SIXTH EDITION

ASHGATE

Air Transportation

A Management Perspective

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PRICING AND DEMAND

Of all the marketing variables that influence the potential sales of airline seats and cargo capacity, price has received the most attention since deregulation. For over 200 years, economists have emphasized the price variable in describing the level of demand for products and services. Pricing remains a very complex issue in many industries. In the case of air transportation, it is even more complex because of the transition in recent years from a highly regulated industry to a deregulated environment.

Economists have developed a simple yet elegant model of how to set a price. The model has the properties of logical consistency and optimization, but it represents a severe oversimplification of the pricing problem as it exists in practice. There is value, however, in examining the model, because it provides some fundamental insights into the pricing problem and because its very limitations help bring out the complex issues involved in pricing.

Demand is defined as the various amounts of a product or service that consumers are willing and able to purchase at various prices over a particular time period. A demand schedule is simply a representation of a series of possibilities that can be set down in tabular form. Table 10-2 is a hypothetical demand schedule for a particular air carrier route. This tabular portrayal of demand reflects the relationship between the price or fare and the estimated number of passengers who would be willing and able to purchase a ticket at each of these prices.

A fundamental characteristic of demand is that as price falls, the corresponding quantity demanded rises; alternatively, as price increases, the corresponding quantity demanded falls. In short, there is an inverse relationship between price and quantity demanded. Economists have labeled this inverse relationship the **law of demand.** Upon what foundation does this law or principle rest? Basically, common sense and simple observation. People ordinarily will fly more at lower prices than at higher prices. To passengers, high price is an obstacle that deters them from buying. The higher this price obstacle, the less they will buy; the lower the price obstacle, the more they will buy. Passengers will drive instead of fly; businesspeople will turn to telephone conference calls and the like as fares rise.

This inverse relationship between price and number of passengers purchasing tickets can be presented on a simple two-dimensional graph measuring estimated number of passengers on the horizontal axis and price on the vertical axis (see Figure 10-1). The resulting curve is called a demand curve. It slopes downward and to the right because the relationship it portrays between price and estimated number of passengers ticketed is inverse. The law of demand—people buy more at a low price than they do at a high

TABLE 10-2 **An Individual Air Carrier's Demand for Air Transportation per Month Between Two Cities (hypothetical data)**

Price	Estimated Number of Passengers
$75	1,000
70	1,150
65	1,275
60	1,400
55	1,550

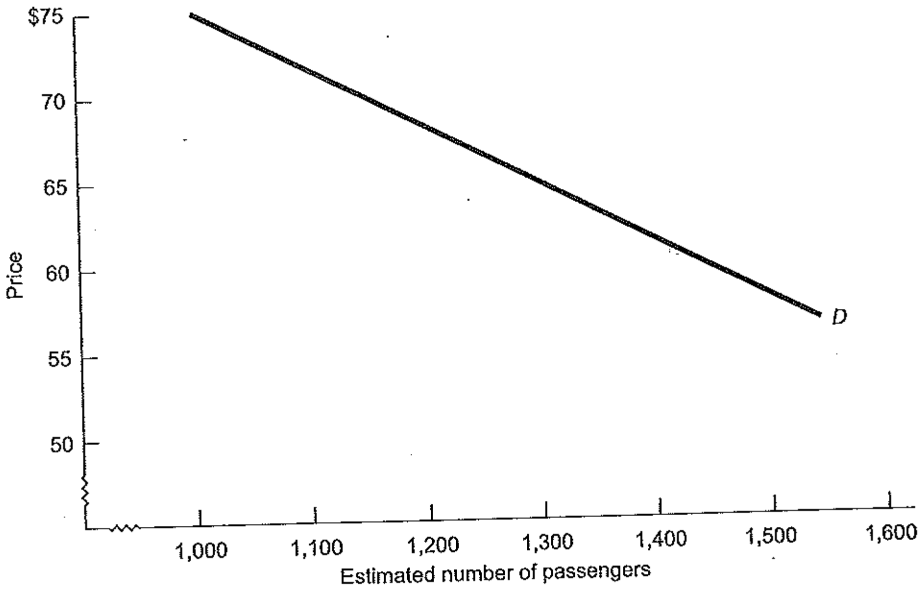

FIGURE 10-1 **An individual air carrier's demand for air transportation per month between two cities (hypothetical data).**

price—is reflected in the downward slope of the demand curve. What is the advantage of graphing our demand schedule? It permits us to represent clearly a given relationship—in this case, the relationship between price and estimated number of passengers—in a simpler way than we could if we were forced to rely on verbal and tabular presentation.

Determinants of Demand

In constructing a demand curve, a forecaster assumes that price is the most important determinant of the amount of any product or service purchased. But the forecaster is aware that factors other than price can and do affect purchases, in our case, of tickets. Thus, in drawing a demand schedule or curve, the forecaster must also assume that other factors remain constant; that is, the nonprice determinants of the amount demanded are conveniently assumed to be given. When these nonprice determinants of demand do in fact change, the location of the demand curve will shift to some new position to the right or left of its original position (see Figure 10-2).

The major nonprice determinants of demand in the air travel market are (1) the preferences of passengers, (2) the number of passengers in a particular market, (3) the financial status and income levels of the passengers, (4) the prices of competitors and related travel expenses, and (5) passenger expectations with respect to future prices.

