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Institutional Setting and Carrier Viability in the Airline Industry: A Continuing Review of the
Post-Deregulation Experience

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Abstract

Following World War I, the US commercial aviation industry began to take off as the federal government sought private airlines to carry mail across the country. By 1938, the government set the industry under strict regulation, and carriers started relying more on passenger service as a source of revenue. During this regulated era, the airlines could not use price competition to win customers resulting in carriers using scheduling flexibility and quality of service to compete. Regulation ensured carriers a stable return and passengers with a safe mode of transportation. However, by the early 1970s, economists and politicians concluded that the strict regulatory environment led to an inefficient market outcome. In 1978, the government deregulated the airline industry ending the regulatory constraints on fares, entry and exit, and service amenities. After almost 40 years of a deregulated domestic airline market, the time is appropriate to observe the effects of both policy regimes and to study how deregulation affected the US airline industry.

This thesis seeks to organize and present various yet dispersed sources of economic history, analysis, and commentary in order to compare and contrast the effects of regulation and deregulation on the airline industry. The detailed discussion of various “retail metrics” aims to illustrate the current economic instability plaguing the industry. The first section provides an economic history of the development of the domestic airline industry. The next section briefly describes the motivations behind deregulation. The third section reviews various industry metrics and economic literature to compare and contrast the effects of regulation and deregulation. The fourth section explains the successes and failures of economic deregulation in the context of the last decade. The thesis concludes with a short discussion of various suggested policy options.

Keywords: airlines, deregulation, network economics, economic instability

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I. Introduction

Beginning in 1938, the US federal government began to regulate the domestic commercial airlines by setting fares, controlling entry / exit and merger policy, and establishing safety standards. Under this strict regulatory environment, the airline industry would carry more and more passengers and earn stable returns over the next 40 years, but in the 1970s, a growing consensus of economists and politicians concluded that regulation promoted an inefficient market outcome. At the forefront of federal economic deregulation, the airlines were freed in 1978 from almost all regulatory constraints including fares, entry and exit on routes, and service amenities. Airlines faced 40 years in a highly regulated market and will soon have experienced 40 years of the competitive forces of a deregulated market. These nearly equal time periods present an ideal opportunity to observe the effects of both broad policies and to study the results of deregulation in today's US airline industry.

The goal of this thesis is to organize and present various yet dispersed sources of economic history, analysis, and commentary. This information will be used to convey the current economic condition of the domestic airline industry. Then, through the use of a multitude of available "retail" metrics, this thesis will compare and contrast both eras of regulation and deregulation in order to provide guidance for the formulation of future airline policies. To complete this task, this document is divided into four main sections. The first describes the economic history of the commercial aviation industry in the US from its emergence in the early 20th century through the regulated period between 1938 and 1978. The next brief section provides the motivations for economic deregulation in 1978. The third section introduces various industry metrics and economic literature to demonstrate the economic effects following deregulation. The fourth section seeks to consider the successes and failures of economic

deregulation in the context of the industry's performance over the past decade and hopefully to provide forward-looking insights to the long-run sustainability of the airline industry. The thesis concludes with a brief discussion of various suggested policy options.

II. Regulatory Retrospective: 1938 - Present

Commercial aviation in the United States has changed drastically since its humble beginning after World War I. Today, hundreds of millions of Americans travel across the country every year with relative ease and affordable fares. However, the current convenience obscures the early struggles of the industry to get off the ground. The fledgling industry needed help from both government and entrepreneurial businessmen before it could grow to become one of the largest industries in the country. This section provides an outline of the foundations of the commercial aviation industry in the US since the beginning of the 20th century, and the history is drawn largely from T.A. Heppenheimer's *Turbulent Skies: The History of Commercial Aviation*.

After World War I, people could afford to buy cheap aircraft and engines thanks to a large post-wartime surplus. Initially, planes were mostly used for crop-dusting, skywriting, aerial mapping, and short county-to-county taxi services.¹ At this time, railroads were the major form of passenger transportation for intercity traveling and transcontinental journeys as aircraft technology was still in its infancy. The US Post Office Department had contracts with the railroads to carry mail cross-country, but this department wanted a faster and cheaper option for moving mail across such an expansive and growing country. The PO Department began operating airplanes on routes between Washington, DC, Philadelphia, and New York City in the Spring of 1918, but at these short distances, the speed of these early aircraft could not compete

¹ T.A. Heppenheimer. *Turbulent Skies: The History of Commercial Aviation*. (New York: John Wiley & Sons, 1995), 6.

with the economics of trains.²In 1920, the PO Department began a transcontinental route to San Francisco. Pilots followed the Union Pacific Railroad for navigation while hopping between landing fields about 200 miles apart. Still, the railroads had the advantage of being able to travel at night.³ Then, the PO Department started to place beacons and lights on certain segments of the transcontinental route allowing for their planes to operate through the night. This innovation allowed planes to beat trains by two to three days. By 1924, planes could make the cross-country trip in about 30 hours.⁴ As railroads began to lose revenues from the Post Office's switch to their own airmail, Congress passed the Contract Air Mail Act of 1925 which forced the PO Department to sell airmail contracts to private carriers, including the railroads, could buy.⁵ Many entrepreneurs of the era began to bid for airmail contracts such as William Rockefeller, Cornelius Vanderbilt Whitney, and Henry Ford.⁶ As the airmail industry began to take off, Congress enacted the Air Commerce Act of 1926 which required certificates and registration of aircraft, pilot and crew training, and air traffic rules. Additionally, the Department of Commerce began to produce maps and weather reports for pilots, investigate airplane accidents, and build more illuminated airways.⁷ Juan Trippe was one of the leading airline businessmen in the industry's early history and was the face of Pan American Airlines. He used political connections to influence the Foreign Air Mail Act of 1928 and was later able to control the mail route to Cuba. The Foreign Air Mail Act allowed the PO Department to award airmail contracts to the "lowest responsible bidders" instead of simply the lowest bidder.⁸ This provision would be highly important as airmail service continued expanding domestically and internationally.

² Ibid, 8.

³ Ibid, 9.

⁴ Ibid, 11.

⁵ Ibid.

⁶ Ibid, 12.

⁷ Ibid, 14.

⁸ Ibid, 28.

Maybe a visionary, Postmaster General Walter Folger Brown thought airmail contracts were inefficient and expensive and saw the future of commercial aviation in larger planes and passenger transportation. He used his position and influence to push for the McNary-Watres Air Mail Act of 1930 which gave Brown authority to change airmail policy in pursuit of his dream vision for the industry.⁹ Just as Brown had hoped, this new provision provided an incentive for the airlines to shift focus from cargo to passenger revenue growth. Another controversial provision gave Brown the authority to extend or consolidate routes that he felt would better the public's interest.¹⁰ Brown wanted three transcontinental routes (northern, central, and southern) operated by three separate carriers. In May 1930, Brown met with representatives of the largest airlines (purposely excluding the small airlines) in what would later be called the "Spoils Conference".¹¹ After initial disagreements and antitrust concerns, Brown and the airlines decided that Transcontinental Air Transport and Western Air Express would merge to form Transcontinental and Western Air (TWA) and take the central route, American Airways the southern route, and United Airlines the northern route.¹² Brown was able to ensure that his choice airlines would win the routes using the "lowest *responsible* bidder" clause to eliminate the other bidders.¹³ Although there was opposition to Brown's decisions, he was successful with creating four major domestic carriers (including Eastern Airlines which operated along the Atlantic Coast).¹⁴ Not only did Brown drastically change the industry's structure with his handpicked carriers, his decision to change the airmail rate to a volume-based rate helped to spur

⁹ Ibid, 34.

¹⁰ Edmund Preston, "U.S. Centennial of Flight Commission: The Federal Aviation Administration and Its Predecessor Agencies," *Centennial of Flight*, accessed February 10, 2014, "U.S. Centennial of Flight Commission: The Federal Aviation Administration and Its Predecessor Agencies." *Centennial of Flight*. Accessed February 10, 2014. http://www.centennialofflight.net/essay/Government_Role/FAA_History/POL8.htm.

¹¹ T.A. Heppenheimer. *Turbulent Skies: The History of Commercial Aviation*. (New York: John Wiley & Sons, 1995), 34-5.

¹² Ibid, 36.

¹³ Ibid.

¹⁴ Ibid.

innovation as airlines had to increase speeds to compete with railroads for passengers.¹⁵ Aircraft manufacturers began to develop new airplanes with new technologies that increased cruising speed and carrying capacity. In 1931, Delta acquired 2-years of exclusive use of the new Boeing 247 which could carry 10 passengers giving Delta a competitive advantage over its competitors.¹⁶ In response, Douglas Aircraft developed the DC-2 which was faster and could carry 12 passengers to compete with Boeing's 247.¹⁷ The rivalry between Boeing and Douglas would become an important part of development of the airline industry.

After Postmaster General Brown used his authority to limit competitive bidding of airmail contracts, Senator Hugo Black began investigations into airline collusion and Brown's involvement.¹⁸ In addition to Brown hand-choosing airlines to succeed, Black's investigations found that the airline holding companies were manipulating stocks prices. These findings helped support the case for securities industry reform such as the Glass-Steagall Act and the Securities and Exchange Act.¹⁹ Upon hearing the findings of Black's investigations, in February 1934, President Franklin Delano Roosevelt canceled all government airmail contracts and requested the Army Air Corps deliver mail until new contracts were made, but the Air Corps pilots had no experience flying in bad weather, at night, or on the mail routes; this decision led to disastrous consequences.²⁰ After several pilots crashed and died in the first weeks, the public outrage against Roosevelt was high while the airlines were suffering from lost revenues from airmail contracts, but he required the airlines paid a steep price to win back the government contracts.²¹ Under the Air Mail Act of 1934, airline officials who took part at the "Spoils Conference" were

¹⁵ Ibid, 37.

¹⁶ Ibid, 47.

¹⁷ Ibid, 53-4.

¹⁸ Ibid, 56.

¹⁹ Ibid, 57.

²⁰ Ibid.

²¹ Ibid, 59-60.

barred from industry leadership, aviation holding companies had to break up so that aircraft manufacturers could not buy an airline to guarantee a market for its aircraft, and the airmail rates were drastically decreased.²² In the end many airlines did regain their old routes, but Braniff Airways and Delta Air Lines won their first routes and would become major players in the industry.²³ Juan Trippe's Pan Am was not affected by FDR's cancellation as it only applied to domestic routes and continued to make high profits with his monopoly on international airmail routes.²⁴

In response to the government's cuts in airmail rates, the airlines needed to rely more on revenues from passenger services. The Douglas DC-3 would provide the next step forward as it was faster and had lower operating costs than previous aircraft leading to shorter travel times and lower fares which made airline travel accessible to more Americans as the country climbed out of the Great Depression.²⁵ Between 1938 and 1940, passenger traffic doubled to 3 million annually, but this number was still minor compared to the railroads 456 million passengers in 1940.²⁶

In 1939, Howard Hughes entered the industry when he bought a controlling share of TWA. He would drastically alter the fate of the airline industry. As his competitors United and American focused on the development of a slightly improved DC-4, Hughes and Lockheed secretly began development on a superior aircraft, the Lockheed Constellation (or Connie). The Lockheed would have a pressurized cabin allowing it to fly above weather and prevent airsickness and it would be capable of cruising at 280mph.²⁷ By keeping this design secret and

²² Ibid, 60-1.

²³ Ibid, 63.

²⁴ Ibid, 67.

²⁵ Ibid, 72.

²⁶ Ibid.

²⁷ Ibid, 111-2.

exclusive to TWA, Hughes anticipated a major competitive advantage over his rivals who would be flying the inferior DC-4. However, in 1941 while the DC-4 and Connie were still under development, the War Department exposed the secret as the attack on Pearl Harbor led the Army Air Forces to draft both these aircraft into wartime service. Despite the performance advantages of the Lockheed plane, the Army Air Force preferred the simpler DC-4.²⁸ In response to the Connie, Douglas quickly began to develop the DC-6 but would be years behind the Connie which had shown in its April 1944 test flight that it was the first plane that could fly nonstop from coast to coast.²⁹ After World War II ended, the Army's demand for the DC-4 resulted in a post-war surplus. This allowed airlines to buy aircraft and retrofit it for airline service.³⁰ To compete with TWA's coast-to-coast service, American and United did not receive their DC-6 orders until the Spring of 1947.³¹

In April 1945, Trippe helped to organize a cartel of international carriers (many of which were operated by national governments) called the International Air Transport Association (IATA) which set fares by unanimous consent and was enforced by their governments.³² After World War II, European carriers needed new aircraft and under the Marshall Plan and with the help of IATA, Europe became a major export market for the American airplane manufacturing industry.³³ Also after World War II, TWA sought to compete with Pan Am for overseas routes and changed its name to Trans World Airlines in 1945.³⁴ Before the war, Hughes had disclosed

²⁸ Ibid, 114.

