quantity demanded.
  - (e) The procedure for constructing a demand curve relies completely on the consumer's individual *preferences* and this has two implications:
    - i. the demand curve will change with changes in the consumer's preferences, and
    - ii. different consumers may have different preferences and hence different demand curves.

**2. Changes in income or other factors vis a vis a change in price on individual demand.**

- (a) A change in the price of an item (holding income and all other factors unchanged) generally causes *movement* along an individual demand curve (a change in the *quantity demanded*)
- (b) A change in income or other factors (e.g., the prices of related products, advertising, season, weather, and location) (other than the price of an item) causes an entire *shift* of the individual demand curve (a change in *demand at all price levels*).
- (c) Income changes.
  - i. A change in income will affect individual demand at all price levels.
  - ii. Normal products – demand increases as buyer’s income increases, and demand falls as buyer’s income falls. When the economy is growing and income are rising, demand for normal products will rise and demand for inferior products will fall. The demand for normal products is relatively higher in richer countries
  - iii. Inferior products – demand is negatively related to buyer’s income. Demand increases as buyer’s income decreases, and demand falls as buyer’s income increases. In a recession where incomes are falling, demand for normal products will fall and demand for inferior products will rise. The demand for inferior products is relatively higher in poorer countries
  - iv. Broad categories (e.g., movies, transportation, consumer products) tend to be normal, while particular products within the categories (e.g., matinees, public transport, black and white TVs) may be inferior.
  - v. Distinction between normal and inferior products is important for business strategy and international business.
- (d) Prices of related products.
  - i. Complements – two products are complements if an increase in the price of one causes a fall in the demand for the other; e.g., popcorn and movies.
  - ii. Substitutes - an increase in the price of one causes an increase in the demand for the other; e.g., video rentals.
  - iii. In general, when there is an increase in the price of a complement or a fall in the price of a substitute, the demand curve shifts to the right.
- (e) Advertising.
  - i. Advertising may be informative as well as persuasive.
  - ii. An increase in advertising expenditure generally increases individual demand.
  - iii. The effect of advertising expenditure on demand may be subject to diminishing marginal product - each additional dollar spent on advertising has a relatively smaller effect on demand.
- (f) Note: Three factors (in addition to price, income, the prices of complements and substitutes, and advertising) are particularly significant in the individual demand for consumer durables (e.g., automobiles, home appliances, and machinery):

expectations about future prices and incomes, interest rates, and the prices of used models.

**3. Consumer demand: Market demand curve.**

- (a) A graph showing the quantity that *all* buyers will purchase at every possible price. It is the horizontal summation of the individual demand curves.
- (b) It enables businesses to understand the entire market rather than individual customers.
- (c) All consumers get diminishing marginal benefit: the individual demand curve slopes downward, the market demand curve also slopes downward. At a lower price, the market as a whole will buy a larger quantity.

**4 Changes in income or other factors vis a vis a change in price on market demand.**

- (a) A change in the price of an item (holding income and all other factors unchanged) generally causes *movement* along the market demand curve from one point to another on the same curve.
- (b) A change in income or other factors (e.g., the prices of related products, advertising) (other than the price of an item) causes a *shift* of the entire market demand curve.
- (c) The directions of the effects of changes in income and other factors on market demand are similar to those for individual demand.
- (d) Comparing market demands in different countries.
  - i. two ways of measuring the income of an entire country: the gross national product ( $GNP = GDP + \text{income from foreign sources}$ ) and the gross domestic product ( $GDP = \text{total value of production}$ ).
  - ii. common shortcut in estimating demand: by estimating the demand for an individual with average income (dividing the GNP or GDP by population) and multiply that by the number of buyers.
  - iii. however, the more *uneven* the distribution of income within a market, the more important it is to consider the *actual* distribution of income and *not* merely the average income.

**5 Market Structure.**

- (a) The concept of an individual demand curve has two possible meanings: the individual demand curve of a buyer or the individual demand curve faced by a seller (as market demand divides into the demands facing individual sellers).
- (b) The quantity demanded for a firm's production depends on the selling price, buyers' incomes, the prices of related products, and other factors.

