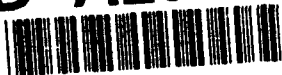


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THESIS

AN ANALYSIS OF THE
PROPOSED AIRLINE COMPETITION
ENHANCEMENT ACT OF 1989

by

Janice S. Smith

June, 1990

Thesis Advisor:

Dan C. Boger

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An Analysis of the Proposed
Airline Competition Enhancement Act

by

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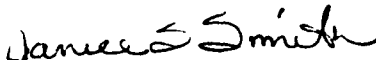
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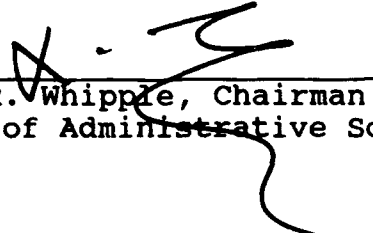
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ABSTRACT

This analysis examines problem issues in the passenger airline industry and determines how the proposed Airline Competition Enhancement Act would impact these issues. A summarization of the history of airline deregulation is followed by an assessment of the factors that are contributing to the call for re-regulation. From this assessment, recommendations for changes to the proposed Airline Competition Enhancement Act are made.



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I. INTRODUCTION

A. BACKGROUND

In 1978, the Airline Deregulation Act was passed in order to promote competition, provide more customer options, and encourage efficiency in the passenger airline industry. It was envisioned that without restrictive and outdated government regulations, new competitors would enter the market and incumbent carriers would be invigorated. The public would be the beneficiary of lower fares and more frequent flights. However, after approximately ten years of deregulation, unanticipated changes in the passenger airline business have caused various government and private interest groups to re-evaluate current laissez-faire policies and propose new regulations.

In 1989, Senators John McCain, R-Ariz., and John Danforth, R-Mo., introduced the Airline Competition Enhancement Act. Appendix A contains a copy of this proposed legislation. According to Senator Danforth, "...th[is] bill would eliminate barriers to entry and anti-competitive practices that are keeping airlines from providing the public quality air transportation at a reasonable price." [Ref. 1:p. 4]

B. PURPOSE AND METHODOLOGY

The purpose of this thesis is to analyze the major issues in the passenger airline industry and determine if the proposed Airline Competition Enhancement Act would favorably impact these issues. It will include a summarization of the history of airline regulation and examine the factors that are contributing to the call for re-regulation, such as hub-and-spoke routing, computer reservation systems, code-sharing, and industry concentration. The information contained in this analysis will be drawn from recent government and commercial publications and periodicals.

II. AIRLINE REGULATORY POLICY

A. AIRLINE REGULATION FROM 1926 TO 1978

At first, government involvement in aviation was primarily directed at supporting the Postal Service. In 1926, the Kelly Act empowered the U.S. Postmaster to enter contracts with commercial airlines for Airmail service. The Watres Act of 1930 required all commercial carriers to adhere to regulations set forth by the Postmaster General. The Postmaster General proceeded to exceed his authority by rigging competitive bids and accepting side payments when disputes arose [Ref. 2:p. 81]. The resulting scandal created the Air Mail Act of 1934, which transferred fare determination and entry to the auspices of the Interstate Commerce Commission. Additionally, two land mark accidents which took the lives of football coach Knute Rockne (1931) and Senator Bronson Cutting (1935), caused new interests in safety regulations.

The Civil Aeronautics Act of 1938 established the Civil Aeronautics Authority (changed to the Civil Aeronautics Board in 1940). The Civil Aeronautics Board (CAB) was made responsible for setting economic controls over rates and operating routes. It was also responsible for enforcing safety rules, testing pilots and aircraft, air traffic control, and accident investigations. Since 1939 was the

first accident-free year in a decade, the new federal safety regulations were validated.

The next major piece of legislation was the Federal Aviation Act of 1958. It created the Federal Aviation Agency to promote the economic development of aviation. It also granted the CAB broader authority in setting route and rate constraints on carriers in order to correct inequities and inefficiency. In 1966, the Federal Aviation was renamed the Federal Aviation Administration (FAA) and incorporated into the new Department of Transportation.

Strict regulation continued throughout the 1960's and early 1970's. A series of Congressional hearings in the 1970's vented problems with airline regulatory policy. Proponents of deregulation argued that,

...although the CAB set trunk airline fares at high, 'cartel' levels, the potential profits from these fares [were] competed away through frequency and service quality competition on the part of the airlines. As a result, the airlines [did] not gain profits from the regulation, and the consumer [was] left paying a fare much higher than he would prefer.... [Ref. 2:p. 95.]

Critics feared that deregulation would lead to instability and a higher concentration of the dominant airlines [Ref. 3:p. 327]. These hearings led to the 1977 appointment of Alfred Kahn to head the CAB for the purpose of dismantling the economic regulatory system. Kahn's initial changes promoted the entry of lower fare carriers and increased price

competition. The purpose of this new permissiveness was to encourage new entries and competition into an industry that many felt had become stagnant under 40 years of regulation. However, the deregulatory movement was such a potent force in the government environment that Kahn's initiatives culminated in the Airline Deregulation Act of 1978.

B. THE AIRLINE DEREGULATION ACT OF 1978

On 24 October 1978, President Carter signed the Airline Deregulation Act as an amendment to the twenty year old Federal Aviation Act. The main focus of the Act was the reform of the rate structures and routing. It did not deregulate safety legislation. Its major provisions were:

- The elimination of the "zone of reasonableness" rate restrictions which had formerly set ceilings (5-10% above standards) and floors (50% below standards) that carriers could not exceed [Ref. 3:p. 327].

- The elimination of long-haul discrimination standards that required fares be set on an escalating scale based on distance.

- The elimination of profit impact tests that had been used as a basis for approving proposed discount fares by measuring their impact on industry-wide profits.

- The elimination of a fixed fare ratio between first class and coach service.

- The loosening of route restrictions which enabled carriers to apply for dormant routes on a first-come-first-served basis.

- The guarantee of "essential air service" to small communities already being served at the time of deregulation.

- The guarantee of unemployment benefits for non-management employees laid off during the initial transition to deregulation.

- The maintainance of preference, prejudice, and discrimination bias as a justification for finding a fare unlawful.

From 1978 to 1985, the CAB presided over the implementation of the above mentioned provisions. The final provision of the Deregulation Act was to arrange for the CAB's own dissolution. The CAB's few remaining responsibilities were transferred to other agencies such as the Department of Transportation, the U.S. Postal Service, and the Justice Department. In 1985 the CAB was disbanded.

