ARTICLE

THE FINANCIAL PERFORMANCE OF THE AIRLINE INDUSTRY POST-DEREGULATION*

Paul Stephen Dempsey♣

TABLE OF CONTENTS

♣ Tomlinson Professor of Law and Director, Institute of Air & Space Law, McGill University. From 1979 to 2002, Dr. Dempsey was Professor of Law and Director of the Transportation Law Program, University of Denver College of Law. A.B.J. (1972), J.D. (1975), University of Georgia; LL.M. (1978), George Washington University; D.C.L. (1986), McGill University. Admitted to the practice of law in Colorado, Georgia, and the District of Columbia. In the interest of full disclosure, the Author is also Vice Chairman of Frontier Airline Holding, Inc. and Chairman of Lynx Aviation, Inc. He wore his academic hat, rather than his corporate hat, in writing this article. This article was written prior to the unexpected Chapter 11 bankruptcy filing of Frontier Airlines Holdings, Inc., in April 2008.

Portions of this Article are taken from the Author's treatise, PAUL STEPHEN DEMPSEY & LAURENCE E. GESELL, AIRLINE MANAGEMENT: STRATEGIES FOR THE 21ST CENTURY (2d ed. 2006). Part II.A–C is reprinted from Chapters 3 and 4, Part II.D–E is reprinted from Chapter 4, and Part III is reprinted from Chapter 2. The original text has been updated and minor edits have been made to preserve consistency and to conform with Bluebook citation and *Houston Law Review* conventions.

I. INTRODUCTION

U.S. airlines were deregulated in 1978.[1] Although economic regulation was criticized for having produced poor financial results for the airline industry, the industry's financial performance has grown profoundly worse since deregulation. Deregulation is credited with having saved consumers billions of dollars; however, it generally has not taken blame for the massive financial losses the industry has suffered. Airline profitability has been decidedly worse since deregulation than before it. *Washington Post* economics editor Hobart Rowen described airline deregulation as a "bankrupt policy,"[2] an appropriate description considering the astonishing rate of airline bankruptcies since deregulation. Even the consumer may not be benefiting as much as deregulation advocates allege. Paradoxically, consumer prices for U.S. air travel have fallen at a significantly lower rate in the post-deregulation period than the regulatory period.

1. Airline Deregulation Act of 1978, Pub L. No. 95-504, 92 Stat. 1705 (1978).

2. Hobart Rowen, *Airline Deregulation: A Bankrupt Policy*, WASH. POST, Sept. 29, 1983, at A21.

The airline industry produces a healthy quantity of data, much by regulatory fiat.[3] Data used to evaluate the financial performance of the airline industry are examined in *Airline Management: Strategies for the 21st Century*,[4] which I co-authored with Laurence Gesell. Portions of *Airline Management* are updated and reprinted in this Article to support my thesis: the airline industry is in far worse financial condition after deregulation than before it. This Article demonstrates that even taking macroeconomic trends (e.g., recessions) and global events (e.g., terrorism and war) into account, the airline industry has suffered far more after—and partially as a result of—deregulation than under pre-1978 government regulation.

This Article is divided into four Parts. The instant introduction constitutes Part I. Part II describes the airline industry's financial performance with numbers, tables, and charts, which reveal how the industry has performed historically—pre-deregulation and post-deregulation. An historical explanation of what occurred in the airline industry is offered, and the impact on financial performance is discussed. Part III examines the somewhat unique economic attributes of the airline industry that influence its financial performance and evaluates the principal economic theories upon which deregulation was predicated, explaining how these theories were fundamentally flawed. This Article concludes by offering a theoretical view of the industry that better explains why its financial performance has been so dismal since deregulation.

II. FINANCIAL PERFORMANCE OF THE AIRLINES, PRE- AND POST-DEREGULATION

A. Profit (Loss)

Profit, of course, is the margin between revenue and cost. In the airline industry, it is a thin margin indeed, with net profits often hovering within only a relatively few percentage points (or fractions thereof) on either side of zero.

* * *

3. *See, e.g.*, U.S. Dep't of Transp., Bureau of Transp. Statistics, http://www.transtats.bts.gov (displaying a large amount of the data produced by airlines) (last visited Apr. 10, 2008).