**6 Buyer surplus.**

- (a) As the individual demand curve shows the quantity that one buyer is willing and able to purchase at every possible price, *a seller can calculate the maximum price* that the buyer can be charged for a given purchase.
- (b) Benefit.
- i. Marginal benefit - the benefit provided by an additional unit of an item, measured by the maximum amount that the buyer is willing to pay for that unit.
  - ii. Total benefit - the benefit yielded by all the units that the buyer purchases, i.e., the marginal benefit from the first up to and including the last unit purchased. Graphically this is the area under the buyer's demand curve up to and including the last unit purchased. This is *the maximum* that the buyer is willing to pay for that quantity, this is also the maximum price that a seller can charge.
- (c) **Individual buyer surplus.**
- i. the difference between an individual buyer's total benefit from some quantity of purchases and her or his actual expenditure.
  - ii. Graphically reflected by the area under the demand curve and above the price.
  - iii. Price reduction leads to increase in buyer's surplus: first, a lower price on the quantity that the buyer would have purchased at the original higher price; and second, as the buyer buys more (depending on the buyer's response to the price reduction), she gains buyer surplus on each of the additional purchases.
  - iv. The buyer loses from a price increase: a higher price and a reduction in the quantity purchased.
  - v. A seller can extract buyer surplus by the following:
    - (1) Package deal
    - (2) Two-part tariff – a pricing scheme consisting of a fixed payment and a charge based on usage (e.g., telephone monthly charge coupled with an airtime charge).
- (d) **Market** buyer surplus - the sum of the individual buyer surpluses. Analysis similar to that of individual buyer surplus.

## 7 Business demand.

- (a) Consumer vis a vis business demand.
- i. Some items are purchased only by businesses (as inputs for the production of other goods and services for sale to consumers or other businesses), e.g., TV commercials, human resources.
  - ii. Some items are purchased by both consumers (for final consumption) and businesses, e.g., gasoline and telephone calls.
  - iii. The inputs purchased by a business can be classified into raw materials, energy, labor, and capital, which may be substitutes or complements.

- (b) The principles of business demand are similar to those underlying consumer demand.
- (c) *diminishing marginal benefit*.
  - i. A business can measure its marginal benefit from an input as the increase in revenue arising from an additional unit of the input, and will be subject to *diminishing marginal benefit*.
  - ii. The demand curve for an input by a business slopes downward due to the diminishing marginal benefit from the input.
  - iii. Business demand is derived from calculations of marginal benefit. A business should buy an input up to the quantity that its marginal benefit from the input exactly balances the price.
- (d) A change in the price of an input is represented by a *movement* along the demand curve.
- (e) Changes in other factors will lead to a *shift* of the entire demand curve
  - i. A major factor in consumer demand is income. Business demand does not depend on income but rather on the quantity of the output.
  - ii. The demand for an input also depends on the prices of complements and substitutes in the production of the output.
  - iii. on the whole, purchasing decisions of businesses are relatively less subject to impulse buying than those of consumers---hence advertising plays a smaller role in business demand, and there is relatively more informative than persuasive advertising.

### **ANSWERS TO PROGRESS CHECKS**

- 2A. The theater must cut prices by \$5 from \$7.50 to \$2.50.
- 2B. (1) It slopes downward because of diminishing marginal benefit. (2) The drop in the consumer's income will cause the demand curve to shift to the left if black-and-white TVs are a normal product, but cause the demand curve to shift to the right if black-and-white TVs are an inferior product.
- 2C. Video rentals are a substitute for movies. A fall in the price of video rentals will cause the demand curve for movies to shift to the left.
- 2D. An increase in the price of a complement would cause the market demand to shift to the left.
- 2E. If the price of movies is \$5, Joy's buyer surplus would be the area *dcb*.

- 2F. It can increase its profits by reducing its purchases of labor to 1000 worker-hours.

**ANSWERS TO REVIEW QUESTIONS**

3. Introduction of the new diaphragm will:  
(a) Reduce the demand for male condoms.  
(b) Reduce the demand for birth control pills.
4. Newspapers and free-to-the-air broadcast television are substitutes for cable television service. The controls limited competition for illegal cable television services and so boosted their demand.
5. Mobile and fixed-line telephone services are complements to the extent that subscribers of one service may call subscribers of the other. Mobile and fixed-line telephone services are substitutes to the extent that a user may subscribe to mobile service in place of fixed-line telephone service.
6. Pepsi advertising will increase the demand for the soft drink.
7. (a) The demand for Marriott rooms will increase. (b) Assuming that Motel 6 rooms are an inferior product, the demand for Motel 6 rooms will decrease.
8. Mont Blanc fountain pens are a luxury item and more sensitive to income distribution.
9. (a), (b), and (c).
10. The carrier should set the price so that the consumer has no buyer surplus.
11. [omitted]
12. [omitted]
13. Consumer demand depends on income, while demand for inputs depends on the output quantity. Consumer demand is relatively more sensitive to advertising than business demand.
14. Banks install ATMs to substitute equipment for labor, and hence save on wages. It is relatively more profitable to make this substitution in countries where labor is expensive.

