



Consumer Federation of America

**FREEING PUBLIC POLICY FROM THE DEREGULATION DEBATE:
THE AIRLINE INDUSTRY COMES OF AGE
(AND SHOULD BE HELD ACCOUNTABLE FOR ITS
ANTICOMPETITIVE BEHAVIOR)**

**DR. MARK N. COOPER
DIRECTOR OF RESEARCH
CONSUMER FEDERATION OF AMERICA**

Presented at
American Bar Association,
Forum on Air and Space Law: The Year In Aviation
Session on
Domestic Aviation Policy I:
Does Competition Need More Policing

January 22, 1999

I. INTRODUCTION

The airline industry stands at the forefront of a quarter of a century that will be remembered as the age of economic reform in which government regulation was replaced by reliance on market forces in a number of industries.¹ After two decades of experience, however, the airline industry continues to confront policy makers with a mixed message.² The industry has experienced a great deal of turbulence in its economic organization and performance.³ Competition has come in fits and starts in the industry, so that public policy analysis oscillates between worry about excessive concentration and destructive competition.⁴ Financial performance has been extremely uneven, raising concerns on some occasions about bailing the whole industry out.⁵ Concerns about financial incentives to cut quality at the expense of safety have been a continual theme of public comment.⁶

Having reached maturity (deregulation will be 21 years old in 1999), the industry should be held responsible for its actions. Last year, after two decades of both efficiency gains and mounting evidence of the abuse of market power, the federal government finally discovered that it was time to impose a little discipline.

- The Department of Transportation proposed a creative set of rules to prevent price predation at hub airports.⁷
- The Department of Justice decide that concentration in the airline industry had become too great and that some mergers just could not be approved.⁸
- In the U.S. and abroad, authorities responsible for protection competition have sought to impose remedies on the American Airlines/British Airways Alliance.⁹

Predictably, the industry resisted. First, it convinced Congress to go prevent DOT from implementing its rule to protect competition. Next, one of its dominant firms went ahead with a merger, forcing the DOJ to go to court to stop it.

After twenty years, the public policy debate over deregulation has entered a new phase. It is none too soon. From the consumer point of view, the intense, ideological debate over deregulation that has taken place in this country over the past three decades has had a major, negative impact on public policy regarding the industrial organization of formerly regulated industries. Instead of crafting careful public policies that promote competition while restricting the abuse of market power, regulators have been largely immobilized. The pure efficiency gains that have clearly been made as a result of deregulation have been polluted by rampant abuse of market

power. The performance of the deregulated industries certainly improved, but not nearly as much as it could have from the captive consumer point of view.

One of the difficulties in assessing the impact of deregulation lies in the assumptions one makes about how those industries would have performed if policy had not been changed. There are two critical difficulties in such an analysis. First, exogenous changes, such as fuel prices, normal growth (income) and technological change would have taken place. In the airline industry one can argue that much of the benefit claimed for deregulation would have taken place due to these external factors. Second, the behavior of regulators can change incrementally, absent total deregulation, and some efficiency gains result from improvements in regulation. Much of the gain that has taken place under deregulation has been propelled by market forces that are so powerful that even near-sighted regulators would have seen them and accommodated them.

The uncertainties about what would have happened under continued regulation have resulted in endless debates over the impact of deregulation. At one end of the spectrum, advocates of deregulation refuse to accept the fact that problems do arise, for fear that such an admission will be used to convince policymakers that reregulation should be tried. At the other end of the spectrum, the advocates of regulation refuse to acknowledge that efficiency improvements flow from deregulation, for fear that such an admission will be used to prevent policy makers from addressing the specific problems that arise. What gets lost in the middle is good public policy.

This paper reviews the overwhelming empirical evidence that, in fact, market power has been and can be abused in the airline industry with an eye toward refocusing the policy debates in deregulated industries. There appears to be one fairly clear message in the rich empirical analysis of the past two turbulent decades in the airline industry that should influence the debate ahead.

- Where and when competition exists, consumers benefit; where and when it does not, they suffer.

Thus future debate should not be about whether to return to the old-school, price and quantity regulation of the middle of the century, but about how policy can increase public welfare by promoting competition and preventing anti-competitive actions.¹⁰

II. TWO DECADES OF ECONOMETRIC EVIDENCE

The analysis in this paper applies the Structure – Conduct - Performance (SCP) approach to industry analysis (Scherer and Ross, p. 4). The SCP approach has been the dominant public policy paradigm in the United States for the better part of this century. The elements of the approach can be described as follows.

First, our central concern is with market performance, since that is the outcome that affects consumers most directly. The concept of performance is multifaceted. It includes efficiency, innovativeness and fairness. The measures of performance to which we look are pricing, profits, choice and innovativeness.

Pricing and profits address issues both of efficiency and fairness. They are the most direct measure of how society's wealth is being allocated and distributed.

Choice and innovativeness are frequently cited as indirect measures of performance. If consumers lack choices, it is generally felt that they will not be able to meet their needs effectively and efficiently. If consumer choice is not sovereign, producers will not be driven to innovate, improve quality, or lower price.