²⁹ Ibid, 115.

³⁰ Ibid.

³¹ Ibid, 116.

³² Ibid, 117.

³³ Ibid.

³⁴ Ibid, 118.

the Connie designs to Trippe so that Pan Am could place orders and ensure that the Connie program proved successful.³⁵

Prior to World War II, the federal government made a decision which would dramatically alter the future of the commercial aviation industry. In 1938, President Roosevelt signed the Civil Aeronautics Act which would define the airline industry for the next forty years. An independent Civil Aeronautics Authority (CAA) would investigate accidents and make recommendations to ensure air transport safety.³⁶ In 1940, President Roosevelt split the CAA into the Civil Aeronautics Administration (CAA) under the Department of Commerce and the Civil Aeronautics Board (CAB); the CAA was responsible for Air Traffic Control, pilot and aircraft certification, enforcement of safety regulations, and development of new airways while the CAB was charged with writing safety regulations, investigating accidents, and economic regulating of the airlines.³⁷ It also brought the government's air traffic control centers and airport control towers into standardization with new regulations forcing pilots to obey controllers' instructions and requiring aircraft to carry mandated flight instruments for flying in bad weather.³⁸ In 1941, the CAA opened Air Traffic Controllers training facilities and standardized procedures, equipment, and taxi and traffic patterns.³⁹ The new economic and safety regulations had dramatic impacts on the industry over the next forty years. For instance, during the 1940s, the fatality rate steadily dropped with new safety regulations while between 1940 and 1946, the cost of an average ticket decreased by 33 percent (constant dollars) which allowed the airlines to

³⁵ Ibid.

³⁶ "The Federal Aviation Administration: A Historical Perspective, 1903-2008: Chapter 1: Prologue," Accessed March 31, 2014, https://www.faa.gov/about/history/historical_perspective/, 5.

³⁷ Ibid, 5-6.

³⁸ T.A. Heppenheimer. *Turbulent Skies: The History of Commercial Aviation*. (New York: John Wiley & Sons, 1995), 123.

³⁹ Ibid.

compete directly with the railroads for passenger services.⁴⁰ To guarantee the airlines with a fair rate of return, the CAB set fares and determined routes and controlled market entry and exit. The regulation of the airlines prevented interstate domestic carriers from exposure to competitive market forces. Since airlines could not control prices, the carriers competed on convenience, comfort, and reliability.⁴¹

In the late 1940s, the birth of nonscheduled airlines which flew during off-peak hours using cheap surplus military planes brought some level of competition to the industry because these “nonskeds” would only fly if enough passengers showed up in response to very low fares.⁴² Although these carriers offered low comfort and poor service for low prices, the major carriers reacted by offering reduced coach class fares.⁴³ Consumers’ willingness to trade lower fares for discomfort was a hint of the future of the airline industry. Around the same time, Douglas and Lockheed began another round of aircraft competition with the DC-6B and Super Constellation, respectively, which offered the first true transcontinental journey as these planes could carry substantially more passengers and were fast enough to abide by the work rules of the pilots’ unions.⁴⁴ However, these advanced propeller-driven planes would soon be eclipsed. The US Air Force was pushing the development of the jet engine. The British beat the Americans with this technical advancement when they commercialized the de Havilland Comet in early 1952.⁴⁵ Despite its high operating costs, the quieter and much faster Comet attracted enough passengers for British Overseas Airways Corporation (BOAC) to profit from these new airliners.⁴⁶ Even though the British success caught the attention of US airline executives such as Trippe, US

⁴⁰ Ibid, 124-5.

⁴¹ Ibid, 125.

⁴² Ibid, 126-7.

⁴³ Ibid, 127.

⁴⁴ Ibid, 130.

⁴⁵ Ibid, 155.

⁴⁶ Ibid, 156.

airlines were slow to respond due to their preoccupation with the development of nonstop coast-to-coast service.⁴⁷

While Boeing had been successful in the military aircraft market, the aircraft manufacturer attempted to enter the commercial market with Lockheed and Douglas by designing the Dash-80 (or Boeing 707). Boeing's original design sought to serve both military and civil needs, selling it first to the Air Force as a jet-tanker to cover the costs of development and then the commonalities would cut costs for the commercial version.⁴⁸ In May 1954, Boeing announced the jetliner called the Dash-80 at the same time the Comet was plummeting from the skies of success, quite literally.⁴⁹ After some of the first Comets crashed due to metal fatigue, the Comet IV's development was halted for redesign and recertification, putting the British behind in the jet game.⁵⁰ While Boeing had the advantage of government funds supporting the development costs of its 707 program, Douglas' strategy involved waiting for the airlines to react to the Boeing 707 design and then respond with its own improved design, the DC-8. Seeing an opportunity to use the aircraft manufacturer rivalry to his advantage, Trippe made the largest purchase in the history of the industry at the time when in October 1955 he ordered twenty 707s and twenty-five DC-8s for \$269 million.⁵¹ Trippe preferred the DC-8 as it could reliably cross the Atlantic nonstop, unlike the 707, but the 707 would be ready earlier; he then would sell the 707s when the DC-8 became available.⁵² Knowing the Boeing 707 was a losing gamble and that Boeing was unready to continue competing in the military market, Boeing CEO William Allen made a bold move: he ordered a redesign of the commercial 707 Intercontinental sacrificing the

⁴⁷ Ibid, 156-7.

⁴⁸ Ibid, 154.

⁴⁹ Ibid, 158.

⁵⁰ Ibid, 160.

⁵¹ Ibid, 165.

⁵² Ibid.

commonality (i.e. cost savings) with the Air Force Tanker and offered the airlines custom versions of the 707.⁵³ Boeing's gamble would pay off in the end: Boeing sold almost a thousand 707s over the 556 DC-8s sold by Douglas.⁵⁴

The age of the jetliner had begun, but airports were not ready for the increase in speeds and in the number of passengers.⁵⁵ Under Eisenhower, the CAA faced deep spending cuts for facilities and equipment, yet the fatality rate continued to drop: in 1952 and then again in 1954, there were no fatalities.⁵⁶ However, the cuts in spending on important programs for improving air traffic control would quickly prove costly. On June 30, 1956, two airplanes collided over the Grand Canyon killing 128 people.⁵⁷ Unsurprisingly, the government reacted to tragedy by reversing its course with the CAA. The CAA's budget began to increase rapidly afterwards with its originally 5-year ATC system upgraded in 3 years.⁵⁸ In 1958, the CAA gained independence from the Department of Commerce.⁵⁹ While the CAB would remain responsible for accident investigations, the newly established Federal Aviation Agency (FAA) was charged with safety-rulemaking and reported directly to the President.⁶⁰

At the beginning of 1959, more airlines were introducing jetliner service on transcontinental routes, but few airports had runways long enough for jets to land.⁶¹ Also, the public began to complain loudly about the jet noise in communities surrounding airports, but the solution was the development of the turbofan (or fanjet) which provided better fuel economy and

⁵³ Ibid, 168-9.

⁵⁴ Ibid, 169.

⁵⁵ Ibid, 172.

⁵⁶ Ibid, 175.

⁵⁷ Ibid, 178.

⁵⁸ Ibid, 181.

⁵⁹ Ibid, 183.

⁶⁰ Ibid.

⁶¹ Ibid, 185.

was quieter.⁶² As public complaints about jet noise softened, the DC-8 and 707 Intercontinental could fly nonstop over 4000 miles giving airlines a substantial advantage over passenger travel by ocean liner or rail, which were already facing competition from automobiles and the new built interstate highway system.⁶³ The age of the jetliner led people to envision the future of jets that travelled at supersonic speeds, but these ambitions would not prove as fruitful as the jetliner.

In the early 1960s, the French and British began a development program for the supersonic Concorde.⁶⁴ The British saw this project as a second chance after the brief success yet ultimate failure of the Comet; the French, under Charles de Gaulle, resented the American domination of European markets, and the British needed French support to enter the European Common Market.⁶⁵ The Concorde project provided a mutually beneficial opportunity for both countries. In the US, President John F. Kennedy directed the FAA to develop the American supersonic transport (SST) to challenge the Concorde program, and the new head of the FAA was a strong supporter of the SST.⁶⁶ Again, Trippe saw this competition between the American SST and Anglo-French Concorde as business opportunity: he announced that he intended to order six Concorde but preferred American SSTs.⁶⁷ However, both these supersonic jet programs would face huge financial problem in their countries which would make them highly contested national projects. After the US airlines refused to cover 25 percent of the SST development costs, an outside commission determined that government should cover 90 percent.⁶⁸ Also, the FAA would remain in control of the SST project, but high-level decisions would be made by Defense Secretary Robert McNamara who would only move forward if the

⁶² Ibid, 186-7.

⁶³ Ibid, 191.

⁶⁴ Ibid, 200.

⁶⁵ Ibid, 202, 205.

⁶⁶ Ibid, 207.

⁶⁷ Ibid.

⁶⁸ Ibid, 212.

SST promised profitability, resulting in many delays for more and more analyzes.⁶⁹ Across the Atlantic, the Concorde started experiencing cost overruns in 1964 and British government began to see the Concorde as a prestige project and wanted to cancel, but since the treaty between France and Britain did not include a cancellation clause, Britain was unable to abandon the Concorde and was forced to continue with the Concorde program.⁷⁰

While Britain, France and the US were focused on building supersonic commercial jets, the US Air Force selected Lockheed in September 1965 to develop a wide-body subsonic aircraft called the C-5A which would offer huge economies of scale.⁷¹ At the time, the US airline industry believed that the supersonic jets like the SST would fly overwater routes because sonic booms would prevent it from taking over domestic routes and wide-bodies, such as the Boeing 747, would be used for air freight.⁷² Boeing took another huge gamble by investing in a new facility in Everett, Washington to build the enormous Boeing 747.⁷³ In April 1966, Tripple ordered 23 passenger 747 and two freight 747s for \$531 million and five other airlines followed with another 28 more orders.⁷⁴ After Lockheed won the C-5A contract, Boeing began development on the 747, but then Boeing won the SST proposal in 1966.⁷⁵ In the meantime, American Airlines wanted something bigger than the current jetliners yet smaller than the 747, and Douglas and Lockheed aimed to fill this market need with the DC-10 and L-1011, respectively.⁷⁶ The five major airlines (American, Eastern, United, TWA, and Delta) would determine which aircraft would succeed. First, American agreed to buy 25 DC-10s, hoping that the airlines would choose either Douglas or Lockheed, and the winner would be able to compete

⁶⁹ Ibid, 214.

⁷⁰ Ibid, 214-5.

⁷¹ Ibid, 220.

⁷² Ibid, 221.

⁷³ Ibid, 223.

⁷⁴ Ibid.

⁷⁵ Ibid, 224-5.

⁷⁶ Ibid, 225.

with Boeing in the next generation of planes.⁷⁷ However, Eastern, TWA, and Delta placed orders for the L-1011.⁷⁸ Last in line, Delta chose the DC-10 because its price was slashed to keep Douglas in business and because GE (its engine manufacturer) was trying to enter the aircraft engine market.⁷⁹

Boeing and Pan Am's 747 designs continued to get heavier requiring more powerful engines from Pratt & Whitney, and other design problems caused more delays.⁸⁰ Then in 1970, a recession caused passenger growth to collapse and airlines subsequently cut their 747 orders which put Boeing in a difficult financial situation where the firm was forced to cut thousands of employees.⁸¹ To make matters worse, Boeing's SST development started to run into problems and delays.⁸² At this time, Americans were becoming concerned about air and water pollution, and environmental organizations such as the Sierra Club opposed the SST program fearing damage to the ozone layer.⁸³ Along with environmental concerns, many prominent economists including Milton Friedman, Kenneth Arrow, and Paul Samuelson signed a statement opposing the SST program on economic grounds.⁸⁴ Despite union support, in December 1970, Congress voted to end the SST program dealing another blow to Boeing.⁸⁵ With the SST program canceled and 747 orders cut, Boeing began to trim corporate fat and to make efficiencies in factory operations resulting in major reductions in building times.⁸⁶ Boeing decided to improve earlier designs of the 727 and 737 with better engines with improved fuel efficiency and lower

⁷⁷ Ibid, 234.