Proponents of deregulation anticipated that the new freedoms would bring about the following positive results [Ref. 3:p. 182]:

- Overall lower fares
- Open competition
- A wider variety of service options

- Greater efficiency and lower costs
- Elimination of excess capacity
- Continued financial viability
- Increased innovation

C. ASSESSMENTS OF THE DEREGULATION ERA

At the conclusion of the first decade of deregulation, numerous assessments were made concerning deregulation's impact on the airline industry. One of the leading spokespersons for the opponents of deregulation is Melvin Brenner, an airline consultant with over 40 years of commercial and government experience. In his 1988 article, "Airline Deregulation - A Public Policy Failure," Brenner claims that deregulation has failed to live up to its promise in the following areas [Ref. 4].

There is a consensus between opponents and proponents that competition has not bloomed as anticipated. Brenner states that the six leading carriers controlled 71% of industry traffic in 1978 and 79% of the traffic in 1987, thus there is less competition and a higher concentration. The advantages of large carriers (computerized reservation systems, the capacity to last-out price wars, frequent flyer incentives, etc.) have effectively restrained the entry of small carriers into the national market.

Brenner concedes that there has been a decline in overall fare prices, but that the decline is a continuation of pre-deregulatory trends brought about by improvements in technology. He also claims that there is a wide disparity in pricing, based not on service, but on what the market will bear and the major airline's ability to undercut regional competition by undercutting marginal costs.

With the rapid development of the hub-and-spoke system, scheduled flights have increased at hubs located in large cities and shown a slight decrease in small cities. The small community's loss has been offset by the wider array of destinations offered via hub connections. Brenner finds fault with the congestion and delays these changes have made.

Brenner states that there has not been a sharp decrease in costs since deregulation. Labor costs have decreased, but operating costs have increased due to a shift to smaller aircraft and the extension of routes.

Not surprisingly, one of the leading proponents of deregulation is Alfred Kahn. In his 1988 article, "Airline Deregulation - A Mixed Bag, But a Clear Success Nevertheless," Kahn summarizes why he believes deregulation has had an overall positive effect [Ref. 5].

Kahn concedes that the industry is more concentrated, but this is more than offset by the greater variety of options

available to the public. He also contends that many of the concentration problems that resulted from bankruptcies, mergers, and acquisitions, were not caused by deregulation, but by the government's failure to enforce antitrust laws.

He cites the overall decline in fares and the introduction of bargain fares as a direct result of the more competitive deregulatory era. These new options made flying more accessible to the general public.

Kahn asserts that increased competition has caused an industry-wide shake out, but that it was long overdue. He believes that remaining problems can be rectified by the enforcement of existing consumer protection and antitrust laws, and that re-regulation would be disastrous.

Congressional activists have added fuel to this debate by introducing the Airline Competition Enhancement Act of 1989.

D. THE AIRLINE COMPETITION ENHANCEMENT ACT OF 1989

The proposed Airline Competition Enhancement Act is not a call for a return to the strictly controlled regulatory system that was in effect prior to 1978. Instead, it is an attempt to reduce the power of the airlines that have been dominating the market since deregulation. The following is a synopsis of its main proposals.

1. Computer Reservation Systems

This section would require airlines to divest themselves of their Computer Reservation Systems (CRS), and it would prohibit code-sharing.

2. Dominant Air Carriers

The second major proposal states that,

An air carrier operating aircraft at a concentrated hub airport shall be presumed to have been engaged in unfair or deceptive methods of competition in air transportation...if the carrier is a dominant air carrier at that airport. [Ref. 6:p. 3]

3. Injunction Authority

The third part of the proposal grants the Secretary of Transportation authority to enjoin any carrier or ticket agent engaged in unfair practices, if such practices are believed to be detrimental to the public interest.

4. Passenger Facility Charges

This section would allow concentrated hubs to assess a fee from passengers enplaning at their airports in order to, "...generate revenue for security, capacity enhancement, and noise mitigation projects." [Ref. 6:p. 5] Each assessment would require the Secretary of Transportation's approval.

5. Slot Allocations

The last major proposal would require that all slots at high density airports be re-auctioned within 180 days of the bill's signing. It further provides for limiting the

length of slot contracts and the imposition of minimum useage requirements.

Airline regulatory policy and its impact have been the subject of scholarly analysis and emotional public debate. As in the past, current regulatory proposals have been introduced in an effort to maintain the economic health of an industry that is a vital part of the nation's infrastructure.

The next chapter will analyze the major issues that are affecting the airline industry and examine whether the proposed legislation might resolve the problems.

III. MAJOR ISSUES IN THE AIRLINE INDUSTRY

The Airline Deregulation Act of 1978 ignited an era of growth and turbulence that was fueled by the application of new technology and aggressive management practices. Code-sharing, computer reservation systems (CRS), hub-and-spoke routing, and tighter concentration significantly changed the environment of the industry. These new factors created effects that were not anticipated and that have helped to swing momentum back in the direction of re-regulation.

A. CODE-SHARING

1. Background

Code-sharing is a system whereby regional or commuter airlines make a contractual agreement with a large airline to share its two letter CRS designator number. For example, a flight from Monterey, CA to Washington DC, via San Francisco, may show an American Airlines designator code for both flight segments, when in actuality, the first segment of the trip may be on a Wings West commuter flight. Table 1 lists current code-sharing arrangements between the dominant and regional carriers.

TABLE 1
MAJOR CARRIERS' CODE-SHARING AGREEMENTS - 1988

Texas Air

Air Midwest
Air New Orleans
Atlantis
Bar Harbor
Britt
LIAT
Eastern Metro
PBA
Precision
Rocky Mountain
Southern Jersey

USAir

Air Kentucky
Brockway
CCAir
Chautauqua
Crown
Henson
Jetstream International
Pennsylvania
Pocono
Suburban

American

AVAir
Command
Executive Air Charter
Metro Express II
Nashville Eagle
Simmons
Wings West

Delta

Atlantic Southeast
Business Express
Comair
Sky West

Pan AM

Ransome

Trans World

Air Midwest
Resort Air
Resort Commuter

United

Air Wisconsin
Aspen
Presidential
NPA
San Juan
Southcentral

Northwest

Big Sky
Mesaba
Pheonix
Simmons

Source: [Ref. 7:p. 191]

This system is advantageous to the large airline in that they can claim they cover more destinations, and they can siphon-off commuter traffic arriving at major airports more effectively. This is accomplished by incorporating the cities served by the commuter airline into the parent airline's destination inventory, and then co-ordinating flight schedules so that code-sharing connections are the most efficient for the traveler. Likewise, the commuter airline gains a larger percent of traffic and a secure niche at a major airport. This symbiotic relationship is being criticized by the government, non-code-sharing airlines, and the traveling public for several reasons.

2. Problems with Code-Sharing

Code-sharing reduces competition. Non-code-sharing regional airlines find it difficult to challenge established carriers, because travelers prefer all segments of a flight to be on one carrier in order to ease connection hassles. The traveler may be annoyed to discover his single-coded flight is actually a multi-carrier flight, but there is little incentive to change bookings. In order to reduce consumer deception in code-sharing, the Department of Transportation issued a new ruling in September 1985. It requires published schedules to identify the regional carriers in code-sharing

flights and it requires travel agents to verbally notify passengers when they are being booked on a code-sharing flight [Ref. 8:p. 414].