Changes in Demand

What happens if one or more of the determinants of demand should change? It will change the demand schedule data and therefore the location of the demand curve. Such a change in the demand schedule data, or, graphically, a shift in the location of the demand curve,

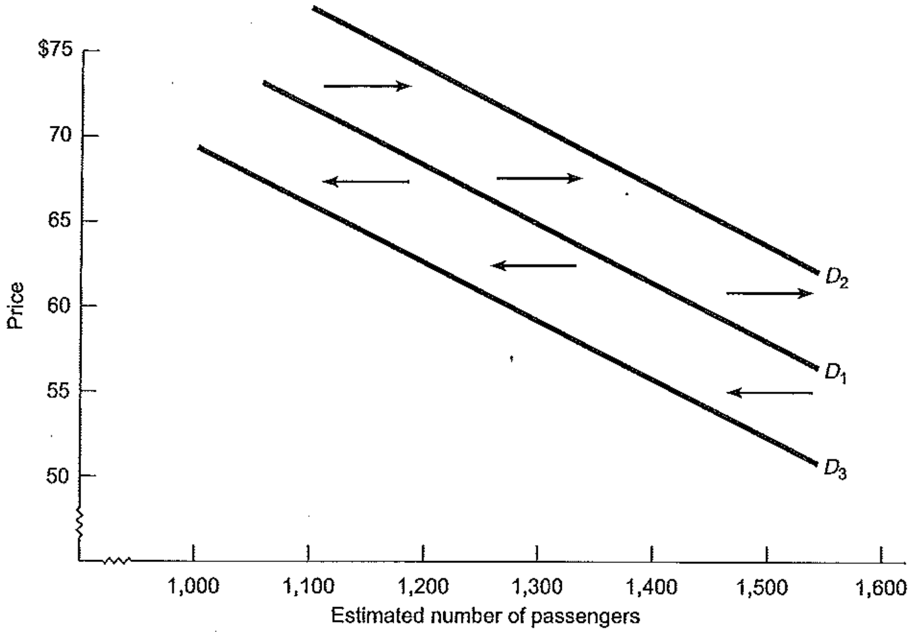

FIGURE 10-2 Effect of changes in demand.

is called a *shift in demand.* For example, if passengers become willing and able to buy more tickets, at each possible price over a particular time period we have an increase in demand. An increase in demand is reflected in a shift of the demand curve to the right, for example, from D_1 to D_2, as shown in Figure 10-2. Conversely, a decrease in demand occurs when, because of a change in one or more of the determinants, consumers buy fewer tickets at each possible price than was forecast. Graphically, a decrease in demand entails a shift of the demand curve to the left, for example, from D_1 to D_3, as shown in Figure 10-2.

Let us now examine the effect on demand of changes in each of the aforementioned nonprice determinants, using the same hypothetical example.

1. *Preferences of passengers.* A change in passenger preferences favorable to an airline—possibly prompted by advertising—will mean that more tickets will be demanded at each price over a particular time period, shifting the curve to the right. An unfavorable change in passenger preferences will cause demand to decrease, shifting the curve to the left. The airline sells fewer tickets than forecast at all prices offered during that time period. Preferences can include a number of factors, including an airline's image (United's "friendly skies," Delta's "professionalism"), perceived safety record, on-time reliability, in-flight and ground services afforded, gate position, type of aircraft flown, frequency of departure, and many more either real or perceived differences that relate to a passenger's preference for one airline over another.

2. *Number of passengers.* An increase in the number of passengers in a market—brought about perhaps by improvements in connecting flights or by population growth—will

constitute an increase in demand. Fewer potential passengers will be reflected by a decrease in demand.

3. *Financial status and income levels of passengers.* This nonprice determinant relates to the state of the economy and the level of such things as personal income, disposable income, and profits (in the case of businesses). Air transportation is very sensitive to fluctuations in the economy. If the economy is in a recessionary period, with higher than normal unemployment and decreased factory orders, both business and pleasure travelers will be flying less. Conversely, when the economy is booming, businesspeople are traveling extensively and workers are not hesitant to make air travel plans.

4. *Prices of competitors and related travel expenses.* An increase in a competitor's price, all other things being equal, will normally prompt some passengers to switch to your airline. The reverse is also true: if you raise your prices and your competitor doesn't, all other things being equal, you will lose some business. An increase in the competitor's price will normally shift your demand curve to the right, and, assuming your prices hold and your competitor's prices drop, your demand curve will shift to the left. Economists refer to these as substitute or competing goods.

   There are other related travel expenses that complement one another. For example, if motel and rental car rates are falling and these items make up 70 percent of the proposed expenses for a trip, the air fare price on a particular trip may be insignificant, relatively speaking. Thus, if a planned $1,000 vacation is unexpectedly obtainable through a package costing $550, the fact that the airfare went from $150 to $165, a 10 percent increase, becomes insignificant.

5. *Passengers' expectations with respect to future prices.* Passengers' expectations of higher future prices may prompt them to buy now in order to beat the anticipated price rises. Conversely, expectations of falling prices will tend to decrease the current demand for tickets.