The performance of industries is determined by a number of factors, most directly the conduct of market participants. Do they compete? What legal tactics do they employ? How do they advertise and price their products?

Conduct, in turn, is affected and circumscribed by market structure. Here we look at the number and size of the firms in the industry, their cost characteristics and barriers to entry, as well as the basic conditions of supply and demand. Structure is the foundation of the analysis.

A. STRUCTURE

Identification of exactly where a small number of firms can exercise this power is not a precise science. Generally, however, when the number of significant firms falls into the single digits, there is cause for concern, as the following suggests.

Where is the line to be drawn between oligopoly and competition? At what number do we draw the line between few and many? In principle, competition applies when the number of competing firms is infinite; at the same time, the textbooks usually say that a market is competitive if the cross effects between firms are negligible. Up to six firms one has oligopoly, and with fifty firms or more of roughly equal size one has

competition; however, for sizes in between it may be difficult to say. The answer is not a matter of principle but rather an empirical matter.¹²

The clear danger of a market with a structure equivalent to only six equal sized firms was recognized by the Department of Justice in its Merger Guidelines.¹³ These guidelines were defined in terms of the Herfindahl-Hirschman Index (HHI). This measure takes the market share of each firm expressed as a percentage, squares it and sums the result.

A market with six, equal-sized firms would have a HHI of 1667. The Department declared any market with an HHI above 1800 to be highly concentrated. Thus, the key threshold is at about the equivalent of six or fewer firms. Another way that economists look at a market at this level of concentration is to consider the market share of the largest four firms (4-Firm concentration ratio). In a market with six, equal-sized firms, the 4-Firm concentration would be 67 percent. The reason that this is considered an oligopoly is that with that small a number of firms controlling such a large market share, their ability to avoid competing with each other is clear.

Shepherd describes this threshold as follows:¹⁴

Tight Oligopoly: The leading four firms combined have 60-100 percent of the market; collusion among them is relatively easy.

However, as the above quote indicates, one must have many more firms than six to be confident that competition will prevail -- perhaps as many as fifty. Reflecting this basic observation, the Department of Justice established a second threshold to identify a moderately concentrated market. This market was defined by an HHI of 1000, which is equivalent to a market made up of 10 equal sized firms. In this market, the 4-Firm concentration ratio would be 40 percent.

Shepherd describes this threshold as follows:

Loose Oligopoly: The leading four firms, combined, have 40 percent or less of the market; collusion among them to fix prices is virtually impossible.¹⁵

Bates summarizes Shepherd's discussion in terms of HHI indexes as follows:¹⁶

Following guidelines proposed by Shepherd, one could roughly identify markets with $HHI > 1500$ as tight oligopolies, and those with $HHI < 1000$ as loose oligopolies.

Even the moderately concentrated threshold of the Merger Guidelines barely begins to move down the danger zone of concentration from 6 to 50 equal sized firms. In other words, in simple economic markets levels of concentration typified by 10 equal sized firms are high enough to raise questions about the competitive behaviors of the firms in the market.

The Consumers Association (1995) argues that airline markets may behave somewhat differently. It cites evidence that having at least three competitors is the key threshold for airline competition.

By these definitions, airline markets are generally highly concentrated. Generally, we find that most routes have fewer than four carriers. National averages typically find HHI's in the range of 4000 on a city-pair basis.¹⁷ One recent study found that measured at airports the HHI was just under 3300 -- the equivalent of three airlines per airport), but measured by city pairs the HHI was over 5000 -- the equivalent of two per route (Hayes and Ross). Given such a high level of concentration, we should not be surprised to find that anti-competitive behavior and changes in market structure have a significant impact on fares. Exercising market power is easy in such highly concentrated markets.

Econometric studies of market structure have consistently shown that concentration on routes, at airports, and in the industry at large are associated with higher fares (see Table 1). Analysis of specific events -- entry, exit and mergers -- confirms these findings. Estimates of the general impact of competition on price are on a similar order of magnitude. For example, Dresner and Trethaway compare liberalized markets to non-liberalized markets and conclude that prices are 35 percent lower in liberalized markets. At least some estimates of the impact of serious reductions in competition are of this order of magnitude. Several GAO studies have found effects of this order of magnitude. DOT's estimates are somewhat lower.

Similarly, estimates of the elimination or addition of one competitor have been made. Generally these estimates bracket the more general studies of concentration. The impact of a low cost competitor is particularly pronounced. When specific low cost carriers are identified, like People's or Southwest, the fare impact is in the range of 35 to 40 percent. Thus, having one additional competitor impacts prices by 20 to 40 percent.