Since flights are listed on a CRS screen according to elapsed travel time and how closely the flight matches the departure time requested by the traveler, major airlines can work with their code-sharing partners to schedule connections that are more efficient. This practice gives an airline a more dominant position on the CRS screen.

Another problem with code-sharing is that smaller code-sharing regional airlines are no longer competing with the larger airlines for long-haul flights. This lack of aggressiveness has reduced competition by inhibiting challenges from smaller airlines with growth potential.

Code-sharing has ignited a flurry of lawsuits citing unfair competition, breach of service agreements, and violations of the Sherman Antitrust Act. A typical suit involved Northwest Airlines and a mid-western regional airline called Fischer Brothers [Ref. 6:p. 193].

Fischer was a reputable and financially secure business when it entered into a five year code-sharing contract with Northwest. When Northwest merged with Republic airlines it ended up with redundancy in its feeder flights due

to Republic's code-sharing agreement with Simmons Airlines. Fischer proposed a new feeder arrangement which would tap new markets and not conflict with the Simmons routes. Northwest gave Fischer's plan to Simmons and then terminated Fischer's contract by invoking a six month escape clause. This case is now in the courts. Fischer was forced to sell out to Midway Airlines and start over again with two nine-passenger aircraft.

Code-sharing did not originate with deregulation [Ref. 8:p. 405]. Advantageous flight scheduling has been a sound management practice for decades, but CRS has amplified the anti-competitive aspects of the system. Up until 1986, code-sharing contracts proliferated. Many commuters eagerly entered contracts, but others signed on reluctantly, fearing that to remain independent would be a slow death. In 1986, the saturation point for partnerships was reached and a culling process began. More and more, the survival of the regional or commuter airline is linked to the solidity of its contract with the majors [Ref. 7:p. 191].

3. Proposed Legislation's Impact on Code-sharing

The proposed Airline Competition Enhancement Act would prohibit airlines from code-sharing. Proponents of re-regulation contend that the elimination of code-sharing will

reduce the unfair marketing advantages of dominant carriers. Proponents of code-sharing argue that close coordination of schedules, leasing adjacent gates, and joint marketing efforts are beneficial to the consumer.

The elimination of code-sharing would purify CRS listings by differentiating between airlines. Furthermore, it would eliminate the rigid, exclusionary contracts between major and regional carriers. Regional airlines have become so dependent on the majors for their survival that, "...no commuter/regional airline has ever survived after being cut loose from a major partner." [Ref. 7:p. 190] On the other hand, the benefits of controlling the regionals is so important to the majors that they have obtained equity positions in 18 out of the 51 regional carriers with code-sharing agreements [Ref. 7:p. 190]. Regional airlines who were hurt by code-sharing often brought suit against the majors, but with limited financial resources, they were at a distinct disadvantage and often dropped their case.

The elimination of code-sharing contracts would help to open competition among regional carriers, but code-sharing's infrastructure is so deeply intertwined in each hub's operation that it will require substantial enforcement efforts to insure that the change is not superficial. The few

scheduling benefits of this system could be maintained through the informal cooperative marketing arrangements that existed before code-sharing.

B. COMPUTER RESERVATION SYSTEMS

1. Background

Primitive forms of CRS first appeared in the 1960's, but with the rapid growth in computing power and speed, the airlines were able to develop effective, real-time computer reservation systems for use in travel agencies by the mid 1970's. Since CRS was still in its infancy during the push for deregulation, it was not an issue of contention; however, its phenomenal growth in scope and importance to the airlines has prompted the attention of those who favor re-regulation [Ref. 1:p. 5].

Table 2 lists the five computer reservation systems currently dominating the travel industry. The airline provides the subscribing travel agency with the terminal(s), software, communications network, training, and other options. Subscription fees run between \$5,000 and \$15,000 annually [Ref. 9:p. 33].

TABLE 2
AIRLINE COMPUTER RESERVATION SYSTEMS

<u>System</u>	<u>Airline</u>	<u>Share of CRS Market (Aug 86)</u>
SABRE	American	34 %
APOLLO	United	25 %
SODA	Eastern	17 %
PARS	TWA	13 %
DATAS	Delta	11 %

Source: [Ref. 9:p. 33]

Travel agents book a flight by entering pertinent data into the terminal and advising the customer of the best options listed. Once the customer has made his choice, the tickets and boarding pass are printed at the agency, which reduces check-in delays at the airport.

Information concerning the booking and the customer is kept on file at the travel agency and transmitted to the airline's central processing system where the data is used for adjusting fares, flights, and marketing strategy.

Travel agents write between 80% and 90% of all airline tickets, which is up from 37% in the pre-deregulation year of 1978 [Ref. 10:p. 88]. This is mainly attributed to the increasing complexity of fare pricing and the overall increase in non-business passengers.

There have been two attempts to build a single universal CRS that would impartially serve the needs of airlines and consumers. In the mid 1970's a group of travel agencies considered building their own system. This was vehemently opposed by airlines and quickly collapsed. The airlines then proceeded to form their own consortium for the same purpose, but internal disagreements and the threat of anti-trust action defeated this effort [Ref. 11:p. 179].

2. American Airlines' SABRE

American Airlines' SABRE is the largest, most sophisticated CRS. A detailed examination of its scope helps to explain why it is also the most frequent target for criticism from re-regulators. SABRE (Semi-Automated Business Research Environment) is the world's largest privately owned, real-time computer network. The first incarnation of SABRE was as a basic, in-house reservation system. It evolved into an international reservation system and extensive travel agency automation network that is powered by seven IBM mainframe computers located in a \$35 million high security, underground facility near Tulsa, Oklahoma [Ref. 12:p. 109]. Table 3 is a profile of SABRE's transaction capacity as of June 1989.

SABRE offers a wide range of services to travel agents. In addition to reservations there is an expanding office automation and telecommunications function. A summary of these features is listed below [Ref. 9:p. 1].

a. Schedules and Reservations.

This provides schedules and seat availabilities, as well as additional information, such as Department of Transportation on-time percentage factors and service amenities.

TABLE 3
SABRE TRANSACTION CAPACITY (JUNE 1989)

Agency and Corporate Locations	14,500
Fares Listed	45 million
Airlines w/schedules in SABRE	647
Hotel chains listed	140
Rental car companies listed	46
Tour companies listed	35
Peak-hour usage	1,885 msg/sec
Peak-day usage	68.9 million msg

Source: [Ref. 12:p. 1]

b. Pricing.

SABRE guarantees the accuracy of its prices and provides a "Bargain Finder" feature that scans the system to find the lowest possible fare. The terminal will also print out a listing of all fares available from the highest to the lowest for the benefit of the customer. There is also an in-depth listing of current pricing rules and regulations.

c. Documentation.

