



Worksheet - Elasticity

Related news article: [Why airlines like extra fees so much?](#) (Forbes, March 11, 2023)

Summary: This worksheet could be used for in-class or homework practice. Students will be asked to read a short article about the reasons why airlines unbundle ticket prices, i.e., charge fees for checking luggage, choosing a seat, or having a meal separately from the base fare. Then, students will be asked to compare the price elasticity of demand for plane tickets and checked bags, as well as for different types of passengers. Students will also be encouraged to analyze how the total revenue airlines collect from base fare and ancillaries varies as prices change. The worksheet will also ask students to apply the midpoint formula to calculate the price elasticity of demand, and to apply the supply and demand model to explain fare changes based on seasonality. **Answers are provided at the end of this document.**

Learning objectives:

At the end of this worksheet, students will be able to:

- o Distinguish between elastic and inelastic demand;
- o Analyze whether the total revenue of an airline increases or decreases when fares change;
- o Compare passengers to determine who has a relatively more elastic demand for plane tickets;
- o Analyze whether the demand for plane tickets or checked luggage is more price elastic;
- o Apply the midpoint formula to calculate the price elasticity of demand;
- o Compare scenarios to recognize analogies;
- o Apply the supply and demand model to explain “higher fares at busy times”;
- o Evaluate the effect of extra fees for checked luggage or an agent’s assistance on the costs of airlines.

Economics concepts: Price elasticity of demand, Revenue, Costs, Incentives, Supply and demand model

Suggested excerpts:

“Fees for checking bags, picking your seat, getting something to eat, or in some cases using a live agent to check in. People hate airline fees, yet they continue to grow in both volume and price. Global airlines collect over 20% of their total revenue from fees, called ancillary revenue...”

“As airlines have collected more ancillary revenue, not only with fees but from many sources, base fares for travelers have dropped. This gives more people the ability to travel by air, even if they must give up a few things to make that happen. What happens most times, though, is people attracted by the low entry price end up buying something else, like a checked bag.”

“Airline passengers are highly elastic.”

“...by building ancillary revenue streams, airlines can grow the base of passengers by making the entry point less expensive.”

“Airlines are a very seasonal business. There is variability of demand based on time of year, and even by day of week. Weekly airline demand is not evenly spread over seven days, with many more people traveling per day on Thursday-Friday than Monday-Wednesday. Balancing this seasonality is a challenge for airlines, as their capacity is often largely fixed.”

“Base fares often adjust for this seasonality, with higher fares at busy times and incentivizing lower fares at weaker demand times. This results in big variations in monthly and quarterly revenue.”

“Airline fees not only raise airline revenue. They also act as incentives for consumers to behave differently, and these differences often result in lower costs for the airline. When airlines charge for bags rather than bundle these into the base fare like Southwest, customers check fewer bags. This means bag belts last longer, airlines lose fewer bags, and maybe they don't need as many people to load and unload the bags. RyanAir in Europe, and a few airlines in the U.S., charge a fee to check in with an agent, while checking in on a smartphone is free and easy. As fewer people need a person for check in, airlines can both hire fewer agents over time and lease less space from the airport.”

Questions

1. According to the article, the revenue airlines collect from fees for “checking bags, picking your seat, getting something to eat” that are not included in the base fare is called:
 - a. Total revenue.
 - b. Extra revenue.
 - c. Implicit revenue.
 - d. Ancillary revenue.

2. The article states that “airline passengers are highly elastic.” What does this mean?
 - a. A small decline in an airline’s revenue results in a relatively large decline in the number of workers this airline hires.
 - b. A small decline in the fare results in a relatively large decline in an airline’s revenue.
 - c. A small decline in the fare results in a relatively large increase in the quantity demanded for plane tickets.
 - d. A small decline in the number of passengers results in a relatively large decline in this airline’s profit.