A *change in demand* should not be confused with a *change in the quantity demanded.* A change in demand is a shift in the entire demand curve, either to the right (an increase in demand) or to the left (a decrease in demand). The passenger's state of mind concerning a ticket purchase has been altered because of a change in one or more of the determinants of demand. As used by forecasters, the term *demand* refers to a schedule or curve; therefore, a change in demand must mean that the entire schedule has changed or that the curve has shifted its position. In contrast, a change in the quantity demanded is the movement from one point to another point—from one price–quantity combination to another—on a fixed demand curve. The cause of a change in the quantity demanded is a change in the price of the ticket under consideration.

Decide whether a change in demand or a change in the quantity demanded is involved in each of the following illustrations:

1. Airline B lowers its price on a particular flight, with the result that Airline A, with a flight departing 15 minutes later, loses passengers.

2. Airline C lowers its price on a particular route segment and experiences an increase in the number of passengers carried.

3. Passengers' incomes rise as a result of a turnaround in the economy, resulting in more vacation traveling.

Elasticity of Demand

The law of demand tells us that consumers will respond to a price decline by buying more of a product or service. But consumers' degree of responsiveness to a price change may vary considerably. Economists, forecasters, and airline price analysts measure how responsive, or sensitive, passengers are to a change in the price by **elasticity of demand.** The demand for some air travel is such that passengers and shippers are relatively responsive to price changes; price changes give rise to considerable changes in the number of passengers carried. This is called **elastic demand.** For other air travel, passengers are relatively unresponsive to price changes; that is, price changes result in modest changes in the number of additional passengers motivated to fly. This is known as **inelastic demand.**

Pricing analysts and others measure the degree of elasticity or inelasticity by the elasticity coefficient, or E_d, in this formula (Δ = change):

$$E_d = \frac{\text{Percentage change in passenger demand}}{\text{Percentage change in price}} = \frac{\%\Delta Q}{\%\Delta P}$$

One calculates these percentage changes by dividing the change in price by the midpoint between the prices and the change in passenger demand by the midpoint between the demands. Thus, we can restate our formula as

$$E_d = \frac{\text{Change in passenger demand}}{\text{Midpoint between passenger demands}} \div \frac{\text{Change in price}}{\text{Midpoint between prices}}$$

We use the midpoints to determine percentage changes to avoid the discrepancy that would occur if we went from one price, say \$100, to \$120, which would result in a 20 percent increase changing from \$100 to \$120, but a 16 percent decrease changing from \$120 to \$100. By using the midpoint, \$110, and dividing it into the change, we arrive at a compromise percentage change of 18 percent whether we go from \$100 to \$120 or \$120 to \$100. Similarly, if the original number of passengers carried at a price of \$100 was 220, and 180 passengers were carried at a price of \$120, the percentage change using the midpoint would be 20 percent.

Now let us interpret our formula.

Elastic Demand. Demand is elastic if a given percentage change in price results in a larger percentage change in passengers carried. For example, demand is elastic if a 7 percent decrease in price results in a 12 percent increase in the number of passengers carried or if a 4 percent increase in price results in a 10 percent decrease in the number of passengers. In all such cases, where demand is elastic, the elasticity coefficient will obviously be greater than 1. Another way of determining the elasticity is to see what happens to total revenue as a result of the price change. If demand is elastic, a decline

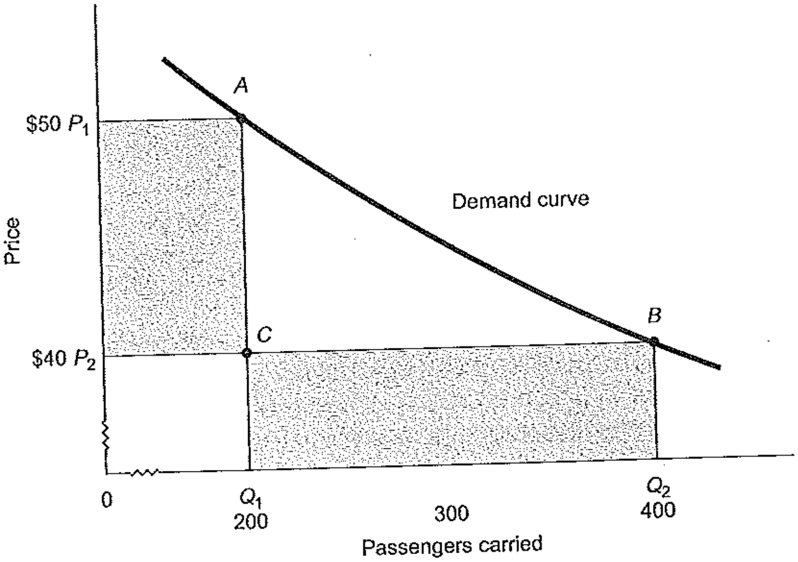

FIGURE 10-3 **Elastic demand. When demand is elastic, a decrease in price results in an *increase* in total revenue, and an increase in price results in a *decrease* in total revenue.**

in price will result in an increase in total revenue, because even though the price per passenger is lower, enough additional passengers are now being carried to more than make up for the lower price. This is illustrated in Figure 10-3.