⁷⁸ Ibid, 235-6.

⁷⁹ Ibid, 236-7.

⁸⁰ Ibid, 231-3, 237-8.

⁸¹ Ibid, 239.

⁸² Ibid, 241.

⁸³ Ibid, 244-5

⁸⁴ Ibid, 245.

⁸⁵ Ibid, 247.

⁸⁶ Ibid, 255.

operating costs.⁸⁷ Sales of 707s, 727s, and 737s to domestic airlines and to growing Third World countries allowed Boeing to avoid bankruptcy long enough for 747 orders to pick up.⁸⁸

In January 1971, Rolls-Royce went bankrupt leaving Lockheed's L-1011 without an engine and Lockheed itself was in the need of a federal loan guarantee to avoid bankruptcy.⁸⁹ After cutting the SST program, the Democratic Congress could not risk more jobs and the loan to Lockheed was approved.⁹⁰ In the end, the L-1011 never recouped its development costs, and Lockheed exited the commercial aviation industry and became solely a military contractor.⁹¹ The McDonnell-Douglas DC-10 program succeeded modestly, but it would be the last new airliner designed by the firm.⁹² With Lockheed and McDonnell-Douglas in decline, Boeing was in a strong position for the future. The Concorde lost ground as Pan Am and TWA decided against buying the supersonic jet as they were more expensive and less fuel efficient than wide-body planes which was of primary importance during the two energy crises of the 1970s.⁹³

During the Lyndon B. Johnson Administration, the FAA focused more on the SST program than air traffic control upgrades, but after two private aircraft and airliner collisions, the FAA would begin to computerize air traffic control.⁹⁴ Since the FAA needed more money to implement these new air traffic control systems, Congress passed the Airport and Airway Development and Revenue Acts of 1970 to establish a fund for new taxes on tickets, air cargo, and fuel used by private planes and airliners.⁹⁵ This act freed the FAA from Congressional

⁸⁷ Ibid, 256.

⁸⁸ Ibid, 257.

⁸⁹ Ibid, 253.

⁹⁰ Ibid, 254.

⁹¹ Ibid.

⁹² Ibid.

⁹³ Ibid, 258-9.

⁹⁴ Ibid, 267-9.

⁹⁵ Ibid, 271.

appropriations and would provide more money as more people flew.⁹⁶ Air Traffic Controllers were required to receive high level of training, but the working conditions were stressful and poor as overtime was mandatory with ten hour days, six days a week.⁹⁷ In 1968, Air Traffic Controllers established the Professional Air Traffic Controller Organization (PATCO) which organized slowdowns and sickouts (as federal employees, they could not strike) causing major delays at airport in an effort to encourage the FAA to hire more controllers to spread workload, to increase pay, and to earn time and a half for overtime.⁹⁸ The airlines sued PATCO for \$100 million in losses, and although PATCO settled for \$100,000, the judge ordered PATCO to call off job actions.⁹⁹ The union's actions did win some work improvements: in 1972, Congress passed an act which allowed controllers to retire on pension between 50 and 55 and receive job training if needed.¹⁰⁰ In 1977, another PATCO slowdown won controllers salary upgrades.¹⁰¹ During his 1980 Presidential Campaign, Reagan promised to support PATCO if elected and, thus he won the union's support.¹⁰² After Reagan won, PATCO began making high demands, but the FAA responded with much a lower counter offer leading to a PATCO strike in August 1981.¹⁰³ Instead of supporting PATCO, Reagan issued an ultimatum to the controllers: return to work in two days or lose their jobs.¹⁰⁴ Only about 10% returned and the FAA fired 11,345 controllers, and Reagan froze PATCO's strike fund and voided its legal right to represent the controllers.¹⁰⁵ The FAA and the airlines agreed to cut flights to stretch its limit resources, and the unionized pilots and airplane machinists refused to strike in support of PATCO, which was facing backlash

⁹⁶ Ibid.

⁹⁷ Ibid, 277-8.

⁹⁸ Ibid, 278-9.

⁹⁹ Ibid, 280.

¹⁰⁰ Ibid.

¹⁰¹ Ibid.

¹⁰² Ibid.

¹⁰³ Ibid.

¹⁰⁴ Ibid.

¹⁰⁵ Ibid.

from the public as well.¹⁰⁶ The FAA had to begin training an entire new generation of air traffic controllers forcing overtime on the small workforce while the agency tried to catch up.¹⁰⁷

Although the British and French Concorde failed to change the airline industry as many had thought supersonic jets would, Germany, France, and Britain agreed in 1966 to pursue a design of a new twinjet airliner called the “Airbus”.¹⁰⁸ Learning from the mistake of the Concorde program, France used a new arrangement removing the country’s ministries from decision-making, and the arrangement had the advantage of no legal requirement to publish corporate records or financial statements which kept the huge subsidies hidden.¹⁰⁹ In October 1972, the A-300 took its first flight, but Airbus had only sold 38 to four airlines by end of 1977 and was beginning to look like another failure.¹¹⁰ When an order to Western Airlines fell through in 1977, Eastern Airlines took advantage of Airbus’ weak position: Airbus lent Eastern four aircraft for Eastern’s New York to Miami route rent-free.¹¹¹ Eastern found the A-300 more reliable and had lower fuel costs than the L-1011, but the A-300 had higher operating costs because it was larger.¹¹² Airbus decided to compensate Eastern for the difference in operating costs, and Eastern agreed to buy 23 A-300s.¹¹³ In comparison to the triple engine L-1011 and DC-10, the A-300 had only two engines saving on maintenance and weight and allowed for more seats with its compact design.¹¹⁴ In 1978, Boeing announced its wide-body 767 twinjet to compete with the A-300 and its narrow body 757 to succeed the 727, but these were years away

¹⁰⁶ Ibid, 281.

¹⁰⁷ Ibid, 282.

¹⁰⁸ Ibid, 294.

¹⁰⁹ Ibid, 296.

¹¹⁰ Ibid.

¹¹¹ Ibid.

¹¹² Ibid.

¹¹³ Ibid.

¹¹⁴ Ibid.

from availability.¹¹⁵ During the oil crisis of 1979, Airbus outsold Boeing in wide-body airliners and developed the A-310 as a smaller version of the A-300.¹¹⁶ The wide-body Boeing 767 and Airbus A-300 and A-310 were the new generation of aircraft which cut costs by carrying more people with fewer engines.¹¹⁷ The reliability of these wide-body twinjets allowed the FAA to agree to a new rule which increased the maximum time a plane could be from an emergency landing strip from 75 to 120 minutes, and this rule allowed certain aircraft designated ETOPS (extended twin operations) to fly direct routes across the Atlantic.¹¹⁸ Airbus would continue to expanding its fleet of commercial aircraft with the A-320 to compete with Boeing's 737 and Douglas' MD-80 series for short range routes and then the A-330 and A-340 to compete head-to-head with Boeing, and by 1994, Airbus overtook Boeing in number of orders.¹¹⁹ On the other hand, Boeing's 747 had been premature in the 1960s with only Pan Am in need of such huge aircraft, but by the 1980s, the 747 was perfect for the market.¹²⁰ By the 1980s, the 747 was relatively cheap to make having been in production for 20 years and with high demand and no rival to it, Boeing made huge profits which could be used to cut prices on its smaller aircraft and earn more revenues from parts and services.¹²¹ The rivalry between Airbus and Boeing continues to this day.

III. Elimination of the Civil Aeronautics Board

A. Regulatory Context

Beginning in 1938, the CAB regulated the US airline industry, protecting the airlines from market forces by limiting entry of air carriers into new markets and regulating fares which

¹¹⁵ Ibid, 298.

¹¹⁶ Ibid.

¹¹⁷ Ibid, 299.

¹¹⁸ Ibid, 300.

¹¹⁹ Ibid, 302.

¹²⁰ Ibid, 302-3.

¹²¹ Ibid, 303.

ensured the airlines some level of profit. Fifty years after the Spoils Conference at which Postmaster Brown handpicked airlines to succeed, those four airlines (United, American, Eastern, and TWA) remained the largest domestic carriers. Meanwhile, Pan Am, which Brown had granted a monopoly of overseas flights, remained the leading international carrier.¹²² Between the 1938 and 1978, of the 16 original trunk-line carriers, only five had received permission to merge, and no major airline had ever gone bankrupt thanks to the CAB's protected rate of return.¹²³ Even if an airline applied to serve a route served by others, competitors would object with protracted legal objections.¹²⁴ The established airlines, their banks, and their labor union supported CAB regulation - deregulation threaten the status quo of guaranteed profits.¹²⁵ However, Senator Edward Kennedy strongly called for deregulation and even some of the CAB staff supported deregulation. In 1975, Senator Kennedy held Judiciary Committee hearings to discuss the inefficiencies of regulation.¹²⁶ By April 1976, the CAB announced its support for deregulation acknowledging the inefficiencies of aviation regulation.¹²⁷ Appointed to the head of CAB in 1976, John Robson began modest reforms from within the CAB such as approving discount fares and expanded charter operations.¹²⁸ For instance, Freddie Laker, owner of British charter carrier Lake Airways, started a new transatlantic service called Skytrain which offered ultra-low fares with no reservations and no travel agents.¹²⁹ In response to new low-fare charter

¹²² T.A. Heppenheimer, *Turbulent Skies: The History of Commercial Aviation*. (New York: John Wiley & Sons, 1995), 314-5.

¹²³ *Ibid.*, 315.

¹²⁴ *Ibid.*

¹²⁵ *Ibid.*, 316.

¹²⁶ Severin Borenstein and Nancy L. Rose, "How Airline Markets Work...Or Do They?," In *Economic Regulation and Its Reform: What Have We Learned?*, ed. N.L. Rose (NBER and University of Chicago, forthcoming), 11.

¹²⁷ John E. Robson, "Airline Deregulation: Twenty Years of Success and Counting," *Regulation* (Spring 1998): 18.

¹²⁸ Severin Borenstein and Nancy L. Rose, "How Airline Markets Work...Or Do They?," In *Economic Regulation and Its Reform: What Have We Learned?*, ed. N.L. Rose (NBER and University of Chicago, forthcoming), 11.

¹²⁹ T.A. Heppenheimer, *Turbulent Skies: The History of Commercial Aviation*. (New York: John Wiley & Sons, 1995), 319.

carriers, major carriers began offering their own discount fares which were now approved by the CAB.¹³⁰

In 1977, President Jimmy Carter appointed economist Alfred Kahn to head of the CAB. Kahn had studied and researched regulation of telephone and electricity markets, and he began to make administrative reforms at the CAB so that market outcomes were preferred over regulation.¹³¹ In October 1978, President Carter signed the Airline Deregulation Act into law in large part due to Senator Kennedy and Alfred Kahn. This act phased out the CAB's regulatory oversight by January 1983 and eliminated the Board by 1985 (Borenstein and Rose 2013: 12).¹³² Interestingly, one regulatory aspect remained intact was the Essential Air Services which provided subsidies and oversight to small communities; this program was planned to be phased out in the 1980s, but the program still exists today due to continuous political pressures to maintain access to air travel for small population centers. With President Carter's approval, the CAB quickly began to implement the reforms to encourage industry decision-making by market forces. Deregulation provided many expected results as well as surprises.

B. Motivations for Deregulation

Although regulation had provided industry stability and technological innovation, it led to market inefficiencies which prompted economic studies. First, evidence began to show that unregulated intrastate markets (e.g. California and Texas) had lower fares and higher service.¹³³ Using California's Los Angeles-San Francisco as a test case, Levine 1965 argued that "The economic evils which the air transport industry and its regulators fear will occur without

¹³⁰ Ibid.