3. Suppose that Southwest reduces the fare from Tampa, FL to Washington, DC. Assume also that the demand for plane tickets between the initial and the new price is elastic. What is expected to happen to the total revenue Southwest collects?
 - a. Total revenue increases.
 - b. Total revenue decreases.
 - c. Total revenue does not change.
 - d. It cannot be determined.

4. Which of the following passengers has the most price elastic demand for a plane ticket to Italy?
 - a. A family looking for a place to go on a vacation in Europe.
 - b. A CEO who has a scheduled meeting with another CEO in Italy.
 - c. A university professor who has to present at a conference in Italy.
 - d. A family who is going to the wedding of a close relative in Italy.

5. The article states that low-cost airlines “may enter a market that used to carry 350 people every day, and by lowering the base fare a bit the market grows to 500 people a day.”

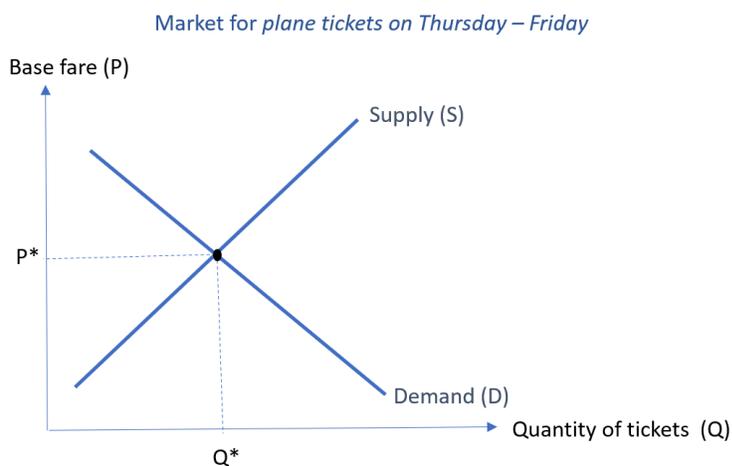
Suppose that this happens to an airline that decreases the fare by 10%. Use the midpoint formula to calculate the percentage change in the number of passengers (i.e., the percentage change in the quantity demanded) per day. What is the price elasticity of demand?

6. The article explains that “different products react differently to price changes. A family may decide whether to fly at all, or where to go, based on only \$5-\$10 difference in fare. But once they’ve committed to the trip, a bag charge of \$25 or \$35 results in almost no difference in the number of bags checked. If you are thirsty and bored, a dollar either way isn’t likely to change how many drinks are sold.” Based on this information, is the demand for airplane tickets or the demand for checked bags more price elastic?

7. The article describes how airlines unbundle ticket prices to “better reflect the price elasticity of each product,” “consumer demand and willingness to pay,” and ultimately raise their revenue. Which of the following scenarios resembles the fore-mentioned situation the most?

- a. A restaurant does not include drinks and desserts with the main entree.
- b. A bakery always serves its apple pie with vanilla ice-cream on top.
- c. A chain of hotels has a loyalty program whose members are entitled to one free night after three hotel stays (3 nights).
- d. The tickets for two theme parks in Orlando, FL are always sold as a bundle.

8. The demand for airplane tickets varies based on the day of the week. According to the article “many more people traveling [travel] per day on Thursday-Friday than Monday-Wednesday.” Use the supply and demand model to explain the “higher fares at busy times.” Show the effect on the following graph to justify your answer.



9. The article explains that “airlines are a very seasonal business” and demand varies “based on time of year, and even by day of week.” Additionally, “while ticket prices may change

by hundreds of dollars based on season, baggage and other fees stay largely stable throughout the year.” Based on this information, does an airline’s revenue from base fare, or the revenue from ancillaries change more depending on the season?

10. Airline fees that are not included in the base fare lower the costs for airlines by providing incentives for passengers to behave differently, e.g., passengers check fewer bags. The European airline Ryan Air also “charge[s] a fee to check in with an agent, while checking in on a smartphone is free and easy.” In your own words, why charging a separate fee for checking bags and a fee for checking in with an agent might reduce the costs for airlines?