4. PAUL STEPHEN DEMPSEY & LAURENCE E. GESELL, AIRLINE MANAGEMENT: STRATEGIES FOR THE 21ST CENTURY (2d ed. 2006). Data related to the financial performance of the airline industry both pre- and post-deregulation is summarized in Tables and Figures throughout the text of this Article. The data is updated from that originally printed in *Airline Management*.

Despite the fact the industry has become very highly concentrated under deregulation, the first decade of deregulation produced an extremely modest net profit for U.S. carriers of $800 million on revenue of more than $400 billion. In the ensuing five years, net losses totaled $14 billion.[5] By the mid-1990s, the U.S. airlines alone carried a debt burden of $35 billion, more than eight times the industry's total accumulated profit from the beginning of commercial aviation in the 1920s.[6]

During the first decade of deregulation, the U.S. airline industry's profit margin declined 74%, from already unsatisfactory levels, to a paltry 0.6% (compared with between 3.0% and 6.0% for all manufacturers). Table 1, "Net Profits of U.S. Scheduled Passenger Airlines," reveals profit margins pre- and post-deregulation.

Table 1: Net Profits of U.S. Scheduled Passenger Airlines

Year	Return on Investment (%)	Net Profit ($ Million)	Net Profit Margin (%)
1955	11.8	76	5.6
1956	9.4	80	4.6
1957	4.9	44	1.9
1958	6.3	50	3.0
1959	7.3	73	3.4
1960	2.8	9	0
1961	1.5	(38)	(1.7)
1962	4.1	52	0.4
1963	4.3	78	0.5

5. Julius Maldutis, Industry Investment Requirements—Looking Beyond 2000, Address Before the 7th IATA High-Level Aviation Symposium in Cairo, Egypt (Sept. 6–7, 1993).

6. *See* Lisa Burgess, *International Community Wants Action on Panel Report*, COMMERCIAL AVIATION NEWS, Aug. 23, 1993, at 21. Actually, the amount of accumulated profit is overstated because it has not been adjusted for inflation. Despite the popular perception, in real dollars, the airline industry has not lost all the profit it ever made since the inception of commercial aviation.

1964	10.0	223	4.8
1965	11.2	367	6.8
1966	9.7	427	6.5
1967	6.9	415	5.5
1968	4.9	210	2.5
1969	4.3	53	1.8
1970	1.4	(200)	(1.6)
1971	3.3	28	0
1972	5.1	215	2.5
1973	4.7	227	1.8
1974	7.8	322	2.1
1975	2.5	(84)	(1.8)
1976	8.5	563	2.0
1977	10.2	752	2.7
1978	13.3	1,197	3.6
1979	6.5	347	1.3
1980	5.3	17	0.1
1981	4.7	(301)	(0.8)
1982	2.1	(916)	(2.5)
1983	6.0	(188)	(0.5)
1984	9.9	825	1.9
1985	9.6	863	1.8
1986	4.9	(235)	(0.5)
1987	7.2	593	1.0

1988	10.8	1,686	2.6
1989	6.3	128	0.2
1990	(6.0)	(3,921)	(5.1)
1991	(0.5)	(1,940)	(2.6)
1992	(9.3)	(4,791)	(6.1)
1993	(0.4)	(2,136)	(2.5)
1994	5.2	(344)	0.4
1995	11.9	2,314	2.4
1996	11.5	2,804	2.8
1997	14.7	5,168	4.7
1998	12.0	4,903	4.3
1999	11.1	5,360	4.5
2000	6.4	2,486	1.9
2001	(6.5)	(8,275)	(7.2)
2002	(9.6)	(11,312)	(10.6)
2003	(0.3)	(3,628)	(3.1)
2004	N/A	(9,071)	(6.9)
2005	N/A	(5,782)	(3.8)
2006	N/A	3,045	(1.8)