Total revenue is price times quantity. Thus, the area shown by the rectangle $0P_1AQ_1$, where $P_1 = \$50$ and quantity demanded $Q_1 = 200$ passengers carried, equates with total revenues of $10,000. When price declines to P_2 ($40), causing the quantity demanded to increase to Q_2 (400 passengers carried), total revenue changes to $0P_2BQ_2$ ($16,000), which is obviously larger than $0P_1AQ_1$. It is larger because the loss in revenue caused by the lower price per unit (P_2P_1AC) is less than the gain in revenue caused by the larger sale in dollars (Q_1CBQ_2) that accompanies the lower price. The reasoning is reversible: if demand is elastic, a price increase will reduce total revenue, because the gain in total revenue caused by the higher unit price (P_2P_1AC) is less than the loss in revenue associated with the accompanying fall in sales (Q_1CBQ_2). That is, if demand is elastic, a change in price will cause total revenue to change in the opposite direction. Figure 10-4 may be helpful in remembering this rule.

	Price	Quantity	Total revenue
$\% \Delta Q > \% \Delta P$ (percentage change in Q is greater than percentage change in P)	↓ ↑	↑ ↓	↑ ↓

FIGURE 10-4 **Basic rule of elastic demand.**

Obviously, when airlines reduce prices, they anticipate that consumers will be responsive (elastic). In other words, they assume that the price drop will be more than offset by a larger percentage increase in consumers, thereby filling seats and cargo capacity and increasing total revenues. If they raise prices and consumers are responsive (elastic), the rise in price will be offset by a larger percentage decrease in consumers, and total revenues will fall.

Inelastic Demand. Demand is inelastic if a given percentage change in price is accompanied by a relatively smaller change in the number of passengers carried. For example, if a 10 percent decrease in price results in a 5 percent increase in the number of passengers carried, demand is inelastic. If an 8 percent increase in fares results in a 3 percent decrease in the number of passengers, demand is inelastic. It is apparent that the elasticity coefficient will always be less than 1 when demand is inelastic. If demand is inelastic, a price decline will cause total revenue to fall. The modest increase in sales that will occur will be insufficient to offset the decline in revenue per passenger, and the net result will be a decline in total revenues. This situation exists for the $70–80 price range shown on the demand curve in Figure 10-5.

Initially, total revenue is $0P_1AQ_1$ = $24,000, where price P_1 = $80 and the number of passengers carried $Q_1 = 300$. If we reduce the price to P_2 ($70), the passengers carried will increase to Q_2 (325). Total revenue will change to $0P_2BQ_2$ ($22,750), which is less than $0P_1AQ_1$. It is smaller because the loss in revenue caused by the lower fare (area P_2P_1AC) is larger than the gain in revenue caused by the accompanying increase in sales (area Q_1CBQ_2). Again, our analysis is reversible: if demand is inelastic, a price increase will increase

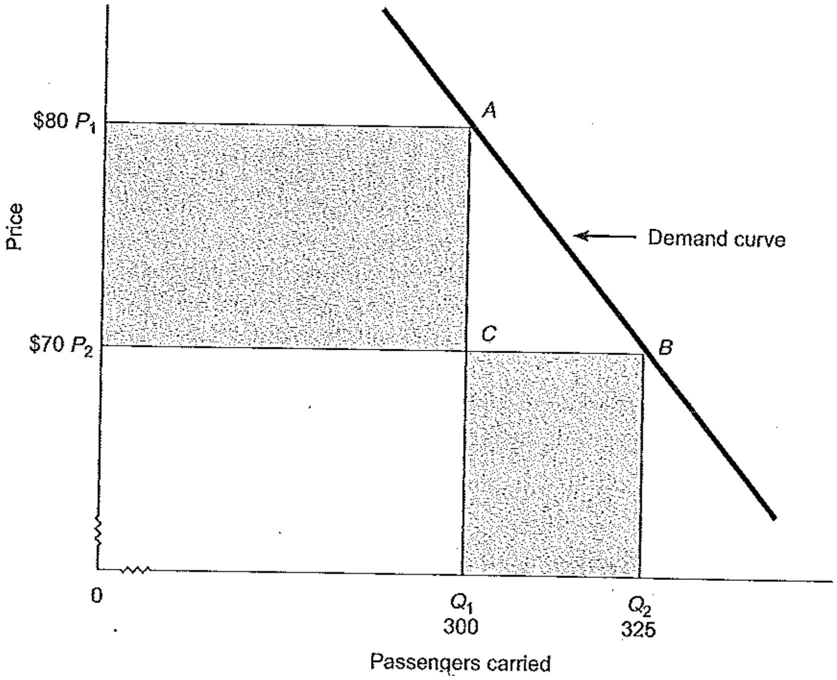

FIGURE 10-5 **Inelastic demand. When demand is inelastic, a decrease in price results in a *decrease* in total revenue, and an increase in price results in an *increase* in total revenue.**

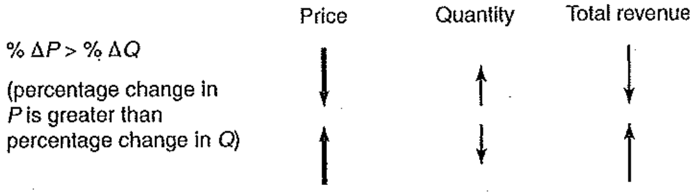

FIGURE 10-6 Basic rule of inelastic demand.

total revenue. That is, if demand is inelastic, a change in price will cause total revenue to change in the same direction. Figure 10-6 may be helpful in remembering the rule.