Answer Key

1. According to the article, the revenue airlines collect from fees for “checking bags, picking your seat, getting something to eat” that are not included in the base fare is called:
- Total revenue.
 - Extra revenue.
 - Implicit revenue.
 - Ancillary revenue.

Answer: D.

2. The article states that “airline passengers are highly elastic.” What does this mean?
- A small decline in an airline’s revenue results in a relatively large decline in the number of workers this airline hires.
 - A small decline in the fare results in a relatively large decline in an airline’s revenue.
 - A small decline in the fare results in a relatively large increase in the quantity demanded for plane tickets.
 - A small decline in the number of passengers results in a relatively large decline in this airline’s profit.

Answer: C.

3. Suppose that Southwest reduces the fare from Tampa, FL to Washington, DC. Assume also that the demand for plane tickets between the initial and the new price is elastic. What is expected to happen to the total revenue Southwest collects?
- Total revenue increases.
 - Total revenue decreases.
 - Total revenue does not change.
 - It cannot be determined.

Answer: A. If the price decreases, the quantity demanded will increase. Given that the demand is elastic between the initial and the new price, the quantity demanded will increase by a larger percentage than the percentage change in the price. Therefore, the total revenue (i.e., price*quantity) is expected to increase.

4. Which of the following passengers has the most price elastic demand for a plane ticket to Italy?
- A family looking for a place to go on a vacation in Europe.
 - A CEO who has a scheduled meeting with another CEO in Italy.
 - A university professor who has to present at a conference in Italy.
 - A family who is going to the wedding of a close relative in Italy.

Answer: A. The meeting of the CEO, the presentation of the professor, and the wedding are all in Italy on fixed days, so the travelers will not be very flexible even if the fares change. They have to be in Italy at the fixed time of the events they are attending. In contrast, the family looking for a place to go on a vacation could choose a different destination (e.g., Spain, Greece, or another country) the tickets for which are cheaper and/or a different time to travel when fares are lower.

5. The article states that low-cost airlines “may enter a market that used to carry 350 people every day, and by lowering the base fare a bit the market grows to 500 people a day.” Suppose that this happens to an airline that decreases the fare by 10%. Use the midpoint formula to calculate the percentage change in the number of passengers (i.e., the percentage change in the quantity demanded) per day. What is the price elasticity of demand?

Answer: According to the midpoint formula, the % change in the quantity demanded is $\{(500 - 350)/[(500 + 350)/2]\} * 100\% = (150/425) * 100\% = 0.353 * 100\% = 35.3\%$. The price elasticity of demand is the % change in the quantity demanded divided by the % change in the price, or $35.3\% / (-10\%) = -3.53$, i.e., the demand is elastic.

6. The article explains that “different products react differently to price changes. A family may decide whether to fly at all, or where to go, based on only \$5-\$10 difference in fare. But once they’ve committed to the trip, a bag charge of \$25 or \$35 results in almost no difference in the number of bags checked. If you are thirsty and bored, a dollar either way isn’t likely to change how many drinks are sold.” Based on this information, is the demand for airplane tickets or the demand for checked bags more price elastic?

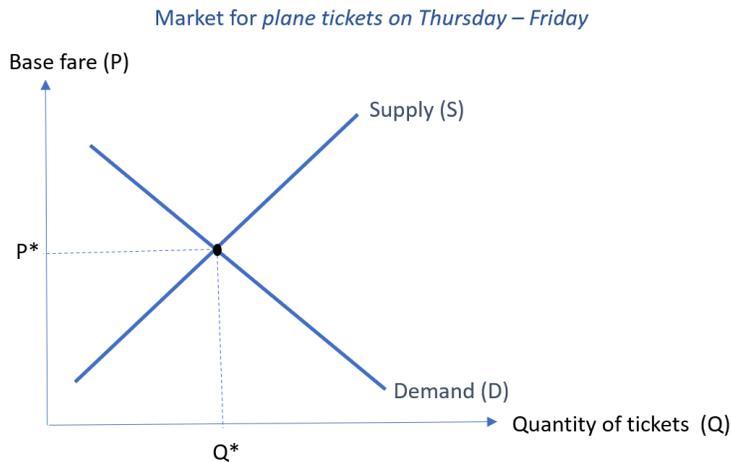
Answer: As the article suggests, compared to the change in the number of passengers when fares change, the number of checked bags is less likely to change when the fee to check in a bag changes. This implies that the demand for checked bags is more inelastic (less elastic) than the demand for airplane tickets, i.e., the demand for plane tickets is more elastic than the demand for checked bags.