The SABRE system prints tickets and boarding passes at the travel agency office. There is also a Satellite Ticket Printer (STP) that enables tickets to be printed at remote locations for corporate clients. It also provides an itinerary which includes air, hotel, car, tour, and insurance information in an easy-to-read format.

d. Automated Management System.

SABRE provides the travel agent with electronic files and editing capability on a wide variety of customer data, such as addresses, invoice remarks, and historical usage. It can generate productivity reports, track commissions, measure trends, and produce income-revenue statements. Since the system uses an IBM PS/2, SABRE also offers optional word processing, spreadsheet, database management, and electronic mail software.

e. Travel.

In addition to airline reservations, SABRE also provides a similar scope of service for car rentals, hotel reservations, and tours.

f. Miscellaneous Services.

Other travel related services and products include SABRE Travel Guide, SABREFAX, Telex, Cablegrams, Mailgrams, currency exchange rates, florist services, theater tickets, and a weather service.

g. EAASY SABRE.

EAASY SABRE enables the corporate client or home personal computer user to access the SABRE flight listings. This is currently a "view only" feature. The customer must make the reservation through their travel agent or the airline.

SABRE owes much of its success to American's aggressive development policy and innovative thinking. In 1986, American's parent company, AMR, created a subsidiary called Airline Automation Services which markets SABRE-based systems to other airlines. Its customers have included Pan Am, All Nippon, Braniff, Southwest and a number of commuter airlines. Additionally, expertise gained in handling massive amounts of data through telecommunications systems resulted

in the spin-off subsidiary, American Airlines Direct Marketing Corporation. It generated \$40.1 million in revenues in 1986 and is now one of the world's largest telemarketing operations.

3. Problems with CRS

CRS technology, like SABRE, has been a boon to travel agents and the airlines, but its influence on the industry has been so extensive that it has attracted controversy.

a. CRS as a Source of Marketing Information.

One of the basic assumptions of a perfectly competitive market is that, "...each participant must have perfect knowledge of all market conditions and possibilities." [Ref. 13:p. 282] When an airline has its own CRS, it has access to to all the information concerning customer preferences generated by the ticket/travel sales. This enables the airline to develop sophisticated yield management systems which can predict booking trends on specific flights and effectively maximize revenues. The computer does not instigate price or schedule changes based on this data. These decisions are still made by management. An airline, like American, is also able to monitor a competitor's booking trends by analyzing the competitor's flights booked through SABRE. With this situation, airlines that do not have their

own CRS do not have access to the same knowledge as their competitors.

b. Profiteering.

CRS has been a very lucrative investment. The airlines obtain revenues in two ways. Each travel agent pays between \$5,000 and \$15,000 per year in subscriber fees and each reservation on a flight other than on the vendor's airline results in an average charge of \$1.85 per flight segment [Ref. 9:p. 33]. In 1987 and 1988, SABRE and United Airlines' Apollo garnered \$450 million in booking fees [Ref. 14:p. 22]. "SABRE accounts for 5% of the gross revenues of the AMR Corporation ...but earns more than 15% of its profits." [Ref. 13:p. 82] AMR expects these percentages to rise to 25% from gross revenues and 40% from profits [Ref. 9:p. 33]. These substantial profits are partially offset by the high cost of initial investments. American incurred a \$350 million negative cash flow between 1976 and 1982. This cost was directly attributed to SABRE start-up costs [Ref. 15:p. 82].

c. Bias.

Bias is the most troubling and persistent criticism of CRS. Since the main criterion for being listed first on a CRS screen is the elapsed time from origin to destination, the shorter the time, the higher an airlines

flight is listed. When transfers are required, airlines with code-sharing contracts will minimize connection times to obtain a higher listing [Ref. 8:p. 412]. If a flight can be broken down into two or more segments, the airline owning the CRS will program an artificially high transfer time for competitors connecting flights. SABRE penalizes interline transfers by up to 90 minutes [Ref. 8:p. 412]. Another CRS will list interline transfers only after all of their code-sharing flights have been listed [Ref. 8:p. 412]. Since the CRS screen only lists three flights at a time, there is a bias in favor of the CRS-owning airline.

There are also complaints that travel agents are biased in selecting flights. CRS does require a "minimum use" quota and there are substantial penalties for switching from one airline's system to another. It has also been estimated that 70% to 90% of computer reservations are made from the three choices that appear on the first display screen and 50% are made from the first line displayed. [Ref. 8:p. 410]. This is not necessarily a case of bias or laziness on the part of the travel agent. The listing at the top of the first screen should be the best, given the customer's requirements, however, it does reinforce the need for the listing to be unbiased.

4. Proposed Legislation's Impact on CRS

The proposed Airline Competition Enhancement Act would require airlines to divest themselves of their CRS. Its intended effects and possible repercussions are listed below.

a. Market Knowledge

Proponents of the new legislation argue that if airlines were forced to divest, the currently restricted market knowledge could be made available to all airlines, thus eliminating an unfair advantage. However, "perfect competition" is a theory that does not translate into free market reality. The use of computers is considered a fair competitive strategy in all industries. Risking capital on systems (such as CRS) that enhance a company's share of the marketplace is also a legitimate practice. It is managerial expertise that ultimately decides the success of a company.

American was willing to absorb the 350 million dollar negative cash flow between 1976 and 1982 in order to have SABRE [Ref. 9:p. 33]. Small airlines, which cannot afford to incur that type of financial strain, are holding their own by vigilently managing their smaller, specialized market share. Unless the industry is strictly re-regulated, equal access to knowledge is not possible.

b. Bias

Biases within the system are grounds for concern, but not a justification for CRS divestiture. A fine-tuning of existing anti-bias rules can circumvent listing problems. Travel agent quotas and penalties are legitimate business practices, and if they are considered separately from screen biases, they do not pose an unfair advantage or threat to competition.

c. Profits

In testimony before the Senate Commerce, Science and Transportation's Aviation Subcommittee, Robert Crandall, CEO of American Airlines stated, "The message I hear (from pro-regulators) is that we are free to be innovative, free to risk capital, (and) free to compete as long as we lose money, (but) if we are successful, the rug is likely to be pulled out from under us." [Ref. 16:p. 15] Considering the highly transitory nature of technological advantages and fluctuating profit margins, the current successes should not be penalized.

To see divestiture as a cure for bias is an oversimplification that ignores the complex chain reactions that would be set-off by such a move. The major airlines would gain from the initial divestiture and lowered research and development costs, but the long term loss of revenue and

the cost of obtaining yield management data would lead to higher fares in order to maintain a positive profit margin.