The borderline case that separates elastic and inelastic demand occurs when a percentage change in price and the accompanying percentage change in number of passengers carried are equal. For example, a 5 percent drop in price causes a 5 percent increase in the number of tickets sold. This special case is termed *unit elasticity*, because the elasticity coefficient is exactly 1, or unity. In this case, there would be no change in total revenue.

Determinants of Elasticity

Competition. Generally speaking, the more competition there is (the more substitutes and alternatives), the more responsive (elastic) consumers will be. For example, if four carriers are operating flights within 15 minutes of one another to a particular city and one offers a lower fare, a passenger likely will fly with that carrier, all other things being equal.

Distance. Long-haul flights tend to be more elastic than short-haul flights. Thus, vacationers will be responsive to a fare reduction of $100 on a $500 fare even if they have to leave between Tuesday and Thursday. Short-haul fare changes tend to be inelastic. A 10 percent increase on a $30 fare is only $3. A carrier will generally not experience a 10 percent or greater decrease in passengers for such a small amount.

Business Versus Pleasure. Business fliers tend to be less responsive to price changes than vacationers or individuals on personal trips. Why? Most businesspeople are on expense accounts and have to make their trips within a certain period of time. Nor are they generally willing to take a late-night flight to take advantage of a discount. Vacationers can arrange their schedules and be much more elastic (responsive) to price changes if it is worth it to them.

Time. Certainly, if we have time, we can be much more responsive to price changes than if we do not. On the other hand, if we have little time and must be at a certain place at a particular time, we generally will be very inelastic with regard to price changes. For example, fares to Los Angeles may be going up by 20 percent next week, but if niece Kellie is getting married there next month, we cannot be responsive by flying out there now to save the extra 20 percent.

Cost-Cutting Trends

Leading up to the early 2000s, airlines commenced application of cost-cutting measures to reduce rising operational costs. Many of the world's airlines had huge deficits that were further increased after the 2001 terrorist attacks in the United States, putting many airlines over the edge. Huge losses forced airlines to implement additional cost-cutting strategies basically overnight.

In the short term, airlines furloughed or laid off employees, with some carriers rehiring employees on a part-time basis. Aircraft fleet sizes were reduced, having a negative impact on frequency. To compensate for reduced frequency, some airlines used larger aircraft on selected routes. Airlines operating on traditional hub-and-spoke systems reduced or eliminated service to selected destinations. Alliances between air carriers were increased, resulting in increased market share and cross-utilization of resources. In some cases, airlines merged or filed for bankruptcy protection. For example, in late 2002, US Airways filed for bankruptcy with the hope of restructuring and reemerging as a successful carrier. Since 9/11, in addition to US Airways, United, Delta and Northwest have filed for bankruptcy. As of early 2006, US Airways and United have reemerged. American Airlines, the largest carrier in the world at the time, made an announcement saying that filing for bankruptcy was just a matter of time if the industry did not pick up. Fortunately, for American, the airline has not filed for bankruptcy as of early 2006.

The trends briefly discussed are expected to continue for the foreseeable future. To remain afloat, airlines are being forced to cut pennies wherever reasonably possible while maximizing revenue. For the major airlines, downsizing is a difficult process and, in some cases, next to impossible. However, opportunities are created for smaller airlines, especially those in the low-cost sector.

PRICING AND OUTPUT DETERMINATION

Pricing and output determination for airlines is as much an art as a science. There is no simple or, for that matter, singular way to approach the analysis. We will start our analysis by reviewing the demand side of the picture. As noted previously, the demand curve facing any airline slopes downward and represents an inverse relationship between price and passengers carried: the lower the price, the greater the amount of passenger traffic generated. In addition, passengers are responsive to price changes. At first, they may be very responsive (elastic) to price reductions, and that might stimulate a large percentage change in passengers carried. Unfortunately, at some point, further price cuts will not stimulate additional traffic in sufficient numbers to offset the reduction in total revenue caused by the price cut. In other words, passengers will become unresponsive (inelastic). Columns 1 and 2 in Table 10-3 portray this situation. We assume in this particular instance that our hypothetical airline must accept a price cut in order to generate additional **revenue passenger miles (RPMs)**. A revenue passenger mile is one passenger transported one mile in revenue service. Our fare in this case is expressed in dollars per mile, commonly referred to as *yield.* Yield is actually defined as the air transport revenue per unit of traffic carried, or total passenger revenue per RPM. Basically, it is the same as price, average revenue (AR), or fare per mile. Column 3 represents the total revenue for each level of RPMs generated during this particular period. Column 4 shows the marginal, or extra, revenue that results from additional RPMs. The data in Table 10-3 are shown graphically in Figures 10-8 and 10-9.