TABLE 1

THE IMPACT OF ANTI-COMPETITIVE MARKET STRUCTURE ON FARES

STUDY	PRACTICE	PERCENT INCREASE IN PRICE
GENERAL MEASURES OF COMPETITION		
Dressner and Trethaway	Competition	35
GAO (1993)	Hub Concentration	33
GAO (1996)	Hub Concentration	31
DOT (1996)	Hub Concentration, 1989	19
	1994	19.7
	1995	22.1
CHANGE IN NUMBER OF COMPETITORS		
Strassman	Add one (2.7 to 3.7)	44
Hurdle (et al.)	Loss of one	20
Windle and Dressner	Add one (2-3)	17
Oum, Zhang and Zhang	Add one (1-2)	17
Borenstein (1989)	Add one (1-2)	8
ENTRY AND EXIT		
Dressner and Windle	Low cost (Southwest)	35
Whinston and Collins	Low cost (Peoples)	34
DOT (1996)	Low Cost (all Hubs)	35
	Low Cost (Concentrated Hub)	40
Joskow et al.	Any	10
GENERAL INDUSTRY PRACTICES		
Morrison and Winston (1995)	Hubbing	5.4
	Frequent Flier	7.9
	CRS Manipulation	9.4
	(Subtotal)	22.7
	Fare restrictions	23.8
	Total	46.5
Stavins (1996)	Fare restrictions	20-40

C. Conduct

The centerpiece of industry structure in the deregulated environment -- the hub and spoke network -- is a constant source of public policy concern. Advocates of deregulation failed to anticipate the development of this form of industrial organization.¹⁸ While they may have recognized the possibility that competition would not develop on lightly traveled routes or at small airports,¹⁹ the notion that single airlines would come to dominate and control huge airports as fortress hubs would have been unthinkable. As a result, there has been a vigorous effort to understand why the industry has organized itself in this way.

Part of the complexity of the analysis stems from the fact that the characteristics of hubs that appear to confer market power are both “positive” and negative. Just as competition can create efficiencies so too can hub and spoke networks. The key characteristics include economies of scale and operating efficiencies, as well as marketing advantages that make it extremely difficult for competitors to enter.

- The concentration of traffic at hubs allows incumbents to achieve lower costs.²⁰
- The concentration of traffic and prominent position in the hub enables the incumbent to achieve both a greater reputation and to offer a broader range of options at the hub.²¹
- Advertising and promotion are facilitated.²²
- Scheduling and baggage handling are better coordinated.²³

Unfortunately, the story does not stop with these positive aspects of industry organization. In practice these “positive” economic advantages of hub and spoke networks have been immediately leverage with anti-competitive actions to increase and exploit market power by incumbents dominating hubs. Incumbents create barriers to entry by locking in customers and disadvantaging competitors in a variety of ways.

Traffic is diverted to the dominant incumbents through a number of marketing mechanisms that extends market power over travelers. These

- frequent flier programs,²⁴
- deals with travel agents to divert traffic,²⁵

- manipulation of computerized reservation systems,²⁶
- code sharing,²⁷ and
- general policies of market segmentation.²⁸

The ability of competitors to enter hubs is undermined in a number of ways. Access to facilities is impeded through a number of mechanisms that preclude or raise the cost of entry.²⁹ These mechanisms include:

- denial of gate space,³⁰
- extraction of excess profits on facilities,³¹
- the inability of entrants to attract adequate passengers to establish a presence.³²

Having gained this advantage, the incumbents can raise price, without risking entry.³³

- Prices at hubs are higher.³⁴
- Profits at hubs are higher.³⁵

Studies that try to decompose the market power associated with specific practices -- hubbing, manipulation of computerized reservations systems, frequent flier programs -- also reach similar conclusions. For example, Morrison and Winston (1995) estimate the impact of four different purportedly anti-competitive practices identified in Table 1. The first three items -- hubbing, frequent flier programs and CRS bias -- are the major anti-competitive aspects of industry structure and behavior. These three probably capture a great deal of what other analysts calculate in general assessments of market concentration. The fourth item incorporates very general characteristics of industry structure. Thus, Morrison and Winston identify a small impact of hubbing alone, but others have not disaggregated the overall effects of industry structure. Petraf (1995) finds an effect of CRS bias of a similar order of magnitude.

C. Performance

Competition leads to lower prices and higher output. This is true no matter how competition is measured. The effect is observable at the micro level in the form of the entry of individual airlines into specific markets¹¹ and at the macro level in the form of generalized concentration ratios.³⁶

Flowing from this basic observation, we find support for a number of traditional observations about public policy. Actual competition is vastly more important than the threat of competition.³⁷ Barriers to entry play a critical role in determining the level and nature of competition.³⁸ Mergers tend to reduce competition, increase prices and lower output.³⁹

Therefore, it is clear that competition can serve the public in the airline industry. Policies to promote competition and reduce barriers to entry or prevent anti-competitive behavior are in the public interest. Unfortunately, we come to this observation because competition has been very uneven in the industry and the industry performs poorly where competition is lacking. Thus, the dilemma of public policy emerges. The problem is how to allow airlines to capture efficiencies while preventing them from abusing market power.