C. HUB-AND-SPOKE SYSTEMS

1. Background

Whereas forms of CRS and code-sharing were in existence prior to 1978, the burgeoning hub-and-spoke system is more directly correlated to changes following the Deregulation Act. Under regulation, carriers applying for a new route had to prove to the CAB that "...the public would benefit from the proposed service and that airlines already serving these routes would not be adversely affected." [Ref. 17:p. 210] The CAB used this power as a means to insure stability and provide financial opportunities for weak carriers. This practice reached its peak in the early 1970's when the CAA declared a new route moratorium and halted competition in order to revive sagging revenues.

This system did have anti-competitive aspects. Applicants had to demonstrate a history of competency before being granted a new route. This was not possible for new airlines. Between 1950 and 1974, the CAB rejected all 79 route applications submitted by new interstate airlines [Ref. 17:p. 210].

The CAB's route moratorium ended in 1975 and restrictions were gradually loosened. They began to allow

free entry unless incumbents could prove that the new route was not in the public interest. Route authorizations quadrupled in the first 18 months of deregulation [Ref. 17:p. 211]. This new freedom set the ground work for the hub-and-spoke system.

In adopting the hub-and-spoke method, carriers sought to improve efficiency by changing flight patterns on low volume routes. Instead of flights being scheduled on a city-to-city network, high traffic/centrally located airports were designated as hubs. Figure 1 provides a diagram of this change. Smaller cities feed passengers to the hub for consolidation flights and siphon off hub passengers on the return flights to the small cities.

This system benefits the carriers by increasing the passenger density of long haul flights, which, in turn, lowers unit costs. By concentrating service and maintenance support at hub airports, there are additional savings. Meanwhile, the small city passenger reaps the benefits of a wider variety of destinations. Possible negative effects include congestion problems during peak hours and an underutilization of personnel at satellite airports due to reduced activity levels. When the positive and negative effects are quantified, the results indicate that for each one per cent

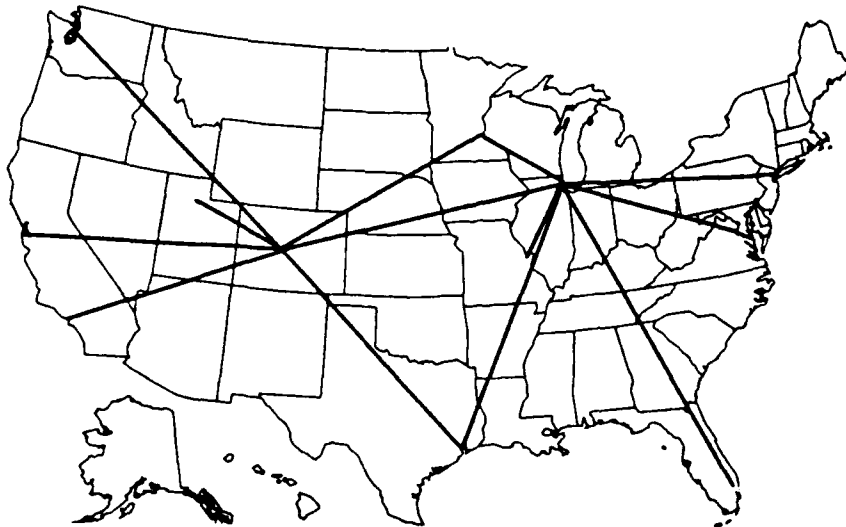
FIGURE 1

COMPARISON OF LINEAR AND HUB-AND-SPOKE ROUTE SYSTEM

The Linear Route System



The Hub-and Spoke Route System



Source: [Ref. 17:p. 213]

increase in hubbing, there has been an .11% decrease in unit costs [Ref. 17:p. 221].

2. Problems with Hub-and-Spoke Routing

Critics of hub-and-spoke routing contend that it is anti-competitive and creates congestion. Since landing slots and gate space at major hubs are being fully utilized under long term contracts, new entrants must wait for vacancies or the construction of new facilities. When new competitors do break into a hub, they are further constrained by the incumbent airlines' domination of routes and economy of scope.

The airport congestion problem that developed in the 1980's is a result of airport construction lagging behind increases in passenger traffic. The hub-and-spoke system further exacerbated the problem by promoting more frequent flights in order to increase the possible connection permutations. The interdependence of these networks created chain reaction delays during peak hours.

3. Proposed Legislation's Impact on Hub-and-Spoke Systems

a. Facility Charges

The Airline Competition Enhancement Act proposes passenger facility charges as one means to diminish the cost of congestion. This spreads the cost burden to the public, but does not discourage the volume or scheduling of traffic.

A more effective solution for congestion would be to change the current landing fee structure. Presently, fees are assessed on the basis of aircraft weight. When airports were uncongested, this system was logical in that it was assumed that larger planes could more easily afford the cost. However, this weight assessment system no longer deters congestion. The FAA estimates that, "...additional passenger time and aircraft operating costs caused by congestion approach \$5 billion annually." [Ref. 18:p. 709] If landing fees were based on the delay costs incurred by other users and the airports, there would be a significant increase in airport revenues. Table 4 illustrates this point. This would deter commuter airlines and general aviation from using airports during peak hours.

b. Slots

The Competition Enhancement Act's plan to redistribute slots is an attempt to break the formidable control exercised by the dominant carriers. Many long-term lease for slots were signed prior to deregulation as a means of insuring that the carriers would stay long enough to justify municipal expenditures [Ref. 19:p. 60]. Majority-in-interest clauses in these leases allow carriers to veto construction of new slots in order to protect their market

TABLE 4
ANNUAL ECONOMIC EFFECTS OF OPTIMAL RUNWAY PRICING
(1988 DOLLARS)

Affected Component	Change relative to current practice (billions of dollars)	
	Optimal Pricing in 1988	Optimal Pricing Under Regulation in 1977
Carrier operating costs	1.23	.41
Passenger time costs	3.62	1.20
Landing fees	(11.58)	(5.41)
Passenger priced out of the market	(0.95)	(0.41)
Airport revenue and costs	11.50	5.36
Total	3.82	1.15

Source: [Ref. 18:p. 709]

share [Ref. 19:p. 60]. Thus, even if the municipality had the funds and need to expand, incumbent carriers could prevent it for parochial reasons.

A complete re-auction of slots may be more draconian than is necessary. Most of the long-term leases will be expiring in the coming decade and airport authorities are intent on negotiating shorter five to ten year leases that do not contain majority-in-interest clauses [Ref. 19:p. 62]. In this area, the industry is self-correcting. Legislation that prohibits exclusivity would help to reinforce municipal interests and open slots to competitive bidding without the disruption of wholesale re-auctioning.

D. INDUSTRY CONCENTRATION

1. Background

In 1978, 71% of the industry's traffic was handled by only six of the major carriers [Ref. 20:p. 84]. The Airline Deregulation Act sought to reduce the dominance of major airlines and distribute the concentration of market power over a wider variety of incumbent and new entry carriers.

Prior to 1978, mergers were not approved unless the airline being acquired was facing bankruptcy. Deregulation removed these merger barriers and the result was an unprecedented series of mergers. Table 5 lists these mergers.