¹³¹ Ibid, 318.

¹³² Severin Borenstein and Nancy L. Rose, "How Airline Markets Work...Or Do They?," In *Economic Regulation and Its Reform: What Have We Learned?*, ed. N.L. Rose (NBER and University of Chicago, forthcoming), 12.

¹³³ Andrew R. Goetz and Timothy M. Vowles, "The Good, the Bad, and the Ugly: 30 Years of US Airline Deregulation," *Journal of Transport Geography* 17, (2009): 253.

regulation have not materialized".¹³⁴ Second, some economists began to argue that the airline industry had neither significant economies of scale nor barriers to entry which were usually used as reasons to regulate industries.¹³⁵ An industry with large economies of scale can result in natural monopoly because the monopolist must produce a large quantity to supply the market in order to not earn negative profits; if another firm entered the market and split the output, neither firm would be able to earn profits and both would exit the market leaving consumers without the product. Economies of scales can act as a barrier to entry since a firm must produce a minimum level of output before it can earn non-negative profits. Without economies of scale or barriers to entry, the industry no longer needed regulation to prevent natural monopoly power from developing.

Closely tied to the argument of economies of scale and barriers to entry, a third argument in support of deregulation lay in the theory of contestable markets with economists such as Elizabeth Bailey and William Baumol as strong proponents. Unlike perfect competition, contestability implies that a large number of firms is not necessary to ensure that firms do not earn monopolistic rents from consumers. If a market has low barriers to entry and exit and no sunk costs, contestability says that a market with one or few firms may approximate perfect competition because just the *threat* of a new entrant will ensure that the firm(s) will act in a competitive manner. In an unregulated airline industry, a carrier could easily enter a profitable city-pair market by just moving a plane to this route, and simply this threat of entry promotes competitive prices on a route controlled by a single carrier. A few years after deregulation, Bailey and Panzar 1981 stated "airline markets are basically contestable" and "In a *perfectly*

¹³⁴ Michael E. Levine, "Is Regulation Necessary? California Air Transportation and National Regulatory Policy," *Yale Law Journal* 74, no.8 (July 1965):1439.

¹³⁵ Andrew R. Goetz and Timothy M. Vowles, "The Good, the Bad, and the Ugly: 30 Years of US Airline Deregulation," *Journal of Transport Geography* 17, (2009): 253.

contestable natural monopoly market, actual entry is redundant. The mere threat of entry will discipline the market even if it is a natural monopoly”.¹³⁶ Deregulation brought an end to the CAB’s authority to regulate market entry and exit which was important for the contestability theory. The idea that potential competition in a market produced the same economic results as actual competition remained an untested theory which had its opponents. Finding evidence of a middle ground, Morrison and Winston 1987 concluded that airlines are not perfectly contestable but may be imperfectly contestable, meaning potential competition may still affect welfare.¹³⁷

After economists began to support deregulation as way to improve economic welfare, politicians like Senator Edward Kennedy voiced support for airline deregulation using economists’ arguments. Supporters of deregulation argued that it would improve consumer welfare with lower fares and better service as carriers faced competition from other incumbents and new entrants to the market. In the next section, the post-deregulation reality will be discussed in some detail to demonstrate that deregulation was largely successful but had unexpected consequences as well.

IV. Post-Deregulation Experience

Regulation of the airlines ensured a stable industry where the government controlled fares, routes, entry and exit, and safety standards. The CAB sought to provide airlines with a fair rate of return and passengers with a safe and reasonably priced mode of travel. However, when economists and politicians began to see the benefits of a deregulated airline industry, the legislation to promote competitive forces in the industry was passed spawning a wave of deregulation in other industries as well. Deregulation had many consequences, some that were

¹³⁶ Elizabeth E. Bailey and John C. Panza, “The Contestability of Airline Markets During the Transition to Deregulation.” *Law and Contemporary Problems* 44, no.1 (Winter 1981): 145.

¹³⁷ Steven A. Morrison and Clifford Winston, “Empirical Implications and Tests of the Contestability Hypothesis,” *Journal of Law and Economics* 30, (1987): 59.

expected and others unexpected. This section is devoted to briefly discussing what happened to the airline industry since deregulation 35 years ago in terms of the economic successes (or failures) as described by academics and as demonstrated by the industry statistics for a more visual understanding.

A. Route Structures

Under regulation, the CAB strictly controlled which carriers could enter or exit a route. One of the first surprises of deregulation is how carriers quickly moved from point-to-point network configurations to hub-and-spoke networks. Although hub-and-spoke networks existed prior to deregulation, more carriers moved to this more efficient system as competition began to push airlines to find ways to improve their operations. The hub-and-spoke network allows airlines to funnel passengers from different cities with the same final destination on to the same flight to the destination from a hub airport. One measure of the industry's efficiency is load factor which is the percentage of seats on a flight filled by revenue-paying customers. Because the marginal cost of carrying an additional passenger is close to zero until the plane is full, carriers desire to fill the plane to capacity to maximize profits. In 1970, the industry's load factor was only 48.5 percent which was a warning sign of the inefficiencies of the industry created by regulation. Although the industry load factor was trending upwards prior to regulation, the trend has continued to rise to all-time highs. In 1978, the load factor was 61.5 percent, but in 2010, it reached an unprecedented 82.1 percent. Even though the load factor dropped temporarily following the 9/11 terrorist attacks in 2001, airlines over the past decade have found better ways to fill planes raising the industry load factor by over 12 percentage points between 2001 and 2010. Figure 1 below illustrates the annual industrywide load factor and highlights 1978 and 2001.

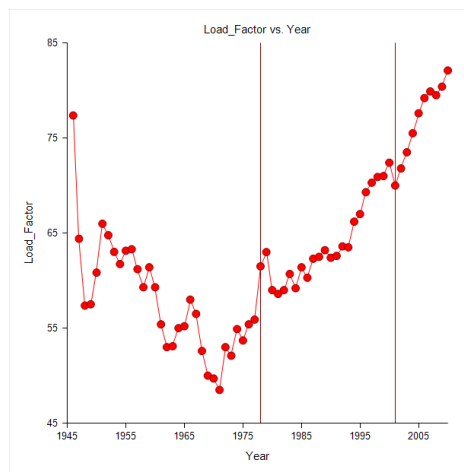


Figure 1 - Data from Various Airlines for America Annual Economic Reports

The efficiency gains by the airlines as demonstrated with increased load factors has contributed to the decrease in fares (discussed below), but hub-and-spoke systems also allowed carriers to increase schedule frequency which improved consumer welfare even more. Morrison and Winston 1995 estimated the benefits of increased frequency relative to frequency pre-deregulation to be \$15.2 billion in 2013 dollars.¹³⁸ However, one of consumers' biggest complaints of these networks is the need for connecting flights. Morrison and Winston 1995 found that this complaint was unfounded: 28 percent of passengers changed planes in 1978 and 32 percent of passengers changed planes in 1993.¹³⁹ Similarly, Borenstein and Rose 2013 report that after adjusting for trip distance (since the need for connection is greater for longer trips), "a substantially smaller share of customers changed planes in 2011 than in 1979".¹⁴⁰ Passengers have also benefited as the need to change airlines has decreased as well. Changing airlines increased the probability of missing connections and lost luggage; when making a connection within an airline, the carrier's schedule is designed to allow for passengers connecting from

¹³⁸ Steven A. Morrison and Clifford Winston, *The Evolution of the Airline Industry*. (Washington, D.C.: Brookings Institution, 1995), 20.

¹³⁹ *Ibid*, 22.

¹⁴⁰ Severin Borenstein and Nancy L. Rose, "How Airline Markets Work...Or Do They?," In *Economic Regulation and Its Reform: What Have We Learned?*, ed. N.L. Rose (NBER and University of Chicago, forthcoming), 26.

various cities to make the connecting flight, unlike making connections across carriers. The percentage of trips requiring a change in airlines has decreased from 11.2 percent in 1978 to just 1.2 percent in 1990.¹⁴¹

Although hub-and-spoke networks have contributed to the lower fares with efficiency gains, they have also led to “fortress hubs” at which single carriers exert market power. Borenstein 1989 states that “dominance of major airports by one or two carriers, in many cases the result of hub formation, appears to result in higher fares for consumers who want to fly to or from these airports,” but “the market power of a dominant airline does not spill over substantially to other airlines serving the same airport or routes”.¹⁴² Carriers have used marketing strategies including frequent flyer programs, travel agent commission override bonuses (TACOs), and biases in computer reservation systems owned by carriers to increase their market share at hub airports.¹⁴³ Also, dominant carriers at congested airports may prevent competitors from entering or expanding operations at an airport by limiting gate access.¹⁴⁴ Overall, the advantages of hub-and-spoke networks seem to outweigh the disadvantages for both passengers and carriers.

B. Price Competition

Prior to deregulation, the CAB controlled the fares at which airlines could charge forcing them to compete on other attributes such as schedule frequency and in-flight service and food quality; today, airlines primarily compete on price. After deregulation, the industry witnessed several waves of new entrants followed by mergers and acquisitions as new carriers tried to capture market share and legacy carriers used their market power to fight back. The number of

¹⁴¹ Severin Borenstein, “The Evolution of U.S. Airline Competition,” *Journal of Economic Perspectives* 6, no. 2 (Spring 1992): 50.

¹⁴² Severin Borenstein, “Hubs and High Fares: Dominance and Market Power in the U.S. Airline Industry,” *Rand Journal of Economics* 20, no. 3 (Autumn 1989): 362.

¹⁴³ *Ibid.*

¹⁴⁴ *Ibid.*, 345.

competitors in a market is a key determinant of the price of the airfare. Although the simple economic model suggests that more carriers (i.e. more competition) would lead to lower prices, this does not consider that airlines compete head-to-head at the route level, not on a national scale. Morrison and Winston 1995 found that even though there were fewer effective carriers at the national level after deregulation, the level of carrier competition has not decreased and “at the route level airlines are clearly more competitive than they were under regulation”.¹⁴⁵ They found that deregulation has led to fares being 22 percent lower than they would have been under regulation on average and has saved flyers about \$18.3 billion in 2013 dollars per year.¹⁴⁶ However, the decreases in fares were not spread evenly across all flights. Prices on longer routes fell more, and on shorter routes which had been cross-subsidized under regulation, the fares decreased by less or even increased on some routes.¹⁴⁷

As seen in Figure 2 below, the number of effective competitors on routes increased following deregulation and then became relatively stable since the mid-1980s with some variation due to economic cycles. As noted above, passengers flying on longer routes saw their fares decrease as the number of effective competitors increased on those routes, but passengers on shorter routes faced lower decreases or even some increases which can be explained by the relatively lower increase (and recently decrease) in number of effective competitors on shorter routes. Morrison and Winston note that level of competition on a route is not only determined by

¹⁴⁵ Steven A. Morrison and Clifford Winston, *The Evolution of the Airline Industry*, (Washington, D.C.: Brookings Institution, 1995), 9-10.

¹⁴⁶ *Ibid*, 13.

¹⁴⁷ Severin Borenstein, “The Evolution of U.S. Airline Competition,” *Journal of Economic Perspectives* 6, no. 2 (Spring 1992): 47.

the number of competitors but also by the “identity” of carriers (i.e. low cost carriers).¹⁴⁸ Thus, the fares may decrease by more on a route if a low cost carrier enters relative to another carrier.

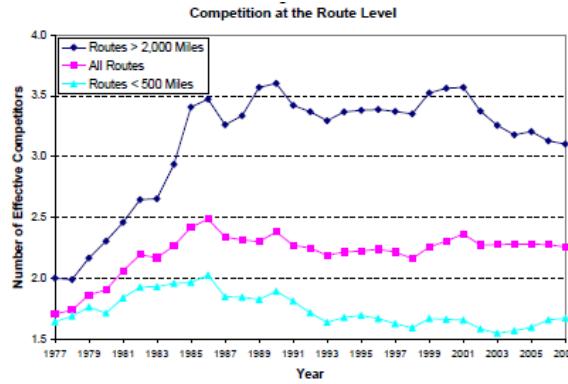


Figure 2 - Morrison, Steven A., and Clifford Winston, “The State of Airline Competition and Prospective Mergers”, testimony April 24, 2008, 4.