III. EMPIRICAL JUSTIFICATION FOR RECENT FEDERAL ACTIONS

The recent actions by federal regulators are clearly consistent with this body of empirical evidence on the performance of the airline industry. Moreover, it was critically necessary for federal regulators to take action because specific actions threaten to worsen the competitive conditions in the airline market substantially.

A. Structure

B.

Industry structure has become sufficiently concentrated to raise a fundamental question about whether market forces are sufficient to prevent the abuse of market power. Both at individual hubs and in the industry as a whole, markets have or would become highly concentrated. Attorney's General from 25 states filed comments in support of the Department of Transportation's anti-predation rule which identified 15 airports at which the dominant firm had a market share in excess of 70 percent (see Table 2).⁴⁰ This is the standard generally applied to indicate monopoly status. This is not a small airport problem. Six of the ten busiest airports in the country are on the list. Over one-third of all passenger enplanements took place at these airports.

Moreover, the monopolized airports are building blocks of potential national market power through concentration of the national industry. For example, major pending merger/alliances include five of the nation's busiest airports and eleven fortress hubs. The nationwide problem is also readily apparent in the proposals to further concentrate the industry. The monopolies are reinforced by an industry structure that had become moderately concentrated, prior to the proposals for mergers

TABLE 2

DOMINANT AIRLINES PROPOSING GREATER CONCENTRATION
WITH FORTRESS HUBS THAT EXCEED MONOPOLY STANDARD

AIRPORT	AIRLINE	DOMINANT FIRM MARKET SHARE
ATLANTA	DELTA	79%
CHARLOTTE	US AIRWAYS	90
CINCINNATI	DELTA	90
DALLAS FT. W	AMERICAN	70
DENVER	UNITED	70
DETROIT	NORTHWEST	79
HOUSTON INTL	CONTINENTAL	79
MEMPHIS	NORTHWEST	79
MINNEAPOLIS	NORTHWEST	82
PITTSBURGH	US AIRWAYS	89
SALT LAKE	DELTA	72

Source: Attorneys General

and alliances (see Table 3). Each of the pending consolidations (Northwest-Continental; United Delta and American US Airways) would violate the Merger Guidelines. Taken together, they drive the industry structure well above the highly concentrated level. The DOJ simply cannot allow that level of concentration to come about.

TABLE 3

IMPACT OF PROPOSED MERGERS/ALLIANCES ON
CONCENTRATION IN THE NATIONAL AIRLINE INDUSTRY

	HHI	4-FIRM SHARE
PRE-MERGER	1189	61
INCREASE IN CONCENTRATION		
NORTHWEST CONTINENTAL	135	8
AMERICAN-US AIR	272	8
UNITED-DELTA	612	0

POST-MERGER MARKET

2208

77

Source: Attorneys General

B. Conduct

The Attorneys General also identify six specific airlines and at least thirteen routes (from major fortress hubs) in which predatory conduct drove competitors from the market (see Table 4). In each case, one of the airlines proposing to merge was involved in the anti-competitive behavior.

TABLE 4

INSTANCES OF DRIVING ENTRANTS FROM FORTRESS HUB MARKETS

ENTRANT	NUMBER OR MARKETS	DOMINANT INCUMBENTS
VANGUARD	2	UNITED, AMERICAN
RENO	3	NORTHWEST
SPIRIT	1	NORTHWEST
FRONTIER	4	UNITED
WESTERN PACIFIC	1	AMERICAN
VALUE JET	2	DELTA

Source: Source: Attorneys General

The dominant firm cuts its fares and adds capacity when the new entrant shows up. Once the entrant is driven out of the market, capacity is reduced and fares are increased.

C. Performance

Examples of clearly abusive pricing are also too frequent and too blatant to ignore. The Attorney's General give three types of examples where fares differ by \$700 or more (see Table 5).

- Nearby Airports with dramatically different levels of competition originate flights to the same destination.

- One airport originates flights to destination. airports with dramatically different levels of competition.
- Prices before and after a competitor is driven from the market.

TABLE 5

ANNECDOTAL EVIDENCE ON PRICING ABUSE

	COMPETITIVE	MONOPOLY
Nearby Airports with dramatically different levels of competition originate flights to the same destination	\$245	\$1105
One airport originates flights to destination Airports with dramatically different levels of Competition	\$224	\$908
Prices before and after a competitor is driven from the market	\$122	\$843
	\$70	\$800
Source: Source: Attorneys General		

The econometric and anecdotal evidence is supported by a general trend in prices (see Figure 1). Airfares, as measured by the consumer price index have increased dramatically, particularly when key components of airline costs are taken into account. Since the mid-1980s, fuel prices have dropped by almost 50 percent. The cost of capital (measured by AAA corporate bonds) has declined by 20 percent. These are two of the three largest costs for airlines. Yet, airfares have mounted steadily.

IV. CONCLUSION

With two decades of econometric evidence about competitive problems at the levels of structure, conduct and performance reinforced by detailed analysis of recent events, one can only hope that the public policy debate will not revert to the irrelevant question of whether deregulation served the consumer interest. The trigger for public policy concern is, as it has always should have been, whether anticompetitive practices are hurting consumers. By every measure, the airlines are failing that test at present.