TABLE 5
CARRIERS MERGED OR ACQUIRED (1978 - 1988)

<u>Carrier</u>	<u>Comments</u>
Air Cal	into American
Air Florida	into Midway
Braniff (Latin American)	into Eastern, then Texas Air
Britt	into People Express, then Texas Air
Continental	into Texas Air
Eastern	into Texas Air
Empire	into Piedmont, then US Air
Frontier	into People Express, then Texas Air
Henson	into Piedmont, then US Air
Hughs Air West	into Republic, then Northwest
Jet America	into Alaskan
National	into Pan American
New York Air	into Texas Air
North Central	into Republic, then Northwest
Ozark	into TWA
Pan Am (Pacific Division)	into United
PBA	into People Express, then Texas Air
People Express	into Texas Air
Piedmont	into US Air
PSA	into US Air
Ransome	into Pan American
Southern	into Republic, then Northwest
Transtar	into Southwest
Western	into Delta

Source: [Ref. 19:p. 185]

Mergers are attractive to the airlines because economies of scale have distinct advantages such as:

The ability that their vast networks gives [the] giants to feed traffic onto their own flights at the hubs they dominate;

...the enormous competitive advantages they have achieved through the development and exploitation of their own computerized reservation systems....

...the superior attractiveness of their frequent flyer programs;

...the effectiveness with which they have learned to meet the uniform low fares of much lower-cost competitors like People, selectively, with even more deeply discounted fares restricted to seats that would otherwise go out empty;

...their superior ability to last out price wars.
[Ref. 20:p. 189]

Mergers enabled carriers to achieve a "critical mass" necessary to thrive under the more aggressive atmosphere of deregulation [Ref. 4:p. 188].

Under deregulation, the CAB was the final authority for approving mergers. When it disbanded in 1985, the Department of Transportation assumed this role. During the first ten years of deregulation, mergers proliferated with virtually no interference from CAB/DOT. This was due to the leniency of the Reagan administration regarding business consolidations [Ref. 21:p. 36]. On 1 January 1989, merger approval was transferred to the Department of Justice (DOJ)

[Ref. 21:p. 34] It is not anticipated that there will be any significant increase in antitrust action unless prompted by mergers that would cause significant overlapping in the hubs and "...major barriers to entry for a replacement of the merged carrier." [Ref. 21:p. 37] This is due to the fact that the continuing Republican regime tends to be pro-business and anti-interference [Ref. 21:p. 36].

2. Problems with Industry Concentration

a. The Herfindahl-Hirschman Index.

The Herfindal-Hirschman Index (HHI) is a measurement used by DOT and DOJ to decide whether or not to approve a merger. An explanation of how this index is calculated is contained in Appendix B. A score below 1,000 is considered a low concentration; 1,000 to 1,800 is considered moderate; over 1,800 is a high concentration.

The problem with the index is that the figure used to calculate a carrier's HHI is based on an industry-wide share, not the local airport share. This lowers the HHI by spreading a carrier's enplanements over a wide range while disregarding pockets of dominance. As a result, the HHI measurement indicates that the industry today is only moderately concentrated. Table 6 illustrates this point. However, if the HHI were applied to individual hubs, 40 out

TABLE 6
CONCENTRATION OF LEADING AIR CARRIERS

1978

<u>Carrier</u>	<u>% of Industry Passenger Miles</u>	<u>HHI</u>
United	17.0 %	289.00
American	12.5	156.25
TWA	11.7	136.89
Eastern	10.9	118.81
Delta	10.1	102.01
Pan American	9.1	<u>82.81</u>
		885.77 (Low)

1987

Texas Air	19.4 %	376.36
United	16.2	262.44
American	13.6	184.96
Delta	11.6	134.56
Northwest	10.0	100.00
TWA	8.1	<u>65.61</u>
		1123.93 (Mod)

of 50 would be considered highly concentrated with a weighted average of 3,531 per hub. [Ref. 22:p. 131]

b. Contestability

When the framework for deregulation was set, there was a general assumption that the airline industry would be a contestable market [Ref. 19:p. 59]. It was expected that dominant carriers would be prevented from exercising monopolistic pricing due to the competitor's ability to enter this barrier-free market with lower prices. In 1978, Department of Transportation Secretary Jim Burnley stated,

The airline business is very different from many other businesses. It is inherently dynamic. An entry into a new...market often requires little more than the shuffling of equipment, in other words airplanes, and leasing of gates at airports."
[Ref. 19:p. 59]

This has proven not to be the case.

Formerly mentioned barriers, such as code-sharing, CRS, long-term slot leases, and economies of size have been effective in stunting the growth of many upstart carriers [Ref. 4:p. 185]. However, this does not mean that majors are invulnerable. Table 6 compares the major carriers before deregulation and nine years later [Ref. 4:p. 187]. Although the number remained constant, two new carriers were able to supplant previous members, which indicates that the industry is not stagnating and appears to be contestable.

3. Proposed Legislation's Impact on Industry

Concentration

The Airline Competition Enhancement Act's assumption of unfair practice if a carrier is dominant at a hub would have a major impact. The hubs to be included under this provision would have a HHI of over 1,800. Dominant carriers would be those with more than 40% of the enplanements at the hub [Ref. 6:p. 4]. Table 7 lists the hubs and carriers that would most likely be affected.

This provision would prompt an industry wide shake-down. All of the major airlines would be forced to reduce flights at one or more hubs. The drafters of the legislation assume that this would increase new entries, especially if slots were simultaneously being re-auctioned.

The good intention of lowering barriers will inevitably set off intense competition. Industry analysts are predicting the first quarter of 1990 will show an operating loss due to a 40% increase in fuel prices since August 1989 [Ref. 23:p. 54]. If Congress were to inject competition during a down turn, the negative consequences would be amplified.

Overall, the reduction of carrier dominance through lowered entry barriers has merit, but in order to implement

TABLE 7
DOMINANCE OF INDIVIDUAL CARRIERS AT PRINCIPLE HUBS
(1986)

<u>Hub Airport</u>	<u>HHI</u>	<u>Dominant Carriers</u>	<u>Market Share</u>
Charlotte	6,713	Piedmont*	79%
Salt Lake City	5,671	Delta	76%
Dallas/Ft. Worth	4,500	American	63%
Atlanta	4,468	Delta	55%
Dayton	4,417	Piedmont*	64%
St. Louis	4,402	TWA	83%
Houston (IAH)	4,077	Texas Air	72%
Pittsburgh	3,562	US Air	82%
Minneapolis	3,555	Northwest	79%
Denver	3,015	Texas Air United	47% 42%
Houston (Hobby)	2,953	Southwest	69%
Chicago (O'Hare)	2,836	United	44%
Baltimore	2,695	Piedmont*	59%
Newark	2,395	Texas Air	65%
Detroit	2,151	Northwest	68%

* Piedmont has since merged into US Air.

