

# A brief history of aviation and aviation industry

[Transportation](#), [Airlines](#)



Man has always been fascinated by the prospect of flight. The human history of aviation dates well before the 1800s with more than fifty documented endeavors in flight. The Montgolfiers, two French brothers, succeeded in 1783 in creating the first true apparatus to " fly" when they created a linen, fire powered balloon that floated along for more than five miles. The first bona fide, patented plans for an airplane with an engine were developed in 1843 by William S. Henderson, although the plane was not actually capable of flying.

In 1848, John Stringfellow created a small, steam powered model plane that was capable of " brief flight. It was during the early 1900s when the actual turning point for aviation occurred and two determined brothers from Dayton, Ohio struggled to make their dream of flight a reality. Orville and Wilbur Wright disregarded several failed attempts to fly and persevered in their seemingly unattainable goal.. As a result, the Wright Brothers ushered in a new era of flight and the " air age" was born. Shortly thereafter, in 1905, the first aircraft company was created by two French fliers, Charles and Gabriel Voisin while Glenn Curtiss was founding the first US airplane company in New York.

In 1909, After the World War I the abundance of warplanes enabled them to be converted for commercial use and the U. S. Post Office began using aviation to its benefit with the introduction of " airmail" in 1918. After a continent-to-continent flight by Charles Lindbergh in 1927 when he flew from New Jersey to Paris in 33 hours generating strong support for aviation. Americans were no longer afraid to fly and the number of passengers dramatically increased as did private investments into the aviation industry.

In the modern era, aviation has broadened opportunities worldwide and has made our world increasingly smaller while it has allowed numerous technological advancements. Airline Industry Service Industry Because of all of the equipment and facilities involved in air transportation, it is easy to lose sight of the fact that this is, fundamentally, a service industry. In that sense, the airline business is similar to other service businesses like banks, insurance companies or even barbershops.

There is no physical product given in return for the money paid by the customer, nor inventory created and stored for sale at some later date. Capital-Intensive In contrast with many service businesses, airlines today need more than storefronts and telephones to get started. They need an enormous range of expensive equipment and facilities, from airplanes to flight simulators to maintenance hangars, aircraft tugs, airport counter space and gates. Consequently, the airline industry is a capital-intensive business, requiring large sums of money to operate effectively. Most equipment is financed through loans or the issuance of stock.

Airlines also lease equipment, including assets they owned previously but sold to someone else and leased back. Whatever arrangements an airline chooses to pursue, its capital needs require consistent profitability. Because airlines own large fleets of expensive aircraft that depreciate in value over time, they historically have generated a substantial positive cash flow (profits plus depreciation). Most airlines use their cash flow to repay debt, acquire new aircraft or upgrade facilities. When cash flow is significant, airlines may also issue dividends to shareholders.

Labor-Intensive The U. S. airline industry employs several hundred thousand pilots, flight attendants, mechanics, baggage handlers, reservation and customer service representatives, cleaners, analysts, salespersons, accountants, lawyers, engineers, schedulers, auditors, computer programmers and others. About half of airline workers belong to professional unions and are governed by collective bargaining agreements. Over the years, technological developments have enabled airlines increasingly to automate many tasks and operate more efficiently.

Yet the industry remains labor-intensive, with a substantial share of airline revenue set aside to pay the wages, benefits and payroll taxes of its workforce. Airline Profitability Airlines, through the years, have earned a net profit margin consistently below the average for U. S. industry as a whole. Indeed, in recent years they have typically lost money and, perhaps more importantly, failed to generate a return on investment that covers their cost of capital – the weighted average cost of debt and equity.

That phenomenon, due to a host of economic and governmental factors, transcends the U. S. market, as confirmed by data assembled by the International Air Transport Association (IATA). One way to think about airline industry profitability, particularly in the passenger sector, is to consider the metric known as break-even load factor. For every flight, and at the aggregate system level, there is an average occupancy rate – technically the ratio of revenue passenger miles to available seat miles – at which revenues and expenses are equal. That rate is the break-even load factor, sometimes abbreviated BELF.

Said differently, at a given level of expenses, cargo and ancillary revenues and average passenger yield (price paid per mile), it is the percentage of seats the airline (or industry) must sell to cover its costs. As revenue and costs vary from airline to airline and from flight to flight, so does BELF. Any combination of higher unit costs or lower average fares will raise the break-even load factor. In the early years of deregulation, the industry experienced an average break-even load factor of 65 percent, but rising fuel, labor and security costs over time, as well as decreasing real yields have driven that number closer to 80 percent.

There have been extended periods where many flights or entire carriers have seen BELF exceed 100 percent. Even in a profitable year, airlines typically operate very close to their break-even load factor. The sale of just one or two more seats on each flight can mean the difference between profit and loss. Airline Revenue and Costs On average, more than 90 percent of a U. S. passenger airline's revenue comes from the sale of tickets to passengers for scheduled air travel. Of the balance, the majority comes from cargo and other transport-related services.

For the all-cargo sector, of course, freight, express and mail is the sole source of transport revenue. Approximately three-fourths of all U. S. airline passenger revenue is generated from domestic service. The majority of tickets for international travel are processed by travel agents, most of whom rely on global distribution systems to keep track of schedules and fares, to book reservations and to print tickets for customers. Similarly, freight forwarders book the majority of air-cargo space. Like travel agents, freight

forwarders are independent intermediaries that match shippers with cargo suppliers.

Customer demand for personal transportation is seasonal – the summer months are extremely busy, as students are out of school and many individuals and families take vacations. Winter, on the other hand, sees less traffic, with the exception of the Thanksgiving and winter holidays. Accordingly, passenger traffic and revenue rise and fall throughout the course of any given year. Airlines have responded in kind by adjusting their schedules periodically to realign their scheduled capacity to better fit this ebb and flow.