TABLE 10-3 **Demand and Revenue Schedule for an Airline over a Particular Period of Time (hypothetical data)**

Yield (price or AR) per Mile	RPMs (millions)	Total Revenue (thousands)	Marginal Revenue (thousands)
$0.265	0.800	$212.0	$119.5
0.260	1.275	331.5	132.6
0.255	1.820	464.1	88.4
0.250	2.210	552.5	35.5
0.245	2.400	588.0	6.0
0.240	2.475	594.0	-6.5
0.235	2.500	587.5	-9.0
0.230	2.515	578.5	-11.5
0.225	2.520	567.0	-12.2
0.220	2.522	554.8	

Total Costs in the Short Run

Now let's turn our attention back to the cost side of the picture. The costs an airline incurs in producing available seat-miles (ASMs) depend on the types of adjustments it is able to make in the amounts of the various resources it employs. The quantities of many resources used—labor, fuel, and so forth—can be varied relatively quickly in the short run. But the amounts of other resources demand more time for adjustment. For example, acquiring new aircraft or building new hangars can be varied only over a considerable period of time. The *short-term period* refers to a period of time too brief to permit the airline to alter its capacity yet long enough to permit a change in the level at which the existing fleet of aircraft is utilized. An airline's overall capacity is fixed in the short run, but ASMs can be varied by applying larger or smaller amounts of labor, materials, and other resources to that capacity. In other words, the existing fleet can be used more or less intensively in the short run. Through better scheduling and more efficient use of labor, the airline can increase ASMs in the short run, but there is a limit.

As the airline adds resources to a fixed capacity, its output (ASMs) might increase at an increasing rate for a while if it had been underutilizing its existing capacity. However, beyond some point, ASMs would increase at a *decreasing* rate until ultimate capacity in the short run was reached. This economic principle is called the **law of diminishing returns.**

Table 10-4 illustrates the law of diminishing returns numerically. ASMs increase at an increasing rate up to 2.6 and then continue to increase at a decreasing rate up to capacity in the short run. Column 3 shows that the total variable costs associated with each level of ASMs flown are not constant. As ASMs increase, variable costs actually increase at a *decreasing* rate from 1.7 to 2.6 million ASMs. Eventually, variable costs increase at an *increasing* rate. The reason for this behavior of variable costs lies in the law of diminishing returns. The total cost shown in column 4 is self-defining: it is the sum of fixed and variable costs at each level of ASMs. Figure 10-10 shows graphically the fixed, variable, and total costs presented in Table 10-4.

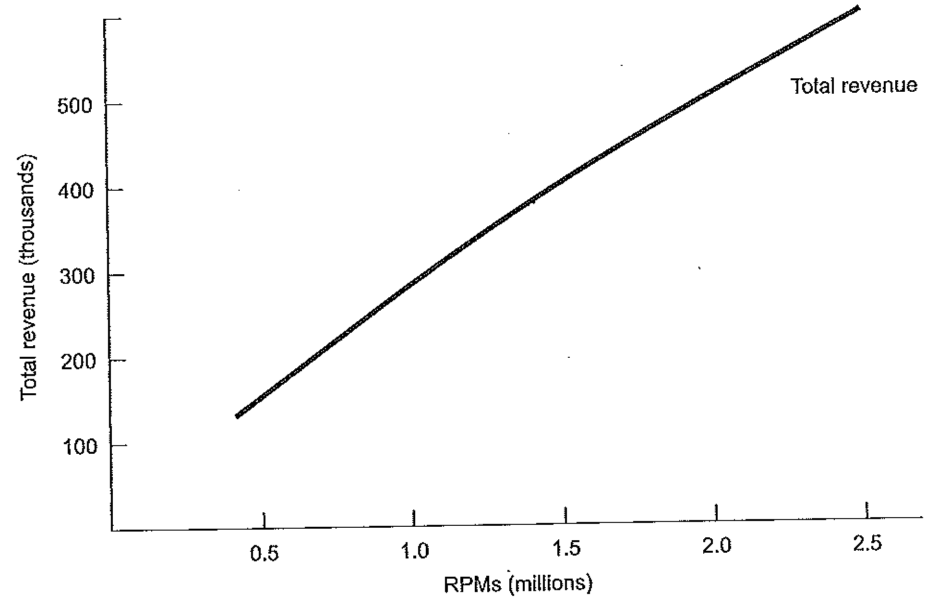

FIGURE 10-8 Total revenue and RPMs for an individual airline over a particular period of time (hypothetical data).

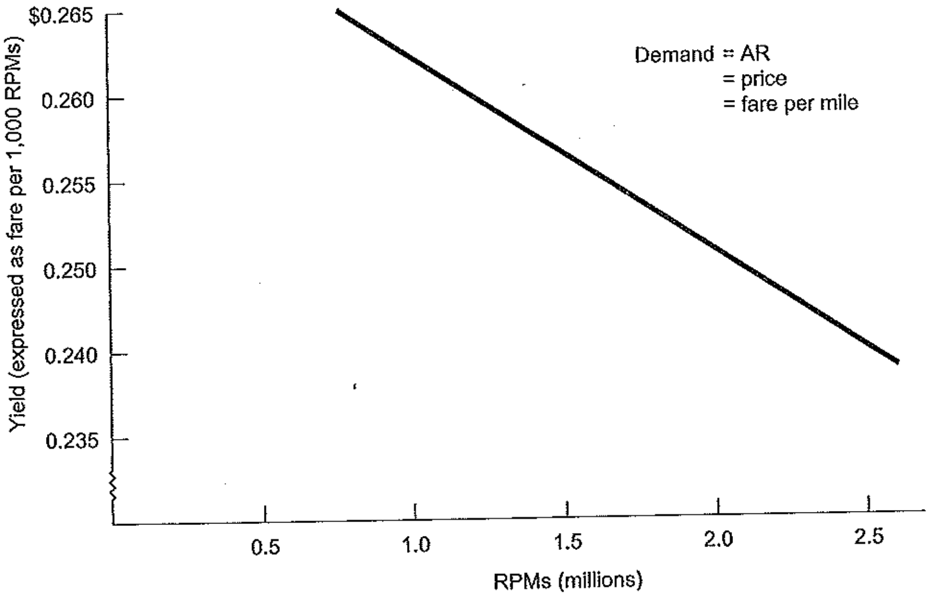

FIGURE 10-9 Yield expressed in fare per 1,000 RPMs for an individual airline over a particular period of time (hypothetical data).