Sources: [Ref. 4:p. 190, and Ref. 22:p. 82]

it without harming the industry, Congress would have to legislate additional regulations that would constrain destructive price wars. This invasive form of supervision is a return to the pre-1978 regulatory environment.

IV. CONCLUSION

A. GOVERNMENT ACTIVITY

There have been several recent rulings and reports that indicate the federal government will continue to support deregulation.

In February 1990, the Secretary of Transportation released a task force report, "Competition in the U.S. Domestic Airline Industry" [Ref. 24:p. 1]. It concluded that deregulation is working and that the advantages of more service at lower costs have far outweigh the pocket problems of congestion and uneven benefits to the public.

In February 1990, the Secretary of Transportation also published his national transportation policy strategy entitled, "Moving America, New Directions, New Opportunities" [Ref. 25]. It did not contain any specific initiatives, but did call for an increase in state and local taxes and more federal spending. This increase in taxes is a potentially awkward situation, since the federal Aviation Trust Fund had \$6.85 billion in uncommitted funds at the end of 1989 [Ref. 26]. The money for this fund comes from various aviation taxes and is used for improvements to aviation facilities, equipment, and research [Ref. 25:p. 55] It is a potentially

awkward situation because Congress and airline officials are hesitant to raise taxes with such a large amount of uncommitted money being held in reserve. It is generally believed that the money in the Trust Fund is not being committed because it is being used to help meet the Graham-Rudman-Hollings budget targets [Ref. 27:p. 28]. The Secretary of Transportation concedes that there is money in reserve, but that the, "...total uncommitted balances represent significantly less than one year of Federal spending...." [Ref. 25:p. 55].

In December 1989, a federal jury rejected antitrust claims brought against United and American Airlines. Several carriers had accused the two majors of monopolizing the computer reservation systems business. United and American also won a series of cases that claimed their contracts with travel agents were unfair and unreasonable [Ref. 28:p. 1].

In February 1990, the Department of Transportation dismissed anti-competitive charges brought by Texas Air and Northwest against American. This case concerned screen bias and minimum use clauses in the SABRE network [Ref. 28:p. 1].

The Airline Competition Enhancement Act is still under consideration in Congress.

B. RECOMMENDATIONS

The following changes to the proposed Airline Competition Act are recommended:

- Eliminate code-sharing agreements in order to encourage initiative among commuter airlines and eliminate the exclusivity of code-sharing arrangements.

- Do not force CRS divestiture, but bias problems should be corrected. As for profits, the airlines should not be penalized for their success and innovativeness as long as their benefits are not obtained through unfair practices.

- Eliminate the prohibition against facility charges. They will help to raise revenue and be a tool for controlling congestion. Revenues raised through facility charges and other usage fees must be committed to improving the infrastructure. The Aviation Trust Fund should not be held hostage to the Graham-Rudman-Hollings Deficit Reduction Plan.

- Abolish long-term leases and majority-in-interest claims in order to make the distribution of slots more equitable.

This less severe version of the Act is more apropos to the current political climate and would still provide much needed reforms. The government would be providing the framework for change, but it would leave the market with enough freedom for healthy competition.

APPENDIX A

101ST CONGRESS
1ST SESSION

S. 1741

To amend the Federal Aviation Act of 1958 to increase competition among commercial air carriers at the Nation's major airports, and for other purposes.

IN THE SENATE OF THE UNITED STATES

OCTOBER 6 (legislative day, SEPTEMBER 18), 1989

Mr. MCCAIN (for himself, Mr. DANFORTH, and Mr. BOND) introduced the following bill; which was read twice and referred to the Committee on Commerce, Science, and Transportation

A BILL

To amend the Federal Aviation Act of 1958 to increase competition among commercial air carriers at the Nation's major airports, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 SHORT TITLE

4 SECTION 1. This Act may be cited as the "Airline Com-
5 petition Enhancement Act of 1989".

6 COMPUTER RESERVATION SYSTEMS

7 SEC. 2. Title IV of the Federal Aviation Act of 1958
8 (49 App. U.S.C. 1371 et seq.) is amended by adding at the
9 end the following new section:

2 “(a) NONDISCRIMINATORY ACCESS.—The Secretary of
3 Transportation shall ensure that computer reservation sys-
4 tems are available on a nondiscriminatory basis to all air car-
5 riers, ticket agents, and other persons.

6 “(b) PROHIBITION.—After January 20, 1991, no air
7 carrier or air carrier affiliate shall own, operate, or control a
8 computer reservation system.

9 “(c) CODE SHARING.—After the date that is ninety
10 days following the date of enactment of this section, an air
11 carrier—

12 “(1) shall not share or authorize the sharing of its
13 designator code with another air carrier for computer
14 reservation purposes or any other purpose; and

15 “(2) shall not, with respect to any flight for which
16 it is responsible, use or permit the use of the designa-
17 tor code of another air carrier to identify such flight for
18 any purpose.

19 “(d) REGULATIONS.—The Secretary shall prescribe
20 such regulations as the Secretary determines appropriate to
21 carry out this section.

22 “(e) DEFINITIONS.—In this section, the term—

23 “(1) ‘air carrier affiliate’ means any person who,
24 directly or indirectly, owns or controls an air carrier or
25 is owned or controlled by an air carrier;

1 “(2) ‘computer reservation systems’ means any
2 computerized or automated system which has the abili-
3 ty to allow a ticket agent, air carrier, or other person
4 to—

5 “(A) obtain information on routes, arrival
6 and departure schedules, and fares of flights of air
7 carriers; and

8 “(B) make reservations on flights of air carri-
9 ers or issue tickets for an air carrier; and

10 “(3) ‘designator code’ means the unique designa-
11 tion code allotted to an air carrier by the Secretary of
12 Transportation.”.

13 **FEDERAL TRADE COMMISSION AUTHORITY**

14 “SEC. 3. Section 5(a)(2) of the Federal Trade Commis-
15 sion Act (15 U.S.C. 45(a)(2)) is amended by striking “air
16 carriers and foreign air carriers subject to the Federal Avia-
17 tion Act of 1958,”.

18 **DOMINANT AIR CARRIERS**

19 SEC. 4. Section 411 of the Federal Aviation Act of
20 1958 (49 App. U.S.C. 1381) is amended by adding at the end
21 the following new subsection:

22 **“DOMINANT AIR CARRIERS**

23 “(c)(1) An air carrier operating aircraft at a concentrat-
24 ed hub airport shall be presumed to have been engaged in
25 unfair or deceptive practices or unfair methods of competition

1 in air transportation (or the sale thereof) if the air carrier is a
2 dominant air carrier at that airport.