* * *

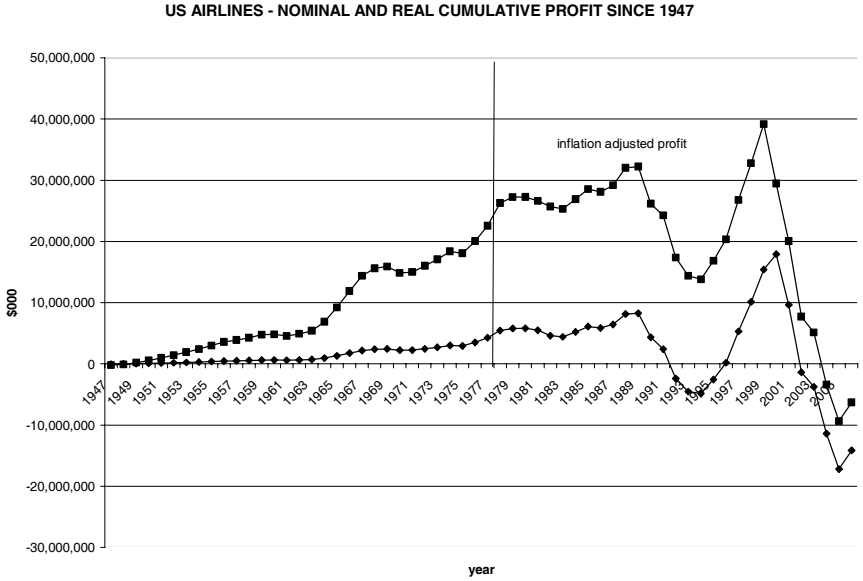
One would anticipate that such dismal economic performance would force the airline industry to load up with debt, which it has done, thereby compounding the problem. Table 2, "Net Profit (Loss) of Selected U.S. Major Airlines," reveals the economic performance of the nation's major carriers during the worst economic period in their history.

Table 2: Net Profit (Loss) of Selected U.S. Major Airlines

Airline	1990	1995	2000	2005
America West	(74.7)	53.8	2.1	(90)
American	(76.8)	162	813	(892)
Continental	(1,236.4)	224	342	(66)
Delta	(150)	422	828	(2,914)
Eastern	(1,115.9)	--	--	--
Northwest	(10.4)	694	256	(1,229)
Pan Am	(118.3)	--	--	--
Southwest	47.1	182.6	603	548
TransWorld	(237.6)	(227.5)	(266.7)	--
United	95.8	669	50	(435)
USAirways	(410.7)	34.3	(260)	(873)

By the end of 1991, the U.S. airline industry had lost all the profit it had earned since data began being collected, plus nearly $2 billion more. It would recover in the late 1990s, then lose all its profit again, whether measured in nominal or real (inflation-adjusted) dollars, again early in the 21st century. Few industries hold such a distinction. The net cumulative earnings of the U.S. airline industry are reflected in both nominal and real dollars in Figure 1, "Airline Industry Cumulative Net Profit." Anemic economic performance has forced more than 170 airlines into bankruptcy since deregulation began in 1978. Some entered Chapter 11 reorganization bankruptcy, continuing operations while seeking to restructure debt. Most were liquidated.

Figure 1.



At year end 2005, the only major carriers not in bankruptcy were American, Continental, and Southwest, and of the three, only Southwest was "standing alone in its 33rd consecutive year of profitability." But even Southwest was no longer operationally profitable. Because it had hedged fuel astutely, it was paying below-market prices for kerosene, keeping its bottom line in the black. All three airlines said prospects for future profitability depended heavily on avoiding excess capacity.[7] In an attempt to decrease industry-wide capacity (and, of course, competition), executives at United, American, and Delta urged the Department of Transportation (DOT) to revoke the certificates of airlines in bankruptcy on grounds that they failed to satisfy the fitness obligations of the Federal Aviation Act.[8] Ironically, United and Delta later found themselves in bankruptcy as well. Yet Steven Morrison and Clifford Winston allege that the bankrupt carriers have not constituted a source of significant revenue erosion for the major airlines. Never reticent to attach extravagant dollar numbers to their findings, they insist that the airline industry actually gained $1.6 billion from these bankruptcies by tarnishing the images of the Chapter 11 carriers and allowing

7. David Bond, *Yields Up, Losses Down*, AVIATION WK. & SPACE TECH., Jan. 23, 2006, at 37.

8. *Delta Executive Echoes Crandall Remarks on Bankrupt Airlines*, AVIATION DAILY, Feb. 19, 1992, at 296.

their competitors to raise fares.[9] Morrison and Winston's claims of consumer benefits, allegedly resulting from airline deregulation, have been consistently extraordinary.