TABLE 10-4 **Total Fixed-Overhead Costs, Total Variable Costs, and Total Costs for an Airline over a Particular Period of Time (hypothetical data)**

ASMs (millions)	Total Fixed Cost (thousands)	Total Variable Cost (thousands)	Total Cost (thousands)	Marginal Cost (thousands)
1.0	$100	$160	$ 260	
1.7	100	170	270	$ 10
2.6	100	240	340	70
3.4	100	300	400	60
4.0	100	370	470	70
4.5	100	450	550	80
4.9	100	540	640	90
5.2	100	650	750	110
5.4	100	780	880	130
5.5	100	930	1030	150

Load Factor

One more piece is needed before we can complete our pricing analysis. In Chapter 6, *passenger load factor* was defined as revenue passenger miles divided by available seat-miles. In developing a demand schedule, a pricing analyst assumes that all of the ASMs produced by the airline company will not be filled by RPMs.-(This was discussed in detail in Chapter 6.) Consequently, it is reasonable to assume that a carrier will not experience a 100 percent load factor on all routes or on all flights, during the period of time for which the analyst has made the price and RPM forecast. For purposes of analysis, it is assumed that the load factors shown in Table 10-5 are associated with the ASMs and RPMs previously shown.

Load factors normally increase with reductions in ASMs, because the carrier would cut back on those flights and routes that have experienced the lowest load factors and poorest profits. Those remaining would be the ones that have experienced the highest load factors and greatest profits—hence, the higher overall average.

As a practical matter, the analyst also realizes that systemwide load factors above 75 percent or below 55 percent are not realistic. To maintain an average of 75 percent is quite an achievement, considering the number of flights and passengers it would take at 90 percent or above to offset the low load factors experienced during off-peak hours and resulting from flights made to position aircraft into large hubs for the morning or afternoon bank of flights. Load factors below 55 percent would also not be practical because profit would not be realized.

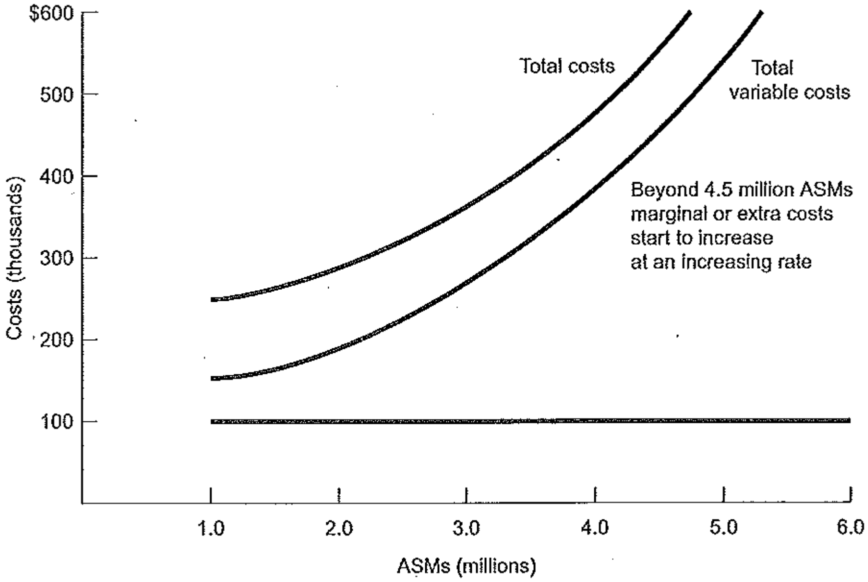

FIGURE 10-10 **Total costs and ASMs for an individual airline over a short period of time (hypothetical data).**

TABLE 10-5 **Systemwide Passenger Load Factor for an Airline over a Particular Period of Time (hypothetical data)**

Load Factor		
ASMs (millions)	*RPMs (millions)*	Estimated System Load Factor
1.0	0.800	80%
1.7	1.275	75
2.6	1.820	70
3.4	2.210	65
4.0	2.400	60
4.5	2.475	55
4.9	2.500	51
5.2	2.515	48
5.4	2.520	47
5.5	2.522	46

Profit Maximization in the Short Run

Given prices, RPMs, total revenues, total costs, and load factors, the airline is faced with the question of what level of ASMs will maximize profits or, at worst, minimize losses. Table 10-6 includes the data from both tables 10-3 and 10-4, plus the profit (+) or loss (-) at each level of output. Assuming that this is a profit-maximizing airline, it should produce 3.4 million ASMs, which will generate 2.21 million RPMs at a price or average revenue (yield) of $0.250 per mile and a total revenue of $552,500. The load factor at this level of output will be an acceptable 65 percent. The 3.4 million ASMs will cost this airline $400,000 to produce, and the airline will experience profits of $152,500. If the airline were more concerned with holding its market share in certain markets by increasing scheduled flights and decreasing load factors to a systemwide level of 55 percent, it could still experience profits of $44,000. Beyond 4.5 million ASMs, it is not generating enough traffic (passengers have become unresponsive to further price reductions) to offset the costs associated with this level of output.