3 “(2) In this subsection, the term—

4 “(A) ‘concentrated hub airport’ means an airport
5 that has 0.25 per centum or more of the total annual
6 enplanements in the United States and that is deter-
7 mined by the Secretary of Transportation to exceed
8 1800 on the Herfindahl-Hirschman Index as measured
9 in terms of market shares of passenger enplanements
10 on all air carriers other than charter air carriers; and

11 “(B) ‘dominant air carrier’ means an air carrier
12 whose aircraft at a concentrated hub airport have 40
13 per centum or more of the passenger enplanements at
14 the airport or an air carrier which is one of two air
15 carriers whose aircraft at a concentrated hub airport
16 together have 60 per centum or more of the passenger
17 enplanements at the airport; and

18 “(C) ‘Herfindahl-Hirschman Index’ means the nu-
19 merical index of market concentration calculated by
20 adding the squares of the individual market shares of
21 all the firms in a market.”.

22 INJUNCTION AUTHORITY

23 SEC. 5. Section 411(a) of the Federal Aviation Act of
24 1958 (49 App. U.S.C. 1381(a)) is amended—

25 (1) by inserting “(1)” immediately after “(a)”; and

1 (2) by adding at the end the following new para-
2 graph:

3 “(2) If the Secretary of Transportation has reason to
4 believe that any air carrier, foreign air carrier, or ticket agent
5 has been or is engaged in unfair or deceptive practices or
6 unfair methods of competition in air transportation (or the
7 sale thereof) and that enjoining such practices or methods
8 would be in the interest of the public, the Secretary may
9 bring suit in a district court of the United States to enjoin
10 such practices or methods. Any such suit shall be brought in
11 the district in which the air carrier, foreign air carrier, or
12 ticket agent resides or transacts business.”.

13 PASSENGER FACILITY CHARGES

14 SEC. 6. Section 1113 of the Federal Aviation Act of
15 1958 (49 App. U.S.C. 1513) is amended—

16 (1) by redesignating subsection (d) and any refer-
17 ence thereto as subsection (e);

18 (2) in subsection (a), by striking “No” and insert-
19 ing in lieu thereof “Except as provided in subsection
20 (d) of this section, no”; and

21 (3) by inserting immediately after subsection (c)
22 the following new subsection:

23 “(d)(1) Subject to the requirements of this section, the
24 operator of any concentrated hub airport may, to generate
25 revenue for security, capacity enhancement, and noise miti-

1 gation projects at such airport, assess a charge on passengers
2 enplaning at such airport.

3 “(2) No charge may be assessed under this section
4 unless the Secretary of Transportation has determined, after
5 notice and an opportunity for a hearing, that the proposed
6 assessment is in the public interest and in accordance with
7 the public convenience and necessity.

8 “(3) The Secretary of Transportation may issue such
9 regulations as the Secretary determines are appropriate to
10 carry out the provisions of this subsection.

11 “(4) In this section—

12 “(A) ‘concentrated hub airport’ means an airport
13 that has 0.25 per centum or more of the total annual
14 enplanements in the United States and that is deter-
15 mined by the Secretary of Transportation to exceed
16 1800 on the Herfindahl-Hirschman Index as measured
17 in terms of market shares of passenger enplanements
18 on all air carriers other than charter air carriers; and

19 “(B) ‘Herfindahl-Hirschman Index’ means the nu-
20 merical index of market concentration calculated by
21 adding the squares of the individual market shares of
22 all the firms in a market.”.

23 SLOT ALLOCATIONS

24 SEC. 7. (a) No later than one hundred eighty days after
25 the date of the enactment of this Act, the Secretary of Trans-

1 of part 93 of title 14, Code of Federal Regulations, to pro-
2 vide for the withdrawal and transfer, by auction, of slots held
3 by air carriers and foreign air carriers at high density traffic
4 airports.

5 (b) The final rule required to be implemented under sub-
6 section (a) shall be designed to enhance competition by en-
7 couraging the new entry of air carriers at high density traffic
8 airports and shall—

9 (1) provide for the periodic auction of such slots
10 for specific lengths of time;

11 (2) require that the holder of a slot make a speci-
12 fied minimum percentage of use of the slot and that if
13 the holder fails to meet such minimum use require-
14 ment, the slot shall be returned to the Secretary of
15 Transportation;

16 (3) include provisions designed to limit market
17 concentration at high density traffic airports;

18 (4) take into account the responsibilities of the
19 Secretary of Transportation with respect to small com-
20 munity air service under section 419 of the Federal
21 Aviation Act of 1958 (49 App. U.S.C. 1389) and the
22 international law and treaty obligations of the United
23 States; and

24 (5) include such other provisions and requirements
25 as the Secretary determines to be in the public interest

1 and in accordance with the public convenience and
2 necessity.

3 (c) The proceeds from any auction under the final rule
4 required to be implemented under this section shall be cred-
5 ited to the Airport and Airway Trust Fund established by
6 section 9502 of the Internal Revenue Code of 1986 (26
7 U.S.C. 9502), to be used for projects to enhance airport
8 capacity.

9 (d) As used in this section—

10 (1) the terms “air carrier” and “foreign air carri-
11 er” have the meaning given those terms in section 101
12 of the Federal Aviation Act of 1958 (49 App. U.S.C.
13 1301); and

14 (2) the term “high density traffic airport” means
15 any airport so designated under subpart K of part 93
16 of title 14, Code of Federal Regulations, including any
17 airport so designated following the date of enactment
18 of this Act.

○

APPENDIX B

THE HERFINDAHL-HIRSCHMAN INDEX

The Herfindahl-Hirschman Index (HHI) is a generic formula used for measuring industry concentration. It is calculated using the following formula:

$$HHI = \sum_{i=1}^n s_i^2$$

where s_i is the market share of the i^{th} firm.

A maximum value of 1 is obtained when there is a pure monopoly. When n increases, the value declines. Squaring market shares puts more weight on the large firm than the small. For example, if a city had only two competitors, but one had only 5% of the market, the HHI would be calculated as follows:

$$HHI = .05^2 + .95^2 = .905$$

where .05 and .95 are the companies' respective market shares. The HHI close to 1 indicates a near monopoly in spite of the presence of two firms. On the other hand, if the smaller firm had a 40% market share, the HHI would be:

$$HHI = .40^2 + .60^2 = .520$$

which indicates a healthier competitive environment [Ref. 29:p. 58].

The airline industry calculates HHI slightly differently. They change the decimal point so that a 40% market share is expressed 40, not .40 as above. Under this method, $n = 100\%$ and a monopoly is 10,000. On this scale, the following standards were set:

<u>HHI</u>	<u>Degree of Concentration</u>
Below 1,000	low
1,000 to 1,800	moderate
Over 1,800	high

The airline industry's method is not necessarily an accurate depiction of an airlines' dominance since concentrations are not measured by airport or region, but by an airline's nationwide market share. For example, if a regional airline wanted to buy a small commuter service, it might end up with an airport HHI of near monopoly level, but if nationally it only had 2% of the market, it could not be denied merger authority based on concentration. [Ref. 22:p. 131].

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