* * *

Some blamed the financial collapse in the late 1980s and early 1990s on the Persian Gulf crisis, the spike in fuel costs it produced, an excessive amount of new aircraft capacity, and recession.[10] The Persian Gulf crisis and recession exacerbated, but did not create, inadequate profitability. Fuel actually cost the airline industry more per gallon in the early 1980s (reaching $1.06 a gallon in 1981—or, adjusted for inflation, between $1.40 and $1.47 a gallon) than in the late 1980s (reaching a high point of $0.80 a gallon in 1990).[11]

In the early 1970s, the airlines confronted a more profound spike in fuel costs (with the Arab Oil Embargo of 1973 causing aviation fuel costs to rise 89% in 1974, as compared with a 29% increase in 1990) and a severe recession, as well as an influx of new capacity (with the advent of the 747s, DC-10s, and L-1011s). Recession hit the nation hard in the 1970s as well. But a comparison of industry profitability in the late 1980s and early 1990s with these nearly identical events in the 1970s, under regulation, reveals a sharp contrast.

* * *

Historically, on an industry-wide basis, manufacturers rather consistently have earned a net profit margin between 4% and 6%. As shown in Figure 2, "U.S. Airline Industry Net Profit Margin," the U.S. airline industry's net profit margin averaged a modest 2.8% from 1955–1977, then collapsed to 0.5% from 1978–1987, deregulation's first decade. Add in 1988–1995, and the average after deregulation drops to –0.3% (the airline industry's net profit margin averaged 1.6% in its ten profitable post-deregulation years, and –2.6% in its eight unprofitable post-deregulation years).

The fact that the U.S. airline industry has lost all its accumulated profit—on either a nominal or inflation-adjusted

---

9. STEVEN A. MORRISON & CLIFFORD WINSTON, THE EVOLUTION OF THE AIRLINE INDUSTRY 108 (1995).

10. *See, e.g.*, JAMES OTT & RAYMOND E. NEIDL, AIRLINE ODYSSEY (1995); TRANSP. RESEARCH BD., WINDS OF CHANGE: DOMESTIC AIR TRANSPORT SINCE DEREGULATION (1991).

11. SAMUEL BUTTRICK, AIRLINE INDUSTRY DATABASE (1992); Perry Flint, *Don't Blame It All on Fuel*, AIR TRANSPORT WORLD, Feb. 1991, at 32.

basis[12]—sets it apart from healthy industries and is meaningful indeed. Undoubtedly, anachronistic industries become obsolete at the end of their life cycles and consume all their accumulated profit. Perhaps the buggy whip manufacturing industry or the ice home delivery industry consumed all the profit they historically accumulated as automobiles and refrigerators, respectively, became ubiquitous in America's garages and kitchens. But, there is no contemporary technological replacement for public long-distance or intercontinental transportation provided by commercial aviation. Commercial aviation is intercity mass transit for the people and an essential part of the infrastructure of global trade.

There are various comments one could make about the fact that nearly half the industry collapsed into bankruptcy early in the 21st century. Some blame bad management, greedy labor, high fuel costs, low demand, and excess capacity. All are contributing factors. But there is another. Here is how several prominent experts interpret the financial collapse: "There is no denying that the profit record of the industry since 1978 has been dismal, that deregulation bears substantial responsibility, and that the proponents of deregulation did not anticipate such financial distress—either so intense or so long-continued."

The above quote, by the way, was made in 1988—before the second trough of the early 1990s and the current trough, which were both far deeper than those that preceded it. Its author did not blame deregulation as the sole cause, for it clearly was not. "Deregulation," wrote the expert, "bears substantial responsibility." It was, however, a "but for" cause. It could be said with some confidence that "but for" deregulation, its principal proponent—United Airlines—would not have spent more years in bankruptcy than any other airline in history. Fuel spikes, aerial terrorism, labor demands, recession, and excess capacity all preceded deregulation, but bankruptcy by and large did not. Now, a little bankruptcy is good for an industry, and regulation was imperfect. However, half the capacity of an industry in bankruptcy is beyond the pale: it is a manifest catastrophe. The quoted material above was written by a clever economist named Alfred Kahn. As Jimmy Carter's Chairman of the Civil Aeronautics Board when the Airline Deregulation Act of 1978 was promulgated, Kahn was deregulation's principal architect.

Here's another explanation as to why the airline industry is financially disintegrating: "Individual airlines, following their

12. *See infra* fig.2.

own interests in a completely rational way, act in a way which is collectively irrational."