Another way to see the effects of deregulation on airfares is to consider the passenger yield which is a measure of average fare per mile per passenger. Figure 3 below illustrates the industry passenger yield in 2013 cents. Again, the trend before deregulation was a decline, but this downward trend has continued for the past 35 years. In 1978, the passenger yield was 23.5¢ and 12.7¢ in 2009 (constant 2013 dollars). The decline in passenger yield provides more evidence that on average airfares have declined since deregulation.

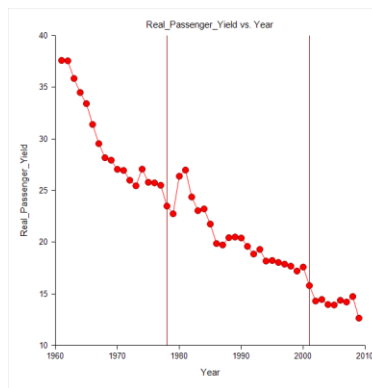


Figure 3 - Data from Various America for Airlines Annual Economic Reports

¹⁴⁸ Morrison, Steven A., and Clifford Winston, “The State of Airline Competition and Prospective Mergers,” testimony, April 24, 2008 before the U.S. House of Representatives Judiciary Committee Antitrust Task Force on *The State of Airline Competition and Prospective Mergers*. 1.

One of the biggest surprises of deregulation was the variation in prices paid by customers on the same route, or price dispersion. When airlines began to compete on price in addition to service quality, they found clever ways to charge different prices to customers with different elasticities (i.e. price discrimination). Consumers are well-aware of the benefits of buying tickets far-in-advance or staying at the destination over a Saturday night as airlines have found that business travelers and leisure travelers, who are more price sensitive, reveal their preferences when purchasing. To price discriminate, three market conditions must exist: 1.) the firm must have some level of market power in order to charge above marginal cost, 2.) the customers must be heterogeneous (i.e. have different price elasticities) and carriers must be able to distinguish between them, and 3.) to avoid arbitrage, the customer must not be able to resell the product.¹⁴⁹ Although consumers with lower price elasticities face higher fares, price discrimination in theory does not lead to a less efficient outcome. Instead, there is an exchange of surplus from consumers to producers. In the airline industry, Stavins 1996 found that price discrimination decreases with market concentration and “even when carriers face competition on a route, they effectively compete only for the price-elastic segment of the market, while retaining market power in the other market segment. As a result, the more competitive routes have more price discrimination”¹⁵⁰.

Although the topic of price discrimination by the airlines is a common complaint, the wide range in prices paid by passengers on the same flights (i.e. price dispersion) can be explained by price discrimination or cost differences. It might not seem obvious that the cost of providing a seat on a flight to one passenger pay cost more than another, but a business travel may pay a higher price because they demand more frequent service (thus higher costs to the

¹⁴⁹ Joanna Stavins, November 25, 1996, “Price Discrimination in the Airline Market: The Effect of Market Concentration,” *Federal Reserve Bank of Boston Working Paper 1996 Series*, 3.

¹⁵⁰ *Ibid*, 15.

airlines).¹⁵¹ The variation in airfares paid by customers on the same flight is one example of an unexpected consequence of deregulation.

C. Service Attributes

One of the major objections to deregulation was how competitive forces would affect the safety of flying even though the FAA would continue to regulate safety after economic regulation was phased out. People feared that as airlines' profits fell, the carriers would cut costs by skimping on necessary maintenance or hiring less qualified pilots; they were also concerned that commuter airlines with worse safety records would replace the larger airlines in smaller cities.¹⁵² Despite these safety concerns, "virtually all measures of accident or fatality risk suggest that the long-term trend toward increased airline safety has continued since economic deregulation".¹⁵³ According to Rose 1991, there was a relative decrease in accidents caused by something under a carrier's control after deregulation.¹⁵⁴ However, Rose 1991 did find some evidence that passengers flying on commuter airlines are at a higher risk, but it is difficult to separate if this is because shorter routes tend to use smaller planes which are more susceptible to mechanical failure or the airports served by commuters have lower quality of navigational aids or have more dangerous flying conditions.¹⁵⁵ After the FAA increased safety regulations on commuter airlines in 1978, safety on commuter airlines greatly improved.¹⁵⁶ Similarly, the public feared that new entrants after regulation would be less safe than the established airlines, but

¹⁵¹ Robert H. Frank, "When Are Price Differentials Discriminatory?," *Journal of Policy Analysis and Management* 2, no.2 (1983).

¹⁵² Steven A. Morrison and Clifford Winston, *The Evolution of the Airline Industry*, (Washington, D.C.: Brookings Institution, 1995), 32.

¹⁵³ Rose, Nancy L. July 1991, "Fear of Flying? Economic Analyses of Airline Safety," *National Bureau of Economic Research Working Paper #3784*, 15.

¹⁵⁴ *Ibid*, 5.

¹⁵⁵ *Ibid*, 18.

¹⁵⁶ *Ibid*, 18-9.

academics have concluded that the safety records of new entrants and established carriers do not significantly differ on a variety of safety metrics.¹⁵⁷

A less obvious way that deregulation affected safety is related to how consumers switched modes of travel as airfares dropped in the wake of deregulation. As fares dropped, people switched from traveling by car on highways to traveling by plane, and this substitution away from the more dangerous automobile transportation has benefited consumers. One estimate is that more than 300 lives are saved annually by shifting to flying.¹⁵⁸

In addition to the FAA's safety regulations for airlines, the carriers have strong incentives to ensure a high level of safety regardless of regulations. If a carrier has a poor safety record, consumers will avoid this carrier for a carrier with a better safety record. If a carrier had an accident on a flight, the airline would be responsible for damages to the passengers hurt or killed, and carriers with a lower safety record would face higher insurance costs. According to Crandall and Winston 2008, "the market, and in some cases the liability system, provide sufficient incentives for firms to behave in a socially beneficial manner" and that since the FAA will never have the same level of information as the airlines do regarding best safety practices, the regulator will always remain behind the airlines in promoting safety.¹⁵⁹

Another service attribute that is of high-importance to consumers is on-time performance of airlines. Flight delays and cancellations have many causes including weather which is generally beyond a carrier's or air traffic control's control, airline's scheduling and availability of equipment and personnel, and inefficient infrastructure investment and utilization policies.¹⁶⁰

¹⁵⁷ Ibid, 15.

¹⁵⁸ Ibid, 10.

¹⁵⁹ Robert W. Crandall and Clifford Winston, "Airlines are Safer than Ever," *Wall Street Journal*, April 19, 2008, accessed via <http://www.brookings.edu/research/opinions/2008/04/19-airlines-winston>.

¹⁶⁰ Severin Borenstein and Nancy L. Rose, "How Airline Markets Work...Or Do They?," In *Economic Regulation and Its Reform: What Have We Learned?*, ed. N.L. Rose (NBER and University of Chicago, forthcoming), 29.

The discussion of on-time performance will be continued under the Infrastructure Implications section.

D. Non-Price Competition

After deregulation, hub-and-spoke networks pushed airlines toward a new, more complex fare structure; with the help of computer reservation systems, carriers began to find ways to price discriminate on customers with different price elasticities. However, carriers also changed their marketing schemes with new ideas like frequent flyer programs which rewarded repeat customers with free flights or seat upgrades. These brand loyalty programs provided carriers with a way to regain market power. When making a travel decision today, a customer is more likely to purchase a ticket from the airline he is more likely to fly with in the future. In other words, “Loyalty programs soften price competition across carriers, as they induce a switching cost for travelers (or travel agents) by raising net cost if travel is spread over several airlines rather than concentrated on a single airline over time”.¹⁶¹ Frequent flyer programs provide particular advantage at airports where the carrier has a large market share.¹⁶²

Although the use of travel agents has declined dramatically in the last decade, airlines turned to travel agents who used carrier-owned computer reservation systems to book tickets. Airlines would increase the commission rates for travel agents who met a specified sales target with a particular airline so travel agents had an incentive to direct their customers towards the airline with whom they had a contract. These TACOs (Travel Agency Commission Overrides) gave carriers strategic advantages and helped to increase market share in cities where travel agents could push customers to a particular carrier. However, as computer technology has advantage, the almost ubiquitous access to the internet in the US has allowed for airlines and

¹⁶¹ Ibid, 19.

¹⁶² Bailey, Elizabeth E., “Airline Deregulation: Confronting the Paradoxes,” *Regulation* (Summer 1992): 20.

consumers to bypass travel agents over the last decade. Between 1977 and 1989, the percentage of airlines' operating expenses on commissions increased from 4.05 percent to 11.35 percent, but this number reached a peak in 1993 of 11.97 percent and crashed down to 1.45 percent in 2005.¹⁶³ As Figure 4 illustrates, the need for airlines to provide travel agents with incentives to direct customers in their direction has declined quickly. Today, airlines can sell tickets directly to consumers of their own websites preventing the need for middlemen in travel agents and saving both themselves and passengers money.

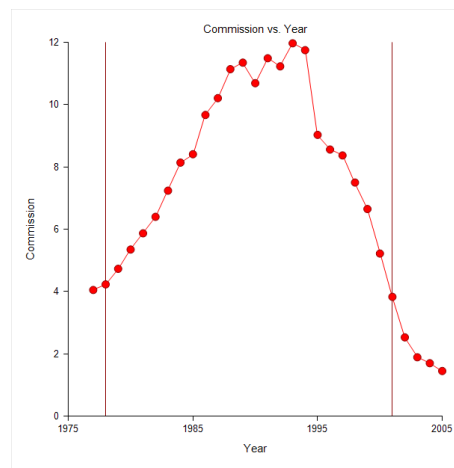


Figure 4 - Data from Adam M. Pilarski, *Why Can't We Make Money in Aviation?* (Burlington, VT: Ashgate, 2007), 56.

E. Infrastructure Implications

The development of the US airway infrastructure occurred over the 20th century during which the country experienced multiple wars, economic recessions and expansions, and unforeseeable advances in technology. All these factors influenced how the airline industry and the national air travel infrastructure grew, and with the overall economic and population growth of the US over the past century, the growth of air travel, too, is no surprise. To distinguish the causal effects of air travel growth due to deregulation or various other factors such as globalization is a difficult and probably impossible task, but the decrease in average fares and

¹⁶³ Adam M. Pilarski, *Why Can't We Make Money in Aviation?* (Burlington, VT: Ashgate, 2007), 56.

increase in flight options resulting from deregulation probably has had a significant positive effect on the continued growth of air travel in the US. Many measures can help provide a clear picture of this growth of the airline industry. First, the number of passenger enplanements is simply the number of passengers who boarded scheduled service flights. Between 1947 and 1977, the number of passenger enplanements increased from 14.3 million passenger enplanements to 240.3 million, or by 7.9 million per year on average. After deregulation in 1978 through 2010, this number increased from 274.7 million to 720.5 million, or by 16.0 million per year on average. Figure 5 illustrates the change in growth rate after deregulation, but this increase can be attributed to many factors in addition to deregulation. The disadvantage of using passenger enplanements to look at the growth of the industry is that it does not factor in the increase mileage flown with the increase in number of passengers.

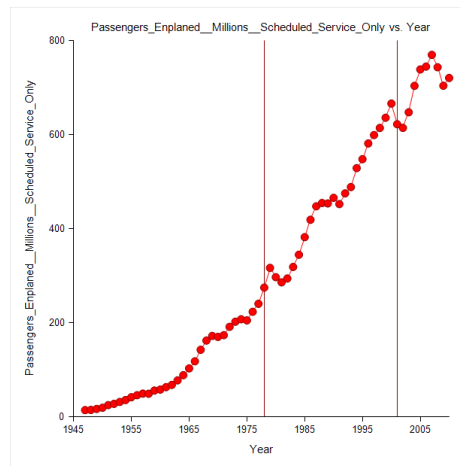


Figure 5 - Data from various America for Airlines Annual Economic Reports

Next, to adjust for the increase mileage flown by passengers, the revenue passenger miles (RPMs) are analyzed. RPMs are simply the number of revenue passengers multiplied by the number of miles flown (one RPM is created when one passenger flies one mile). Similarly to passenger enplanements, the growth rate of RPMs increased after deregulation. Between 1955 and 1977, RPMs rose from 24.4 billion to 193.2 billion, or by 8.3 billion per year on average.