ENDNOTES

1. The major milestones in infrastructure industries including transportation, energy and communications are as follows: 1976 trucking, 1978 airlines, 1978 and 1985 natural gas, 1978 and 1992 electricity, 1980 busses, 1980 1994 railroads, 1996 telecommunications. The Civil Aeronautics Board was the first of the economic regulatory agencies to be abolished, over a decade before the Interstate Commerce Commission. Supreme Court Justice Stephen Breyer, who participated in the airline deregulation debate as a Senate Staff member, uses airlines as one of the examples of deregulation, see Breyer, 1990.
2. Since the early days of deregulation, the Consumer Federation of America (1987, 1989, 1991) has urged policymakers not to “reregulate” the industry, but to vigorously pursue policies to promote competition and provide consumer protections. Kahn, 1992, refers to airline deregulation as a “mixed bag.”
3. The National Commission to Ensure A Strong Competitive Airline Industry, 1993 (hereafter National Commission).
4. Rakowski and Bejou, 1992.
5. Starting in 1978, Morrison and Winston (1995) show two years of profits, three years of loss, seven years of profits, three years of loss and one year of profits; see also National Commission.
6. Each air crash, particularly by low cost or financially distressed carriers, raises questions about the willingness of safety regulators to look the other way in order to keep airlines competing - see McCartney, 1996, for a discussion of the impact of the ValueJet decertification. For a brief discussion see also Transportation Research Board, 1991.
7. Department of Transportation, Docket No. OST 98-3713.
8. Department of Justice.
9. Consumer Federation of America, 1997.
10. Morrison and Winston, 1995, persist in focusing on what regulators would have done, almost two decades after regulation was ended, instead of asking the relevant public policy question, what would happen if the industry did not exhibit anti-competitive practices and tendencies.
11. The impact of the entry of low cost airlines has been extensively studied -- see Graham and Kaplan (1985), Strassman (1990), Whinston and Collins (1992), Bennet and Craun (1993), Windle and Dresner (1995), Morrison and Winston (1995), Dresner and Windle (1996), U.S. DOT (1996) . Analysis of entry by any carrier, as distinguished from specific examples of low cost carriers, reaches a similar conclusion, see Call and Keeler (1985) and Joskow, et al., (1994).
12. Friedman, 1983, pp. 8-9.

13. DOJ, 1984.
14. Shepherd, 1985, p. 4.
15. Shepherd, 1985, p. 4.
16. Bates, B. J. 1993, p. 6.
17. See for example, Dresner, Lin and Windle (1996). City-pair markets generally include all flights between to points including direct and connecting (single airline) flights.
18. Rakowski and Bejou (1992), Oum Zhang and Zhang (1995).
19. The unique problems of small airports and low density routes were recognized in the legislation ending the existence of the CAB -- see Meyer and Oster (1984) and Malloy (1985)
20. Johnson (1985), McShane and Windle (1989), Oum and Trethaway (1990), Berry (1990), Morrison and Winston (1990), Oum (1991), Berry (1992), Boucher and Spiller (1994), Joskow, et al (1994).
21. Levin (1987), Bornstein (1989, 1992), Zhang (1996).
22. Evans and Kessides (1993).
23. Oum and Taylor (1995).
24. Levine (1987), Oum (1987), Borenstein (1989), Layer (1989), GAO (1996).
25. Levine (1987), Borenstein (1989, 1991, 1992), Morrison and Winston (1995).
26. Oster and Pickerell (1986), Borenstein (1989), Layer (1989), Brenner (1989), Evans and Kessides (1993).
27. Oum (1995) identifies three positive advantages created by code sharing -- increased frequency of flights, concentration of traffic, marketing of single line travel -- and one negative -- CRS placement advantages due to frequency and single line service.
28. Borenstein (1989) notes that by segmenting markets incumbents can diminish the impact of competition at hub airports. Evans and Kessides (1993), Oum and Zhang (1993), and Mallaiebiau and Hansen (1995) observe a generally low elasticity of demand across all markets.
29. Berry (1987), Levine (1987), Borenstein (1989), Butler and Houston (1989), Reiss and Spilber (1989), Oum, Zhang and Zhang (1995), and Hendricks (1995).
30. Levine (1987), Borenstein (1989), Kahn (1993), GAO (1996).
31. GAO (1996).
32. Credible entry requires the entrant to move sufficiently up the S-curve to have a viable economic base (Russon (1992), Vakil and Russon (1995). GAO notes that entrant require at least six slots at prime times to establish a credible presence.
33. The fact that higher prices persist at hubs is evidence of the ability to sustain prices. Direct tests of the entry decision also support this notion (see, for example, Joskow et al (1994)).

34. Bailey and Wilkins (1988), Huston and Butler (1988), Borenstein (1989), Evans and Kessides (1993), Joskow, et al. (1994), GAO (1996), DOT (1996).