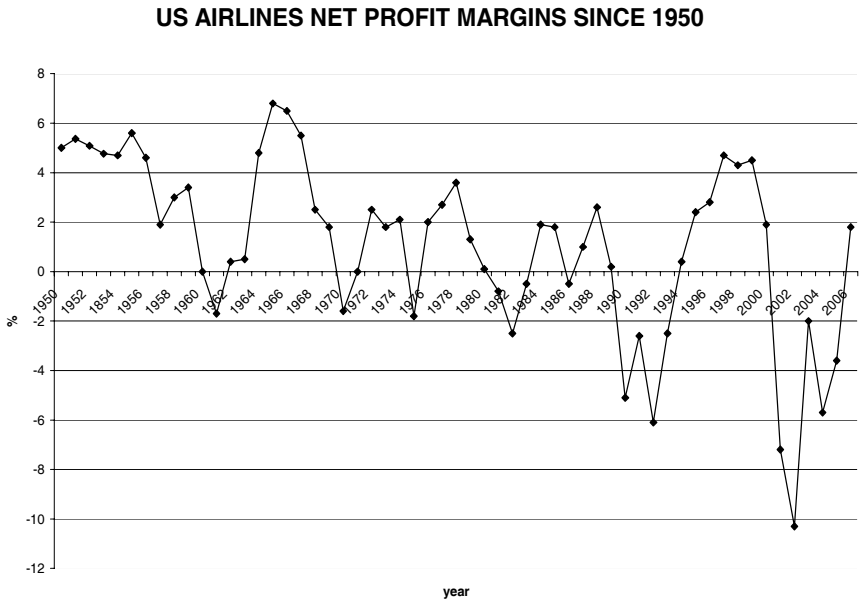
Individually rational action becomes collectively irrational in this industry characterized by high fixed costs, excess capacity, perishable inventory, and the vicissitudes of demand sometimes suppressed by phobias about safety, terrorism, communicable disease, and economic recession. The author of the above quote was Bob Crandall, then CEO of American Airlines, who also pointed out that prices tended to be set by the dumbest competitor.

Now, let's visit another comment from Fred Kahn on the same subject: "Destructive competition . . . has been one of the unpleasant surprises of deregulation."

It is an unpleasant surprise that deregulation bears substantial responsibility for the destructive competition that contributed to a bankruptcy filing for carriers representing half the U.S. fleet capacity. In this environment, even Southwest would be losing money had it not hedged fuel.

If one examines Figure 2 below, "U.S. Airline Industry Net Profit Margin," one will see that the performance of the industry has worsened significantly and progressively during each downward cycle, at about ten year intervals, since deregulation.

Figure 2.



Since demand is cyclical, dependent on rises and falls in disposable income and consumer confidence, to some extent airline performance correlates with the rise and fall of the economy.

* * *

B. Contemporary Crisis Compared with Past Economic Downturns

From 2001 through 2006, the U.S. airline industry suffered net losses of $35 billion, exclusive of the $5 billion bailout provided by the U.S. Treasury to compensate the airlines for the impact of the 9/11 tragedies. The problems faced by the U.S. airline industry today are different in magnitude from those it suffered in earlier periods since deregulation. But they are not new. Let us provide some historical perspective, in reverse chronological order: during the recession of 1990–1994, the industry lost $13 billion, the worst losses in history up until that time.[13] Terrorism had earlier depressed demand with the explosion of Pan Am 103 over Lockerbie, Scotland. President George Bush (the Elder) had led the country in its first war against Saddam Hussein, and fuel prices had spiked. The U.S. industry lost all the profit it had earned since the dawn of commercial aviation. During this period, five major airlines (Pan Am, Eastern, TWA, Continental, and America West) fell into bankruptcy, and two of them (Pan Am and Eastern) were liquidated, while a third (TWA) stumbled on without profits for nearly a decade until it was acquired by American Airlines.

During the recession and fuel spike of 1981–1983, the U.S. airline industry lost $1.4 billion. Two major airlines (Braniff and Continental) fell into bankruptcy, and one (Braniff) was liquidated.