Between 1978 and 2010, RPMs increased from 226.8 billion to 798.0 billion, or by 19.8 billion per year on average.

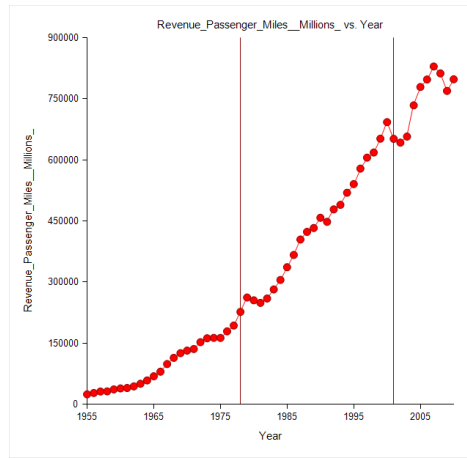


Figure 6 - Data from various America for Airlines Annual Economic Reports

More people fly and fly farther than they used to, and these trends have implications for on-time performance given limited air traffic control capacity especially at chronically congested airports such as Newark International, LaGuardia, and Kennedy in the New York metropolitan area. In 2011, 40 of 100 most delayed flights departed or arrived into Newark.¹⁶⁴ In May 2008, the FAA set caps for the number of flights per hour at JFK and Newark airports to help reduce congestion and delays stemming from these airports. In 1988, about 20 percent of all flights arrived more than 15 minutes past scheduled arrival time, but this number reached 27 percent in 2000 even though airlines have begun to “pad” scheduled flight times.¹⁶⁵ Because airlines operated in a highly interconnected network, delays at one airport can create more delays which can spread further through the network. As air traffic capacity is reached at major airports, delays will inevitably spread beyond the congested airport, and the costs of flying will increase unless improvements are made to the current system. As seen in Figure 7, the number of departures per

¹⁶⁴ Scott McCartney, “The One Airport to Avoid Is...,” *Wall Street Journal*, August 4, 2011.

¹⁶⁵ Severin Borenstein and Nancy L. Rose, “How Airline Markets Work...Or Do They?,” In *Economic Regulation and Its Reform: What Have We Learned?*, ed. N.L. Rose (NBER and University of Chicago, forthcoming), 29.

year has been increasing, indicating the need for air traffic control capacity to expand in line in order to minimize delays for customers. According to Borenstein and Rose 2013, “Airport congestion and flight delays, which are among the most visible and significant declines in service quality, may be attributed more to the success of deregulation in increasing traffic and to the failure of infrastructure policy to keep pace with traffic growth than to altered carrier decisions under economic deregulation”.¹⁶⁶

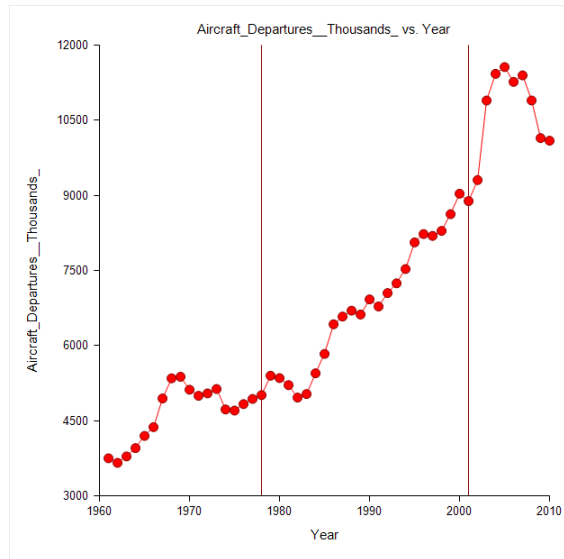


Figure 7 - Data from Various America for Airlines Annual Economic Reports

F. Carrier Financial Performance

Academics seem to conclude that consumers have benefited tremendously from deregulation, but the industry as a whole has struggled to earn profits without the stability provided by regulation. Between 1955 and 1978, the industry averaged a net profit margin of 2.81 percent with a standard deviation of 2.27 and did not experience a negative net profit margin during that period. Between 1979 and 2010, the average net profit margin was -0.34 percent with a standard deviation of 5.74. Clearly, deregulation resulted in a more competitive

¹⁶⁶ Ibid, 25.

and volatile industry. Figure 8 displays annual net profit margins between 1955 and 2010. Before deregulation, the industry earned stable positive returns, but soon after 1978, the industry faced the oil crisis which was the beginning of instability. During the economic downturn in the early 1990s, the industry struggled as well, but soon recovered as the economy began to grow in the late 1990s. However, 2001 reflects another turning point where the volatility of the net profit margins increased dramatically: the net profit margin in 2002 was -10.6 percent, 6.8 percent in 2004, -18 percent in 2005, 11 percent in 2006, and -12.8 percent in 2008. While much of the variation can probably be explained by the 9/11 terrorist attacks and the global financial crisis in 2008, the ability of the industry to sustain itself in the face of high uncertainty is unclear. Real Operating Profits show a similar story in Figure 9. This quick analysis of US carriers financial performance pre- and post- deregulation provides clues that regulation secured stable returns for carriers and that deregulation exposed the industry to competitive forces which created instability and tied the industry’s performance closely to the national and global economic climate.

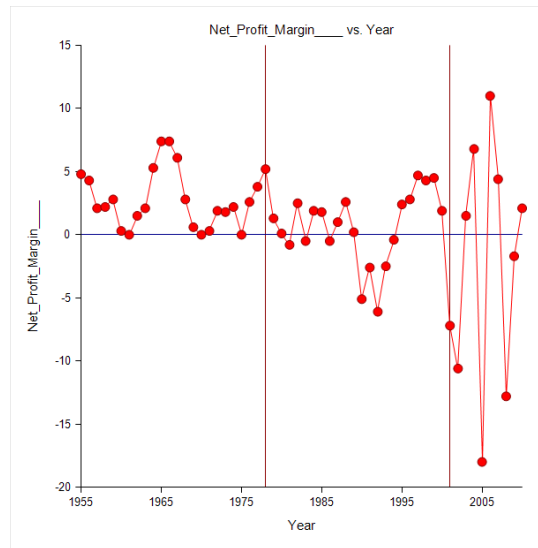


Figure 8 - Data from Various America for Airlines Annual Economic Reports

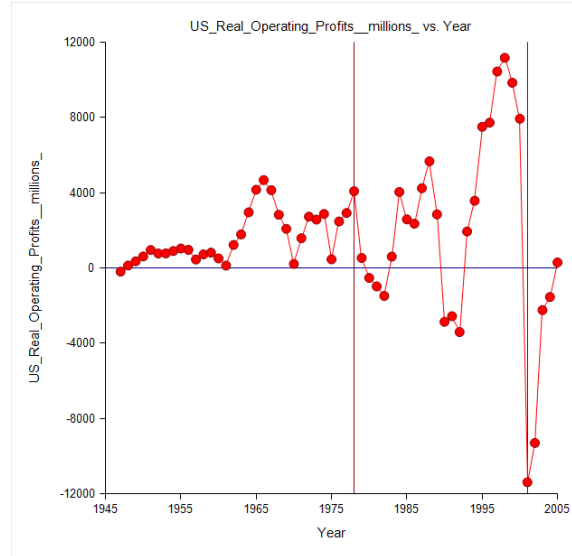


Figure 9 - Data from Adam M. Pilarski, *Why Can't We Make Money in Aviation?* (Burlington, VT: Ashgate, 2007), 18.

G. Market Entry, Exit, and Firm Consolidation

As discussed above, the regulated airline industry remained largely stable with carriers such as American, Delta, Pan Am, TWA, and United dominating the interstate markets. The CAB had prevented carriers from entering markets occupied by other incumbent carriers and rarely did carriers merge. Since deregulation in 1978, the industry has faced a series of waves of entry and exit which continues to the present day. In the first five years or so following deregulation, a wave of new entrants entered into the interstate airline market challenging the established legacy incumbent carriers. These new entrants included previous local and regional carriers (e.g. Frontier, Republic, US Air), intrastate airlines (e.g. Air California, Southwest), charter airlines (e.g. ATA, Capitol), and new airlines (e.g. Midway, New York Air, PEOPLExpress). Between 1978 and 1985, industry reached an all-time low concentration at 82

percent for the 10-firm ratio and 46 percent for the 4-firm ratio.¹⁶⁷ However, the original trunk carriers began to respond to the new competition over the next decade.

After a series of mergers and acquisitions and bankruptcies, the original trunk airlines regained much of their previous market share by 1991 with concentrations reaching 97 percent for the 10-firm ratio and 69 percent for the 4-firm ratio.¹⁶⁸ Major established airlines such as Braniff, Eastern, and Pan Am went bankrupt, and Delta acquired Western. The remaining large carriers (American, Continental, Delta, Northwest, United, and US Air) used acquisitions, alliances with regional and commuter airlines, control of airport gates and slots, and new marketing techniques such as computer reservation systems owned by the carriers themselves, frequent flyer programs, and TACOs to regain market share.¹⁶⁹ The advantages of the large carriers allowed them to regain market control in the late 1980s and early 1990s, but during the mid-1990s, the industry faced another waves of entrants such as JetBlue and ValuJet/AirTran recapturing some market share.

During the late 1990s, the US economic expansion and increased demand for air travel allowed for the major airlines to regain some market power briefly. However, the industry has faced a high level of instability since 2000. According to Goetz 2009, the 9/11 terrorist attacks and the subsequent four-day shutdown, drop in demand with the economic recession, increased security restrictions, the SARS scare, growing concerns of war in Afghanistan and Iraq, and increasing fuel costs have contributed to the industry's decade or so of instability.¹⁷⁰ The legacy carriers were hit particularly hard with Delta, Northwest, United, and US Airways filing for

¹⁶⁷ Andrew R. Goetz, "Deregulation, Competition, and Antitrust Implications in the US Airline Industry," *Journal of Transport Geography* 10, (2002): 13.

¹⁶⁸ Ibid.

¹⁶⁹ Andrew R. Goetz and Timothy M. Vowles, "The Good, the Bad, and the Ugly: 30 Years of US Airline Deregulation," *Journal of Transport Geography* 17, (2009): 254.

¹⁷⁰ Ibid.

bankruptcy by 2002, American’s acquiring TWA in 2001, and merging of US Airways and America West in 2005.¹⁷¹ While the legacy carriers have struggled, low-cost carriers such as Southwest and JetBlue have been profitable during this tumultuous period, but the industry as a whole has been hurt by rising fuel prices. Figure 10 below shows Southwest’s Net Profit Margins relative to the Industry’s Net Profit Margins; Southwest has been able to consistently earn positive profit margins even during economic recessions. Although Southwest’s profit margins have fallen since its services began in the early 1970s, this carrier has outperformed the industry except for a few years in the highly volatile post 9/11 period. However, the convergence of the two time series may suggest that the industry has begun to find ways to compete with Southwest.

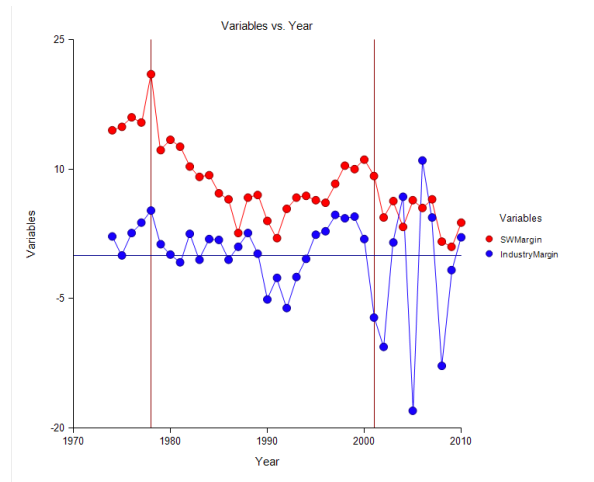


Figure 10 - Data from Various A4A Annual Economic Reports and Various Southwest Airlines Company Reports

V. Policy Implications

A. Consumer Mobility and Satisfaction

In just over a century, the airline industry dramatically changed how people travel both across the country and overseas. More recently, deregulation helped to accelerate the growth of

¹⁷¹ Ibid.

the industry. As noted above, a vast array of retail metrics illustrates the growth of the industry since 1978. As competitive forces have pushed airfares downwards, flying has become more affordable for more people. During the first decades of the airline industry, only wealthy Americans could afford to travel by plane even though comfort did not improve until cabin pressurization was introduced in 1937. Larger planes with more powerful engines allowed for economies of scales and lower fares, but regulation prevented the industry from finding cost-reducing efficiencies. Deregulation brought fares down on average especially on longer flights which has greatly benefited consumers. While shorter routes saw smaller decreases and even some increases, these routes had been cross-subsidized by more profitable longer routes under regulation. Passengers on these routes now pay closer to the true cost to the carrier. Figure 11 shows that passengers are flying farther on average than ever before. Today, the overall decreases in airfares have opened the skies to almost all Americans.