35. Toh and Higgins (1985), McShane and Windle (1989).

36. A broad range of studies includes the Herfindahl index as a measure of concentration. These invariably find that higher levels of concentration are associated with higher prices, all other things equal -- see, for example, Morrison and Winston (1986), Borenstein (1989), Dresner and Trethaway (1992), Dresner and Windle (1996).

37. Graham, Kaplan and Sibley (1983), Call and Keeler (1985), Morrison and Winston (1986), Moore (1986), Strassman (1990), Petraf (1994), Petraf and Reed (1994), provide evidence on actual competition. Tests of potential competition have generally shown much smaller effects. The evidence suggests that one competitor in the hand is worth between three and six in the bush. The empirical evidence from the airline industry must be considered a thorough repudiation of contestability theory. On this point see Borenstein (1989), Butler and Houston (1989), Hurdle (1989), Abbott and Thompson (1991).

38. The clearest examples of the importance of barriers to entry are the consistent finding that physical limitations on slots and gates result in less competition and higher prices. Virtually every econometric analysis includes a slot variable which supports this conclusion -- see, for example, Morrison and Winston (1986, 1990), Hurdle (1989), Whinston and Collins (1992), Windle and Dresner, 1995, and Dresner, Lin and Windle (1996). Analysis of legal barriers reaches similar results -- see Dresner and Trethaway (1992), Burton (1996).

39. See, for example, Borenstein (1990), Werden et al. (1991), and Morrison and Winston (1995).

40. "Comment of the Attorneys General of the States of Arkansas, Connecticut, Florida, Iowa, Kansas, Massachusetts, Michigan, Minnesota, Missouri, Montana, Nevada, New York, North Carolina, North Dakota, Oklahoma, Oregon, South Dakota, Tennessee, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, and Wyoming," U.S. Department of Transportation, 1998, Docket No. OST 98-3713 (hereafter, Attorneys General).

BIBLIOGRAPHY

Allvine, Fred C., "Predatory Pricing and 'Fortress Hubs': Monopolization in the Airline Industry," 1997, Antitrust Law and Economics

Baker, S. H. and J. B. Pratt, 1989, "Experience as a Barrier to Contestability," Review of Economics and Statistics.

Bates, B. J., 1993, "Concentration in Local Television Markets," Journal of Media Economics.

Bennett, R.D. and J. M. Craun, 1993, The Airline Deregulation Evolution Continues: The Southwest Effect.

Berechman, J. and O. Shy, 1996, "Airport Deregulation and the Choice of Networks," in P. Nijkamp (ed.), Advances in Spatial Equilibrium, Berlin: Springer Verlag.

Berechman, J. and J. de Wit, 1996, "An Analysis of the Effects of European Aviation Deregulation on an Airline's Network Structure and Choice of a Primary European Airport Hub," Journal of Transport Economics and Policy.

Berry, S. T., 1992, "Estimation of a Model of Entry in the Airline Industry," Econometrica.

Berry, S. T., 1990, "Airport Presence as Product Differentiation," AEA Papers and Proceedings.

Borenstein, S., 1989, "Hubs and High Fares: Dominance and Market Power in the U.S. Airline Industry," Rand Journal of Economics.

- Borenstein, S., 1990, "The Dominant Firm Advantage in Multi-Product Industries: Evidence of the U.S. Airlines," Quarterly Journal of Economics.
- Borenstein, S., 1990, "Airline Mergers, Airport Dominance, and Market Power," AEA Papers and Proceedings.
- Brander, J.A. and A. Zhang, 1990, "Market Conduct in the Airline Industries: An Empirical Investigation," Rand Journal of Economics.
- Brander, J.A. and A. Zhang, 1993, "Dynamic Oligopoly Behavior in the Airline Industry," International Journal of Industrial Economics.
- Brenner, M. A., 1989, "Action Needed to Correct Pricing and Service Distortions of Airline Deregulation," American Economic Review.
- Breyer, S., 1990, "Regulation and Deregulation in the United States: Airlines, Telecommunications and Antitrust," in G. Majone (ed), Deregulation or Re-Regulation: Regulatory Reform in Europe and the United States, St. Martins.
- Brooks, M. and K. J. Button, "Yield Management: A Phenomenon of the 1980s and 1990s?" International Journal of Transport Economics.
- Brueckner, J. K. and P. T. Spiller, 1991, "Competition and Mergers in Airline Networks," International Journal of Industrial Organization.
- Brueckner, J.K, N.J. Dyer and P.T. Spiller, 1992, "Fare Determination in Airline Hub-and-Spoke Networks," Rand Journal of Economics.
- Butler, R.V. and J. H. Huston, 1989, "How Contestable are Airline Markets?," Atlantic Economic Journal.
- Button, K. 1996, "Liberalizing European Aviation," Journal of Transportation Economics and Policy.
- Call, G. D. and T. E. Keeler, 1985, "Airline Deregulation, Fares, and Market Behavior: Some Empirical Evidence, in f. Daugherty, ed., Analytic Studies in Transport Economics (Cambridge University Press).
- Consumers' Association, 1996, Consumers' Association Comments on the Proposed Alliance Between British Airways and American Airlines.
- Consumer Federation of America, 1987, The Downsides of Deregulation: A Consumer Perspective after a Decade of Regulatory Reform, Remarks of Dr. Mark Cooper, Director of Research, Consumer Assembly.
- Consumer Federation of America, 1989, "Testimony of Dr. Mark Cooper, Director of Research on Airline Competition," Subcommittee on Aviation, Commerce, Science and Transportation Committee, United States Senate.
- Consumer Federation of America, 1991, "Testimony of Dr. Mark Cooper, Director of Research on Airline Competition and Consumer Protection," Subcommittee on Aviation, Committee on Public Works Transportation U.S. House of Representatives.
- Consumer Federation of America, 1997, Open Skies: Closed Airports: The Impact of the British Airways-americanAirlines Merger on TransAtlantic Travel.
- Dresner, M. and M. W. Threthaway, 1992, Modeling and Testing the Effect of Market Structure on Price: The Case of International Air Transport, University of Maryland.
- Dresner, M. and R. Windle, The Liberalization of US International Air Policy: Impact on US Markets and Carriers, University of Maryland.