Airline expenses can be grouped into the following major functions: flying operations (e. . , fuel, flight crew compensation, aircraft ownership), maintenance (e. g. , parts, labor), aircraft and traffic service (e. g. , ground service equipment, cargo handling, baggage, dispatch, gate agents), promotion and sales (e. g. , advertising, reservations agents, travel agency commissions), passenger service (e. g. , food and beverage, in-flight crew compensation), transport-related (e. g. , outsourced regional flying, cost of generating in-flight sales) and administration. Labor costs are common to nearly all of these categories.

When looked at as a whole, labor and fuel combined consistently account for approximately half of passenger airline operating expenses. Transport-related costs have grown sharply in recent years as many airlines have outsourced a substantial portion of their flying needs to smaller regional carriers to align supply and costs more closely with demand. Seat Configurations Adding seats to an aircraft increases its ability to generate

revenue at a low marginal cost. However, an aircraft's optimal seat configuration depends on the operator's marketing strategy.

If an airline is targeting price-sensitive consumers, such as leisure travelers, an airline will seek to maximize the number of seats to keep prices as low as possible. On the other hand, a carrier that is targeting service-oriented business clientele may opt for a less dense seat configuration with either a larger premium cabin and/or an economy cabin with greater seat pitch (the distance between the rows of seats). In reality, the key for most airlines is to strike the right balance as most serve a broad mix of both business and leisure customers.

**Overbooking** In seeking to maximize revenue across their networks and serve as many passengers as possible, airlines sometimes overbook flights, meaning they book more passengers than they have seats on a given flight. This is done to account for passenger "no-shows" and to avoid having to raise fares for those who do show for their flights. The practice, regulated by the Civil Aeronautics Board even before deregulation, is rooted in careful analysis of historic demand for a flight, economics and human behavior.

Historically, some travelers, especially business travelers buying unrestricted, full-fare tickets, either choose or fail to show for the flights for which they have a reservation. Both airlines and customers benefit when airlines sell all of the seats for which they have received reservations. Because an airline seat is a perishable product, if a customer fails to show up for a booked reservation, that seat cannot be returned for future use as in other industries. No-shows that result in unsold seats undermine airline

productivity, which otherwise contributes to lower airfares and more sustainable air service.

Consequently, airlines have found overbooking to be an economic necessity. Importantly for travelers, however, airlines do not overbook haphazardly. Rather, inventory management departments rigorously examine the history of particular flights to determine how many no-shows typically occur, and subsequently decide how many seats to authorize for sale. The goal is to align the overbooking with the eventual number of no-shows. In most cases the practice works effectively. Occasionally, however, when more people show up for a flight than there are seats available, airlines offer incentives to passengers to relinquish their seats. Travel vouchers are the most common incentive, with volunteers getting rebooked on another flight.

Historically, the revenue benefits of overbooking have outweighed the costs of these travel vouchers. In the rare cases in which there are too few volunteers, federal regulations require the airlines to compensate passengers for their trouble and help them make alternative travel arrangements. The amount of compensation is determined by government regulation. Pricing Since deregulation, airlines have generally had the same pricing freedom as companies in other industries.

They set fares and freight rates in response to both customer demand and the prices offered by competitors. As a result, fares change much more rapidly, and passengers sitting in the same section on the same flight often pay different prices for their seats. Although this may be difficult to understand for some travelers, it makes perfect sense, considering that a seat on a particular flight is of different value to different people. It is far



more valuable, for instance, to a salesperson who suddenly has an opportunity to visit an important client than it is to someone contemplating a visit to a friend.

The leisure traveler likely will make the trip only if the fare is relatively low. The salesperson, on the other hand, likely will pay a higher premium in order to make the appointment. For the airlines, the chief objective in setting fares is to maximize the revenue from each flight, by offering the right mix of full-fare, unrestricted tickets and various discounted tickets with restrictions. Too little discounting in the face of weak demand will result in a flight departing with many empty seats, a lost revenue opportunity.

On the other hand, too much discounting can sell out a flight far in advance and preclude the airline from booking last-minute passengers who might be willing to pay higher fares and therefore generate incremental revenue. The process of managing the right mix of prices and inventory for each flight is called revenue management. It is a complex process, requiring sophisticated computer software that helps an airline estimate the demand for seats on a particular flight, so that it can price the seats accordingly. And it is an ongoing process, requiring continual adjustments as market conditions change.

**Scheduling** Since deregulation, airlines have been free to enter and exit any domestic market at their own discretion, and have adjusted their schedules often in response to market opportunities and competitive pressures. Along with price, schedule is an important consideration for air travelers. For business travelers, who typically are time-sensitive and value convenience, schedule is often more important than price. A carrier that operates several

flights a day between two cities has a competitive advantage over carriers that serve the market less frequently or less directly.

Airlines establish their schedules in accordance with demand for their services and their marketing objectives. Scheduling, however, can be extraordinarily complex and must take into account aircraft and crew availability, maintenance needs and local airport operating restrictions. Contrary to popular myth, airlines do not cancel flights because they have too few passengers for the flight. The nature of scheduled service is such that aircraft move throughout an airline's system during the course of each day.

A flight cancellation at one airport, therefore, means the airline will be short an aircraft someplace else later in the day, and another flight will have to be canceled, rippling costs and foregone revenue across the network. Fleet Planning Selecting the right aircraft for the markets that an airline wants to serve is vitally important to its financial success. As a result, the selection and purchase of new aircraft is usually directed by an airline's top officials, although it involves personnel from many other divisions such as maintenance and engineering, finance, marketing and flight operations.