7. The article describes how airlines unbundle ticket prices to “better reflect the price elasticity of each product,” “consumer demand and willingness to pay,” and ultimately raise their revenue. Which of the following scenarios resembles the fore-mentioned situation the most?

- a. A restaurant does not include drinks and desserts with the main entree.
- b. A bakery always serves its apple pie with vanilla ice-cream on top.
- c. A chain of hotels has a loyalty program whose members are entitled to one free night after three hotel stays (3 nights).
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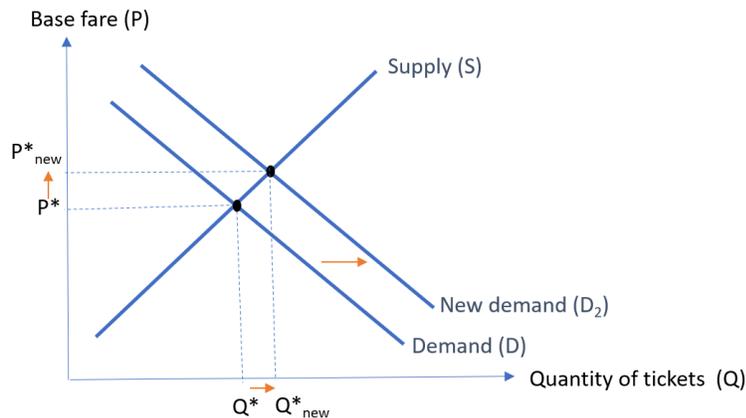
Answer: A.

8. The demand for airplane tickets varies based on the day of the week. According to the article “many more people traveling [travel] per day on Thursday-Friday than Monday-Wednesday.” Use the supply and demand model to explain the “higher fares at busy times.” Show the effect on the following graph to justify your answer.



Answer: The demand for plane tickets increases on Thursday and Friday. Graphically, the demand curve shifts to the right. This change in demand results in a higher equilibrium price and a higher equilibrium quantity. The following graph shows the effect:

Market for plane tickets on Thursday – Friday



9. The article explains that “airlines are a very seasonal business” and demand varies “based on time of year, and even by day of week.” Additionally, “while ticket prices may change by hundreds of dollars based on season, baggage and other fees stay largely stable throughout the year.” Based on this information, does an airline’s revenue from base fare, or the revenue from ancillaries change more depending on the season?

Answer: Base fares vary more than the prices of checked luggage. In addition, the demand for tickets is more elastic than the demand for checked bags (see the explanation in Question 6). Therefore, the revenue from base fare varies more than the ancillary revenue.

10. Airline fees that are not included in the base fare lower the costs for airlines by providing incentives for passengers to behave differently, e.g., passengers check fewer bags. The European airline Ryan Air also “charge[s] a fee to check in with an agent, while checking in on a smartphone is free and easy.” In your own words, why charging a separate fee for checking bags and a fee for checking in with an agent might reduce the costs for airlines?

Answer: If passengers check in fewer bags, “bag belts last longer, airlines lose fewer bags, and maybe they don’t need as many people to load and unload the bags.” If more passengers have an incentive to check in without an agent, “airlines can both hire fewer agents over time and lease less space from the airport.” Therefore, airlines’ labor, maintenance and other costs decrease.