- Dresner, M., J. C. Lin and R. Windle, 1996, "The Impact of Low-Cost Carriers on Airport and Route Competition," Journal of Transport Economics and Policy.
- Evans, W. N. and I. A. Kessides, 1993, "Localized Market Power in the Airline Industry," Review of Economics and Statistics.
- Friedman, J.W., 1983, Oligopoly Theory, Cambridge University Press.
- Good, D. H., L. Roller and R. C. Sickles, 1993, "US Airlines Deregulation: Implications For European Transport," The Economic Journal.
- Graham, D. R., D. P. Kaplan and D. S. Sibley, 1983, "Efficiency and Competition in the Airline Industry," Bell Journal of Economics.
- Hayes, Kathy J. and Leola B. Ross, "Is Airline Price Dispersion the Result of Careful Planning or Competitive Forces?," 1998, Review of Industrial Organization.
- Hendricks, K., M. Piccione and G. Tan, 1995, "The Economics of Hubs: The Case of Monopoly," Review of Economic Studies.
- Hurdle, et al., 1989, "Concentration, Potential Entry, and Performance in the Airline Industry," Journal of Industrial Organization.
- Jordan, W. A., 1989, "Problems Stemming from Airline Mergers and Acquisitions," Transportation Journal.
- Jorge-Calderon, J.D., 1996, "Evaluating the Effectiveness of Airline Operation Strategies in UK International Markets," International Journal of Transport Economics.
- Joskow, A. S., et al., 1994, "Entry, Exist and Performance in Airline Markets," International Journal of Industrial Organization.
- Kahn, A.E., 1992, "Airline Deregulation: A Mixed Bag but a Clear Success," Transportation Journal.
- Kahn, A. E., 1993, "The Competitive Consequences of Hub Dominance: A Case Study," Review of Industrial Organization.
- Kling, J. A. and K. A. Smith, 1995, "Identifying Strategic Groups in the U.S. Airline Industry: An Application of the Porter Model," Transportation Journal.
- Layer, C.R., 1989, "The Next Decade Belongs to the Airlines Unless...," Transportation Quarterly.
- Levine, M.E., 1987, "Airline Competition in Deregulated Markets: Theory, Firm Strategy, and Public Policy," Yale Journal on Regulation.
- Malloy, J. F., 1985, The U.S. Commuter Airline Industry, Lexington Books.
- Meyer, J. R. And C. V. Oster, 1984, Deregulation and the New Airline Entrepreneurs, MIT Press.
- McShane, S. and C. Windle, 1989, "The Implications of Hub and Spoke Routing for Airline Costs and Competitiveness," Logistics and Transportation Review.
- Mallaiebiau E., and Mark Hansen, 1994, "Demand and Consumer Welfare Impacts of International Airline Liberalization," Journal of Transport Economics and Policy.