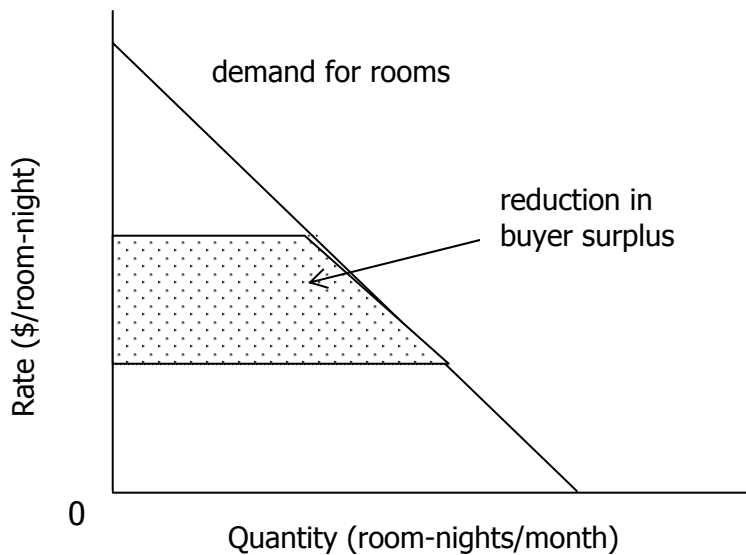
15. Ships are durable, and the demand for new ships depends on the prices of secondhand vessels and interest rates.

**WORKED ANSWER TO DISCUSSION QUESTION**

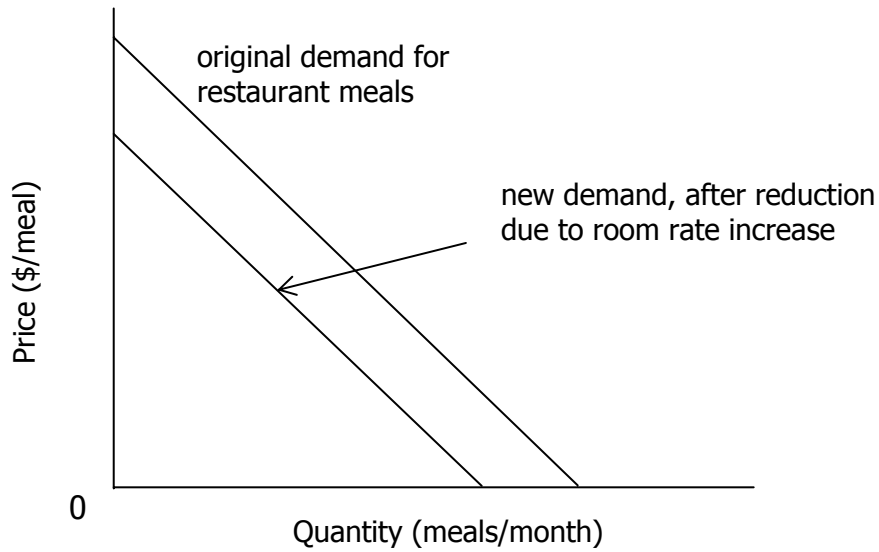
Venus Hotel has two major sources of revenue – room rental and food and beverage sales. Recently, Venus raised its room rates. The hotel’s occupancy rate (percentage of rooms rented) fell. Room service and restaurant sales also dropped.

- a. Draw a demand curve for rooms at Venus.
- b. How did the increase in room rates affect the buyer surplus of Venus’s customers?
- c. Draw a demand curve for meals at Venus’s restaurant.
- d. How did the increase in room rates affect the demand for restaurant meals?

Answer:







- (a) Demand for rooms: see above.
- (b) Reduction in buyer surplus: shaded area in figure above.
- (c) Demand for meals: see above.
- (d) Reduction in demand: see demand shift in figure above. Restaurant meals are a complement to rooms. Hence, the increase in room rates caused the demand for meals to shift to the left.