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Finding a fair airfare may be more difficult than doing an online search, according to industry experts.

What exactly goes into airline ticket pricing has long been a mystery, even to those who work for the companies. Online search engines use complex algorithmic math to find the "best" price at any given time.

But that "best" price may not actually be the lowest fare available, as pricing has become so complicated that the math behind fares doesn't make sense even to some mathematicians.

According to Carl de Marcken, former chief scientist and cofounder of *ITA software*, a company that provides research and optimization software and services to the travel industry, no specific price times a specific demand at that price equals the cost of flying an airplane. So, he said, airlines use revenue management, a system of fare rules dictating fare prices at different times for different people.

Andrew Goetz, chair of the geography department and faculty member of intermodal transportation at the University of Denver, said that while the true math behind airfares can't be nailed down, simple economics is one determining factor.

"At its most basic level, it's really a reflection of supply and demand," Goetz said. "It's whatever the market will bear. Airlines are always looking for ways to increase fares without scaring off potential customers. They look for opportunities to raise fares wherever they can."

In markets where airlines have a monopoly or only a few airlines have an oligopoly --- such as Casper --- airlines have a lot more pricing flexibility and control because no competition is encouraging them to lower prices and increase capacity.

"Unless you get real competition in those markets, fares are not going to come down significantly," Goetz said. "People in Casper should be entitled to decent air service at a decent price, and it's very unfortunate that that's not what's happening."

Because of increased fuel prices, particularly over the last few years, airlines have to make up for extra costs. And those costs have been passed almost directly to customers.

To maximize revenue, airlines take all the seats they have in coach and split them into different "buckets," or price levels. The forecast of demand, based on historical data on that same flight in the past, tells the airlines when to close which buckets.

"It's a very sophisticated mathematical engine," said Larry Weatherford, a business professor at the University of Wyoming and a revenue management specialist for airlines. "Taking into account the random nature of demand, you have a standard deviation of demand, so there will be more or less seats in each bucket

depending on those numbers."

In the past, Weatherford said, airlines sold tickets in cheaper buckets based on set restrictions. Passengers would have to stay over a Saturday night, tickets had to be purchased far in advance, and nothing was refundable.

But now, he said, airlines have tended toward a "first come first serve sort of thing, and there's not a lot of hard science to it."

Goetz's example of this tactic:

A plane has 100 seats. The first 20 seats — or the first bucket — are offered at \$250.

When those tickets sell out, the next 20 seats are sold for \$280. And when those are gone, the next 20 go for \$300.

As the plane fills, buckets get more and more expensive.

"They always save a few seats for people who are really desperate and who will pay whatever they can to get on that flight," Goetz said. "Airlines employ many, many people who are constantly scanning how the planes are filling up, what they're charging, and they're constantly tinkering with those fares."

The fares change so quickly, he said, that it's almost impossible to tell from day to day what a flight may cost.

"It's literally minute to minute. It changes all the time," he said. "Even on the websites — just because you're checking a fare out now doesn't mean it's going to be the same by the time you buy it. It can change even in the course of when you're online."

As for finding the best fare, Weatherford doesn't really think it's possible.

"There's really no way to know. It's a gamble," he said. His best advice, he added, is "the earlier you book it, the better. So book early."

Priced by the Pound The airlines' money-making tactic of charging by the pound may extend to more than baggage, according to one industry consultant.

Robert Mann, an airline industry analyst and chief consultant for R.W. Mann & Company, Inc., said airlines could reasonably begin charging passengers by weight.

"It all goes back to your first physics class. It takes twice as much energy to lift twice as much weight," he said. "Airlines spend a lot of time making planes lighter and doing other things that will save fuel, and then they'll sell a 6'4" 300 pound linebacker the same price ticket as a child who weighs half or a quarter his weight."

Mann said that with fuel costing the airlines more than any other operational cost, the airlines will soon have no choice but to weigh and price customers individually.

"Fuel prices seem not to be going anywhere but up," he said, "so continuing to charge passengers independent of how much they cost the airline is not rational anymore."

For any given fare With different fares, different sets of rules governing the fares, and several flights in each direction, two people going on a round trip together could encounter as many as 1036 fare combinations, or 10,000,000,000,000,000,000,000,000,000,000 combinations — 10 undecillion combinations.

What you (technically) pay for In a perfect world, airlines would base ticket prices directly upon costs. However, added rules and regulations make prices vary significantly.

According to the textbook "Air Transportation: A Management Perspective" by Alexander Wells and John Wensveen, part of what you pay for includes direct and indirect operating costs and a few extra fees.

Direct operating costs include:

- \* flight operations (largest category).
- \*flight crew expenses and labor.
- \*fuel and oil.
- \*aircraft insurance costs.
- \*other expenses, including training, route development, leases.
- \*maintenance and overhaul expenses.
- \*repairs to equipment.
- \*depreciation and amortization.
- \*flight equipment going down.
- \*new technologies replacing old.

Indirect operating costs remain unaffected by a change of aircraft type because they aren't directly dependent on aircraft operations. They include:

- \*salaries and expenses of airline staff stationed at airport (ticket-takers, customer service, etc.).
- \*ground handling equipment.
- \*ground transportation.
- \*rental or purchase of offices and associated facilities.
- \*general and administrative overhead.

Airfare expert Andrew Goetz said that while these costs make up part of the airfare, "if you actually tried to correlate fares with what it really costs to fly a plane from point A to point B, there isn't really a strong correlation."

"The type of flight and the costs associated don't really bear much relation to the prices that they're charging," he said. "It has to do with how airlines are looking to maximize revenues wherever they can."

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***Highlights: ITA software***