- McCartney, S., 1996, "Air Pressure: Start-Ups Still Suffer from ValuJet Crash and FAA's Missteps," Wall Street Journal, December 9.
- Moore, T. G., 1986, "U.S. Airline Deregulation: Its Effects on Passengers, Capital, and Labor," Journal of Law and Economics.
- Morrison, S. A. and C. Winston, 1986, The Economic Effects of Airline Deregulation, Brookings, Washington, D. C.
- Morrison, S. A. and C. Winston, 1987, "Empirical Implications and Tests of the Contestability Hypothesis," Journal of Law and Economics.
- Morrison, S. A. and C. Winston, 1989, "Enhancing the Performance of the Deregulated Air Transportation System," Brookings Papers on Microeconomics.
- Morrison, S. A. and C. Winston, 1990, "Deregulated Airline Markets: The Dynamics of Airline Pricing and Competition," AEA Papers and Proceedings.
- Morrison, S. A. and C. Winston, 1995, The Evolution of the Airline Industry, Brookings, Washington, D.C.
- Morrison, S. A., 1996, "Airline Mergers: A Longer View," Journal of Transport Economics and Policy.
- Ott, J. and R. E. Neidl, 1995, Airline Odyssey, McGraw Hill.
- Oum, T. H., D. W. Gillen, and S. E. Nebble, 1986, "Demand for Fareclass and Pricing in Airline Markets," Logistics and Transportation Review.
- Oum, T. H., W. G. Waters and J. Yong, 1992, "Concepts of Price Elasticity of Transport Demand and Recent Empirical Estimates," Journal of Transport Economics.
- Oum, T. H., A. Zhang and Y. Zhang, 1993, "Inter-Firm Rivalry and Firm-Specific Price Elasticities in Deregulated Airline Markets," Journal of Transport Economics and Policy.
- Oum, T. H., A. Zhang and Y. Zhang, 1995, "Airline Network Rivalry," Canadian Journal of Economics.
- Oum, T. H. and A. J. Taylor, 1995, "Emerging Patterns in Intercontinental Air Linkages and Implications for International Route Allocation Policy," Transportation Journal.
- Oum, T. H., J. Park and A. Zhang, 1996, "The Effects of Airline Codesharing Agreements on Firm Conduct and International Airfares," Journal of Transport Economics and Policy.
- Petraff, M. A. and R. Reed, 1994, "Pricing and Performance in Monopoly Airline Markets," Journal of Law and Economics.
- Petraff, M. A., 1995, "Sunk Costs, Contestability and Airline Monopoly Power," Review of Industrial Organization.
- Rakowski, J.P. and David Bejou, 1992, "Birth, Marriage, Life and Death: A Life-Cycle Approach for Examining the Deregulated U.S. Airline Industry," Transportation Journal.
- Reiss, P. and P. Spiller, 1989, "Competition and Entry in Small Airline markets," Journal of Law and Economics.
- Shepherd, W.G. 1985, The Economics of Industrial Organization, Prentice Hall.
- Strassman, D.L., 1990, "Potential Competition in the Deregulated Airlines," Review of Economics and Statistics.

The National Commission to Ensure A Strong Competitive Airline Industry, 1993, A Report to the President: Change, Challenge, and Competition, Washington, D.C.

Town, R. and S. Milliman, 1989, "Competition in Deregulated Airline Fares," in L. W. Weiss (ed.), Concentration and Price, Cambridge, MIT Press.

Transport Committee, House of Commons, 1996, The Proposed Alliance Between British Airways and American Airlines, Sixth Report: Report and Minutes of Proceedings, Session 1995-1996.

Transportation Research Board, 1991, National Research Council, Winds of Change, Special Report 230.

Transworld Airlines, Inc., 1996, Market Effects of the Proposed American Airlines/British Airways Alliance, GRA, Incorporated.

U.S. Department of Justice, Merger Guideline, revised, 1984.

U.S. Department of Transportation, 1993, The Airline Deregulation Evolution Continues: The Southwest Effect, Washington, D. C.

_____, 1996, The Low Cost Airline Service Revolution, Washington, D.C.

_____, 1998, Docket No. OST 98-3713.

U.S. General Accounting Office, 1990, Airline Competition: Industry Operating and marketing Practices Limit Market Entry, Washington, D.C.

_____, 1991, Airline Competition: Effects of Airline Market Concentration and Barriers to Entry On Airfares, Washington, D.C.

_____, 1996, Airline Deregulation: Barriers to Entry Continue to Limit Competition in Several Key Domestic Markets, Washington, D.C.

Vakil, F. And M. G. Russon, 1996, "Enplaned Passenger Flight Frequency Functions for Short Hauls Air Transport Passenger Flows," Logistics and Transportation Review.

Virgin Atlantic Airways Limited, 1996, Presentation to the House of Commons Transport Select Committee in Opposition to the Proposed Alliance Between British Airways and American Airlines.

Werden, G.J., A.S. Joskow and R. L. Johnson, 1989, "The Effects of Mergers on Economic Performance: Two Case Studies from the Airline Industry," U. S. Department of Justice Discussion Paper, No. EAG 89-15.

Windle, R. and M. Dresner, 1995, "Airport Choice in Multiple Airport Regions," Journal of Transportation Engineering.

Whinston, M. D. and S. C. Collins, 1992, "Entry and Competitive Structure in Deregulated Airline Markets: An Events Study Analysis of People Express," Rand Journal of Economics.

Windle, R.J. and M.E. Dresner, 1995b, "The Short and Long Run Effects of Entry on US Domestic Air Routes," Transportation Journal.

Williams, G., 1995, The Airline Industry and the Impact of Deregulation, Aldershot: Avebury Aviation.

Zhang, A., 1996, "An Analysis of Fortress Hubs in Airline Markets," Journal of Transport Economics