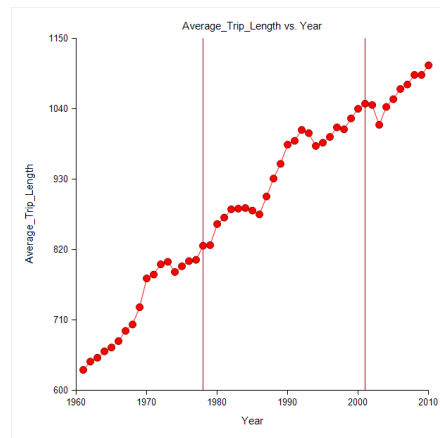


Figure 11 - Data from Various America for Airlines Annual Economic Reports

In addition to the benefits of decreased fares for consumers, airlines are flying more frequent schedules providing consumers with more flexibility in their travel plans. The growth of hub-and-spoke networks after deregulation as airlines sought efficiencies gains have also provided consumers with more travel options. If a passenger departing Boston to Los Angeles

cannot make the direct flight, carriers have multiple other flights flying to Los Angeles via other hubs where the passenger can make a connecting flight. Scheduling flexibility with hub-and-spoke networks has greatly benefited consumers.

Although passenger complaints about the minimal service and crowded flights seem common today, the growth of low-cost carriers such as Southwest and JetBlue provide contradictory evidence. With LCCs, consumers trade lower fares for reduced amenities and comfort, and their growth suggests that passengers are willing to sacrifice these luxuries to save money. The increase in load factors indicates that flights are more crowded, but it also means that airlines have found ways to improve efficiency which in turn leads to lower fares. In an effort to earn the business of both types of passengers, carriers offer (at additional cost) extra amenities such as roomier seats and better quality food and beverages for passengers who want a higher level of service. Overall, consumers today have lower fares and more flight options with the availability of extra comfort for purchase than under regulation.

B. Aggregate Economic Welfare

The ultimate measure of deregulation's economic success is the change in aggregate welfare. Relative to pre-deregulation, more consumers are flying today than ever before in the history of commercial aviation. In 1950, the industry carried about 19.2 million revenue passengers, but in 2010, the airlines flew over 720 million revenue passengers. Table 1 shows the annual revenue enplanements at the start of each decade. The equilibrium quantities have clearly grown rapidly over the past sixty years with the most significant growth after deregulation.

Table 1 - Data from Various America for Airlines Annual Economic Reports

| Year | Passengers Enplaned (Millions) |
|------|--------------------------------|
| 1950 | 19.2 |
| 1960 | 57.9 |
| 1970 | 169.9 |
| 1980 | 296.9 |
| 1990 | 465.6 |
| 2000 | 666.1 |
| 2010 | 720.5 |

Today, consumers have greatly benefited from lower airfares improving their economic welfare as they are able to travel to more locations around the world for lower prices. At the end of the regulated era in 1978, the passenger yield was 23.5¢. Since deregulation, the passenger yield has declined to 12.7¢ in 2009 (constant 2013 dollars) as airlines have found efficiencies. According to Morrison and Winston 1995, the 22 percent decrease in average fares due to deregulation has led to an annual \$18.3 billion (constant 2013 dollars) welfare gain by consumers.¹⁷² Not only have consumers benefited from lower prices, they have gained from the increase in flight frequency which resulted as airlines moved to the more efficient hub-and-spoke network configuration. Morrison and Winston 1995 calculated that consumers have benefited \$15.2 billion (constant 2013 dollars) from the increased flight frequency relative to pre-deregulation.¹⁷³ Overall, consumers have experienced a substantial increase in their economic welfare as declining prices have allowed more people to fly to more destinations around the world.

C. Fiscal Considerations

The growth of air travel has begun to strain the national airspace capacity as the current air traffic control system developed in the 1960s can only handle a certain level of air traffic. To

¹⁷² Steven A. Morrison and Clifford Winston, *The Evolution of the Airline Industry*, (Washington, D.C.: Brookings Institution, 1995), 9-10.

¹⁷³ *Ibid*, 20.

accommodate projected passenger growth, the FAA has begun to upgrade the national air traffic control system which uses radar tracking with global positioning satellites with the Next Generation Air Transportation System (NextGen). According to the FAA, NextGen uses satellite and digital technologies along with new procedures to improve air travel in a variety of ways: “NextGen efficiency enhances safety, reduces delays, saves fuel and reduces aircraft exhaust emissions”.¹⁷⁴ With a modernized ATC system, planes will be able to fly more direct routes which will decrease flight times and save on fuel costs. The FAA estimates that the cumulative benefits between 2012 and 2030 will be \$47 billion in aircraft direct operating costs and \$107 billion in passengers’ value of time in terms of delays, \$5.9 billion in reduced flight time, \$3.4 billion in fewer flight cancellations, \$379 million in reduced CO₂ emissions, and \$17.7 billion in other savings such as safety improvements and FAA cost savings.¹⁷⁵ Overall in that period, the FAA projects that NextGen will result in \$3.50 in benefits for every \$1 invested.¹⁷⁶

Despite the high expected long-term returns from the NextGen investment, the implementation is behind schedule: for example, the En Route Automation Modernization (ERAM) program is four years behind schedule and \$330 million over budget.¹⁷⁷ Although NextGen has no opponents in Congress, White House, or the industry, the delays in the FAA’s implementation has threatened the success of the highly important modernization program. While US taxpayers are covering \$27 billion, airlines are expected to invest over \$10 billion to prepare for NextGen, but the airlines have become concerned about making expensive investments while the FAA remains behind schedule because they fear that by the time NextGen

¹⁷⁴ “The Business Case for the Next Generation Air Transportation System: FY 2013,” *Federal Aviation Administration: Next Gen*, accessed on February 19, 2014, http://www.faa.gov/nextgen/media/Business_Case_for_NextGen_2013.pdf.

¹⁷⁵ *Ibid.*

¹⁷⁶ *Ibid.*

¹⁷⁷ Ashley Halsey III, “NextGen Air Traffic Control System Behind Schedule and Over Budget,” *Washington Post*, September 12, 2012.

is operational, the technology will be obsolete.¹⁷⁸ Considering the poor financial conditions of the airlines in the last decade, the investments by the carriers are very risky without government incentives. One idea is to give planes equipped with NextGen priority for landing and take-off, and other planes will be forced to wait to take-off and to land.¹⁷⁹ Another idea is for the federal government to provide the airlines with loan-guarantees so airlines can afford to upgrade their planes immediately and puts the financial risk on the government if the FAA fails to meet its deadlines.¹⁸⁰

NextGen promises to increase airspace capacity which is essential to meet forecasted demand growth in the upcoming decades, but the increases in air traffic control capacity must also be met with additional airport capacity. The two most direct ways to increase airport capacity is to build new runways at already congested airports and to build new commercial airports. Runways, however, require significant lead time for master planning, environmental impact studies, and land acquisition and may take decades to plan and then build.¹⁸¹ In the last forty years, only two major commercial airports have been built: Denver International Airport and Dallas-Fort Worth International Airport. The FAA expects that in the next 20 to 30 years that four additional airports will be needed in already congested regions such as Atlanta, Chicago, Las Vegas, and San Diego.¹⁸² Although NextGen will allow for more planes in the national airspace, the new system will also help reduce congestion at airports will help counteract this increase. In order to meet the expected growth of air travel demand, the US

¹⁷⁸ Ashley Halsey III, "New Guidance System for Skies Could Face Delays," *Washington Post*, July 3, 2011.

¹⁷⁹ *Ibid.*

¹⁸⁰ *Ibid.*

¹⁸¹ "Capacity Needs in the National Airspace System 2007-2025: An Analysis of Airports and Metropolitan Area Demand and Operational Capacity in the Future," *Federal Aviation Administration*, accessed on February 19, 2014, http://www.faa.gov/airports/resources/publications/reports/media/fact_2.pdf.

¹⁸² *Ibid.*

government and airlines will need to continue investments into the national airspace capacity via NextGen and airport capacity.

D. Industry Labor Effects

Labor is a very important input into the airlines’ business because carriers need highly-skilled pilots to fly planes, well-trained mechanics to ensure the safety of passengers, and flight attendants who are the public face of the airlines. Given that the airline industry is heavily-unionized, labor costs are neither characterized as variable costs nor fixed costs.¹⁸³ Until recently, labor costs have account for the largest share of airlines’ total costs. Figure 12 shows the cumulative shares of total costs for various components between 1977 and 2005. In 1978, labor costs were about 44 percent of total costs and about 34 percent in 2005.

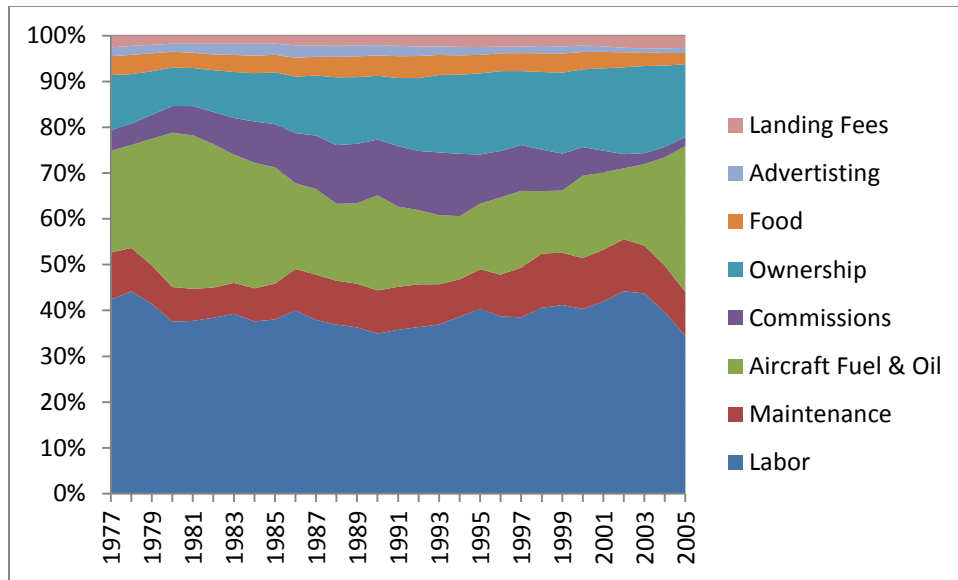


Figure 12 - Data from Adam M. Pilarski, *Why Can't We Make Money in Aviation?* (Burlington, VT: Ashgate, 2007), 56.

During the early 2000s with the severe drop in air travel demand, US Airways, United, Northwest, and Delta fell into bankruptcy which allowed for these carriers to negotiate large

¹⁸³ Severin Borenstein and Nancy L. Rose, “How Airline Markets Work...Or Do They?,” In *Economic Regulation and Its Reform: What Have We Learned?*, ed. N.L. Rose (NBER and University of Chicago, forthcoming), 42.

compensation reductions with its labor unions.¹⁸⁴ Even when airlines are struggling financially, labor unsurprisingly will oppose compensation cuts, but when carriers declare bankruptcy, the court has the authority to impose these labor cuts. However, when airlines are performing better financially, labor tries to capture part of the growing profits, but the multi-year collective bargaining agreements with labor unions prevent immediate redistribution of profits to labor. The stickiness of labor costs for airlines has become a growing concern as a cause of volatility in the industry.