Figure 10-11 compares total revenue and total cost graphically. This airline's profits are maximized at the level of output (3.4 million ASMs and 2.21 million RPMs) at which total revenue exceeds total cost by the maximum amount. Unfortunately, if the RPMs shown in Figure 10-11 do not materialize and if demand decreases at all price levels over this particular time period, revenues will fall, squeezing the profit area shown in the diagram. If prices are in the inelastic range (in other words, if passengers are unresponsive to further price reductions), the only choice for the airline is to reduce capacity (cut back ASMs). In so doing, it will reduce variable and total costs, improve load factors, and, it is hoped, maintain profitability.

TABLE 10-6 **Profit-Maximizing Output for an Airline over a Particular Period of Time (hypothetical data)**

ASMs (millions)	Yield (price or AR) per Mile	RPMs (millions)	Total Revenue (thousands)	Total Fixed Cost (thousands)	Total Variable Cost (thousands)	Total Cost (thousands)	Profit (+) or Loss (–) (thousands)
1.0	$0.265	0.800	$212.0	$100.0	$160.0	$ 260.0	$ –48.0
1.7	0.260	1.275	331.5	100.0	170.0	270.0	+61.5
2.6	0.255	1.820	464.1	100.0	240.0	340.0	+124.1
3.4	0.250	2.210	552.5	100.0	300.0	400.0	+152.5
4.0	0.245	2.400	588.0	100.0	370.0	470.0	+118.0
4.5	0.240	2.475	594.0	100.0	450.0	550.0	+44.0
4.9	0.235	2.500	587.5	100.0	540.0	640.0	–52.5
5.2	0.230	2.515	578.5	100.0	650.0	750.0	–171.5
5.4	0.225	2.520	567.0	100.0	780.0	880.0	–313.0
5.5	0.220	2.522	554.8	100.0	930.0	1030.0	–475.2

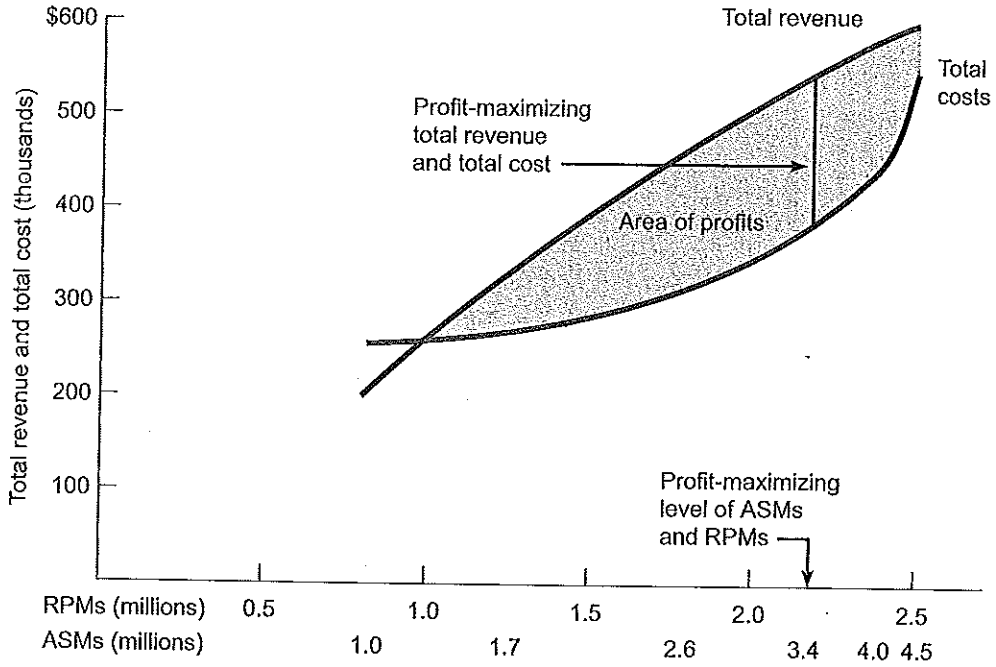

FIGURE 10-11 **Total revenue and total costs for an individual airline over a short period of time (hypothetical data).**

KEY TERMS

demand
law of demand
elasticity of demand
elastic demand
inelastic demand
normal fares
common fares
joint fares
promotional fares
Airline Tariff Publishing Company (ATPCO)
inventory management
direct operating costs
block speed
indirect operating costs
nonoperating costs and revenues
variable costs
available seat-miles (ASMs)
fixed costs
revenue passenger miles (RPMs)
law of diminishing returns

REVIEW QUESTIONS

1. What was the primary reason for the changes in average air passenger fares between 1929 and 1941, 1950 and 1953, 1960 and 1970, 1973 and 1986, 1987, 2001 and the present?

2. Explain the law of demand as it relates to air travel. What are the nonprice determinants of air travel demand? What happens to the demand curve when each of these