E. Long-Run Sustainability

While deregulation has significantly benefitted consumers, the introduction of competitive forces to the airlines has created an industry characterized by instability. Regulation protected incumbent carriers from new entrants and ensured a fair rate of return; deregulation quickly encouraged established carriers and new entrants to compete on routes and to find innovative ways to improve efficiency and reduce operational costs. The decades following deregulation saw a series of waves of new entrants, followed by exits via bankruptcies and mergers and acquisitions, then by the growth of low cost carriers more recently. As the industry has become more competitive and globalized, the airlines have become highly dependent on the overall state of the economy. This economic linkage makes carriers susceptible to economic recessions such as those in the early 1990s and the Great Recession following the financial crisis of 2009. Since 2001 especially, the industry has become extremely volatile resulting in a new wave of mergers and acquisitions including Delta and Northwest, United and Continental, Southwest and AirTran, and most recently US Airways and American. As the number of carriers has decreased, concerns about the level of competition in industry have grown. Have the

¹⁸⁴ Ibid, 43.

competitive forces from deregulation finally become too destructive for the airlines to continue existing without the need to reintroduce regulation to stabilize the industry?

According to Borenstein and Rose 2013, two theories of “destructive competition” are used to argue that competition is unsustainable in the airline industry.¹⁸⁵ The first theory argues that the industry has high fixed costs and specific assets used to produce a homogenous product and faces highly cyclical demand and frequent price shocks to variable costs, and these conditions lead to underinvestment.¹⁸⁶ The second theory is related to the idea of the “empty core” due to the existence of network and scope economies.¹⁸⁷ The idea of the “empty core” attempts to explain the periodic waves of entries and exits in the industry. The idea that airlines will naturally result in destructive competition was used to support regulation in the early 20th century, but today, “there is little empirical support for either an empty core or natural monopoly characterization of the airline industry”.¹⁸⁸ If the volatile nature of the industry cannot be explained by destructive nature of competition, what else could explain the instability facing airlines?

In an attempt to answer this question, various factors which have been attributed to the volatility of the industry are examined. First, the industry has argued that the high tax burden on airlines cannot be passed on to consumers because of the high levels of competition between carriers. Although the average tax as a percentage of base airfare has doubled since the 1980s from about 8 percent to 16 percent, the average dollar tax per ticket is about the same today as it was in the late 1990s when the industry was earning record profits.¹⁸⁹ Despite the changes of

¹⁸⁵ Ibid, 37.

¹⁸⁶ Ibid, 38.

¹⁸⁷ Ibid, 39.

¹⁸⁸ Ibid, 39.

¹⁸⁹ Severin Borenstein, “Why Can’t US Airlines Make Money?,” *American Economic Review: Papers and Proceedings* 101, no.3 (2011): 233.

how airfares are taxed over the last 30 years, Borenstein 2011 explains that airlines are eventually able to pass through taxes to consumers as the industry adjusts in the long-run which suggests that taxes have probably not been a contributing factor to the industrial instability.¹⁹⁰

Both fuel price increases and volatility have hit airlines especially hard. According to the Air Transport Association, fuel costs have now surpassed labor costs as the largest expense for passenger airlines and the fuel cost per passenger-mile has more than doubled from about 2¢ per RPM in 2001 to 4.06¢ per RPM in 2010.¹⁹¹ Since flight schedules are set, the fuel costs are essentially fixed for the marginal passenger on a flight until the airline changes flight frequency, but carrier faces steep costs of changing schedules even in the face of fuel price shocks.¹⁹² Unable to adjust to quick rises in fuel prices, carriers are unable to pass the cost increases onto passengers in the short-run. Unfortunately, the volatility of fuel prices appears to be a new normal for the industry which will require innovative business ideas such as upgrading to more fuel efficient fleets to counteract rapidly changing fuel prices.

As discussed earlier, the airlines financial conditions have become closely correlated with the overall health of the national and global economy. When a single carrier is struggling financially, the firm can sell their aircraft and equipment on resale markets. However, when all carriers experience a drop in demand, they are unable to recover their “fixed” capital costs.¹⁹³ Although Borenstein 2011 argues that unexpected demand shocks cannot explain weak financial performance prior to 9/11, the article suggests that demand shocks of unprecedented levels following 9/11 and the financial crisis were a major contributor to the large profit losses during

¹⁹⁰ Ibid, 234.

¹⁹¹ “2011 A4A Economic Reports of the U.S. Airline Industry,” Airlines For America, accessed March 31, 2014, <http://www.airlines.org/Pages/A4A-Economic-Reports-of-the-U.S.-Airline-Industry.aspx>.

¹⁹² Severin Borenstein and Nancy L. Rose, “How Airline Markets Work...Or Do They?,” In *Economic Regulation and Its Reform: What Have We Learned?*, ed. N.L. Rose (NBER and University of Chicago, forthcoming), 44.

¹⁹³ Ibid, 41.

the 2000s.¹⁹⁴ Presuming that the demand drops following 9/11 and the financial crisis of 2008 were truly rare and unpredictable events, airlines could not have anticipated the losses of the 2000s.

Another final factor which has arguably contributed to the weakened financial health of the industry is the growth of low-cost carriers. Both LCC incumbents and LCC entrants have been slowly capturing more and more market share from the legacy carriers who once dominated the skies. Between 1994 and 2009, LCCs' market share increased from about 10 percent to about 24 percent, and LCCs compete at over 60 percent of all origin-destination pairs.¹⁹⁵ LCCs have found that customers are more than willing to trade low fares in exchange for a reduction in comfort and other amenities. During the deregulated era, legacy carriers' costs have been 30 to 60 percent higher than LCCs' costs (after adjusting for average flight distance) and 40 percent higher on average in the previous decade.¹⁹⁶ While not every LCC has succeeded since deregulation (e.g. People Express), Southwest has successfully earned consistent profits even during the last highly volatile decade. The competition from LCCs like Southwest has clearly contributed to the losses by legacy carriers even as they use hub domination to restrict gate access, landing slots, and other resources from potential entrants and frequent flyer programs to maintain some market power.¹⁹⁷

Many factors have contributed to the instability of the airline industry including demand shocks, sticky labor and capital costs, volatile fuel costs, and growth of LCCs. The long-run sustainability of the industry and individual carriers will depend on how they adjust to a more unpredictable environment. Legacy carriers may face the choice to either move towards the LCC

¹⁹⁴ Severin Borenstein, "Why Can't US Airlines Make Money?," *American Economic Review: Papers and Proceedings* 101, no.3 (2011): 234.

¹⁹⁵ *Ibid*, 235.

¹⁹⁶ *Ibid*.

¹⁹⁷ *Ibid*, 236.

model or to differentiate their services. Deregulation forced the airlines to adapt to competitive forces. Some suffered, some disappeared, and some have thrived, but clearly, the real winners are consumers who fly to more destinations, more frequently, and for less money.

VI. Forward-Looking Policy Conclusions

For consumers, deregulation has brought substantial benefits over the past 35 years primarily through lower airfares and more flight options. For the airlines, deregulation has unleashed an era of dogfighting between the incumbent legacy carriers and various entrants. While some carriers have developed successful business models to compete in the deregulated market (most notably Southwest), the industry on a whole has suffered in cycles, but since 2001, the airlines have witnessed a prolonged period of high instability. Economists have offered various explanations for this instability in the industry including volatile and rising fuel prices, severe macroeconomic recessions in the global economy, and the growing market share of LCCs. To survive in this increasingly competitive market, airlines need to find long-term solutions. However, some of their proposed solutions cannot be achieved without government backing.

First, the implementation of NextGen is in the hands of the FAA, but the modernization of the national air traffic control system is reportedly behind schedule and over budget even though NextGen promises to bring large economic and environmental gains. In the name of further deregulation, one suggested solution is privatizing the national air traffic control. In 1996, Canada established NavCanada, a private sector ATC organization, which is financed by publicly traded debt, and privatization has led to improved technological modernization, safety, and service quality for passengers.¹⁹⁸ Privatization of the US ATC would provide better

¹⁹⁸ Clifford Winston, "On the Performance of the U.S. Transportation System: Caution Ahead," *Journal of Economic Literature* 51, no. 3 (2013): 812.

economic incentives to expedite the implementation of NextGen so that travel times decrease with more direct routes and less congestion-caused delays. Also, airlines will save on fuel costs. Similarly, airport privatization could “encourage (smaller) private airports to compete for (smaller) aircraft operations by, for example, taking advantage of advances in GPS technology that have improved access to smaller airports, by upgrading runways and gates, and by offering van and rental car service to improve travelers’ access to the central city and other parts of the metropolitan area”.¹⁹⁹ Privatization of ATC and airports may help encourage technological improvements and more competition.

Since high fuel prices appear to be the new normal for all modes of transportation, airlines will continue to upgrade their fleets to more fuel efficient aircraft in the upcoming years. As the costs of delaying buying more fuel efficient planes become higher, this trend encourages carriers to seek cost-savings in order to remain competitive with LCCs which have newer and more fuel-efficient fleets. The danger for airlines is not necessarily higher fuel prices but rather volatile fuel prices. Airlines cannot adjust their operations to sudden surges in fuel prices which can lead to large losses. As the end of high and volatile fuel prices is not in sight, the airline industry will need to find ways to upgrade their fleets despite their current weak financial conditions and learn better ways to adjust to unpredictable spikes in fuel costs.

While government approval of airline mergers may seem almost counterintuitive to the goals of deregulation, consolidation offers the financially weak airlines an opportunity to rationalize their networks and thus improve operational efficiency. As discussed above, the past decade has seen a wave of mergers between some of the largest airlines which has created fear of anti-competitive effects. During a Congressional Hearing regarding the American Airlines – US Airways Merger, Winston provided testimony suggesting that the merger would allow the two

¹⁹⁹ Ibid, 815.

merged carriers to optimize its network with route exits and entries, to expand its international network providing consumers with more destinations, and to retire its less efficient aircraft more quickly.²⁰⁰ Also, Winston explains that “retrospective empirical assessments of airline mergers have generally found that the presence of a merged air carrier in a market does not lead to higher fares”.²⁰¹ In an attempt to sooth concerns that consolidation may lead to higher prices, Winston argues that the government can work to counteract any anti-competitive effects by encouraging competition in two other ways. One, American and foreign governments should negotiate more Open Skies Agreements which give US and foreign airlines more access to enter and set fares in US international markets. In preliminary estimates, Winston and Yan 2012 found that previously negotiated Open Skies deals have generated \$5 billion in annual gains to passengers and estimate that consumers could gain another \$5 billion a year if the US government reached these agreements with other countries with which the US has significant international passenger traffic.²⁰² Two, Winston testified that “The final step to create a highly competitive global airline industry would be for the United States to allow foreign airlines to serve U.S. domestic markers. (Other countries should also allow foreign carriers, including U.S. carriers, to serve their domestic markets).”²⁰³ According to Winston, opening the US domestic market to foreign carriers such as Ryanair or British Airways would lead to more competition and thus lower fares and service improvements and does not pose a threat to national security or safety.²⁰⁴ Although

²⁰⁰ Clifford Winston, “The American Airlines-US Airways Merger in an Evolving Airline Industry,” testimony, February 26, 2013 before the U.S. House of Representatives Committee on the Judiciary Subcommittee on Regulatory Reform, <http://www.brookings.edu/research/testimony/2013/02/26-airline-merger-winston>.

²⁰¹ Ibid.

²⁰² Clifford Winston and Jia Yan, “Open Skies: Estimating the Benefits of Free Trade in Airlines Services,” *Unpublished* November 2012, PP.

²⁰³ Clifford Winston, “The American Airlines-US Airways Merger in an Evolving Airline Industry,” testimony, February 26, 2013 before the U.S. House of Representatives Committee on the Judiciary Subcommittee on Regulatory Reform, <http://www.brookings.edu/research/testimony/2013/02/26-airline-merger-winston>.

²⁰⁴ Ibid.

Winston makes his case to encourage a more globally competitive airline industry, his suggestions are politically infeasible in the current national political climate.

In conclusion, the airline industry has faced a tumultuous period of financial instability that continues to threaten long-term sustainability of the industry. Fortunately, various policy options exist that may provide airlines with the opportunity to improve their business and also may lead to economic welfare gains for the whole country. The future of the airline industry is heavily dependent on the decisions of both US policymakers and the airlines themselves in response to an increasingly global airline market.

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