Before deregulation in 1978, there were no major airline bankruptcies or liquidations. None! When a carrier was suffering financially, the Civil Aeronautics Board injected it with lucrative

---

13. The laissez-faire period which followed the 1981–1983 recession led to a roller coaster of industry consolidations in the 1980s, creating modest profitability for a short while. Then recession, the Gulf War, and a spike in fuel caused economic collapse from 1990–1994, during which time the U.S. industry lost 13 billion U.S. dollars. The President and Congress responded by creating the National Commission to Ensure a Strong Competitive Airline Industry, most of whose members had little enthusiasm for any governmental remedy beyond such indirect subsidies as releasing crude from the Strategic Petroleum Reserve and rolling back taxes. Direct subsidies were provided to one Minneapolis-based airline. Five major carriers collapsed into bankruptcy; two were liquidated.

routes, or encouraged a healthier airline to acquire it (as Delta acquired Northeast and United acquired Capitol, for example), much the same way the banking regulators handle the problem.[14]

But there were several crises in the industry that caused it enormous financial pain. In the early 1970s, the industry reeled from the onslaught of massive capacity increases inspired by overly optimistic traffic projections, which coincided with dampened demand produced by recession and a tripling of fuel prices triggered by the Yom Kippur War and the resultant oil embargo. The regulators responded by approving cost-based tariffs, authorizing capacity limitation and route-swapping agreements, and imposing a moratorium on new route certification. The result was reduced profitability and a one year (1970) loss of only $200 million—again, the worst loss in history up until that time, though it pales in significance compared with the $1.4 billion losses of the early 1980s, the $13 billion losses of the early 1990s, or the $35 billion losses of the early 2000s. But in the 1970s, consumerists viewed the use of these financially bolstering regulatory tools as anticompetitive; they sowed the seeds for regulatory reform, the momentum for which quickly transformed into wholesale deregulation.[15]

Going back a bit further in time, in 1938 the airline industry successfully lobbied Congress for regulation to protect it from the vicissitudes of the market cycle. Before regulation, the U.S. airline industry had lost half of the capital that had been invested in it. The unregulated airline industry (before 1938 and after 1978) appears to have the characteristics of destructive competition whenever the economy softens.[16] As George

---

14. Competition oversight and financial stabilization was performed during the Air Mail contract period, and during the period of economic regulation (1938–1978). Economic growth and technological developments, coupled with benign governmental oversight, kept the industry profitable and, importantly, lowered consumer prices significantly until the recession of 1969–1971.

15. Potential economic collapse caused by excessive capacity, recession, and a sharp spike in fuel prices triggered by the Yom Kippur War and the resultant oil embargo was avoided in the early 1970s by the application of regulatory tools—a route moratorium, capacity limitation agreements, pass-through of fuel in the rates, and route swapping. All that was viewed as anticompetitive and anticonsumer, leading Congress to deregulate the industry in 1978.

16. The existence of destructive competition has long been accepted as a rationale for economic regulation of an industry. Only a few years before becoming Chairman of the Civil Aeronautics Board, Alfred Kahn wrote:

> The major prerequisites [of destructive competition] are fixed or sunk costs that bulk large as a percentage of total cost; and long-sustained and recurrent periods of excess capacity. These two circumstances describe a condition in which marginal costs may for long periods of time be far below average costs. If in these circumstances the structure of the industry is unconcentrated—that is, its

Santayana said, "Those who cannot remember the past are condemned to repeat it."[17] Or, said another way, "He whose investment banker neglects to follow the lessons of history, may be forever condemned to part with his money."[18]

If one pulls newspaper clippings describing the condition of the North American airline industry from the early 1980s, the early 1990s, and the early 2000s, the headlines are remarkably similar to those published before 1938.[19] They speak of the economic disintegration of that airline industry, massive financial hemorrhaging, tens of thousands of employee layoffs, hundreds of grounded aircraft, numerous bankruptcies, and major liquidations. Thus, airline economic performance in most

---

> sellers are too small in relation to the total size of the market to perceive and to act on the basis of their joint interest in avoiding competition that drives price down to marginal cost—the possibility arises that the industry as a whole, or at least the majority of its firms, may find themselves operating at a loss for extended periods of time.

ALFRED E. KAHN, ECONOMICS OF REGULATION (2d ed. 1988). Kahn described the post-deregulation U.S. airline industry almost perfectly. Fixed costs outweigh variable costs by a margin of about four to one. The airline industry suffers from relentless excess capacity. On a national basis the industry is unconcentrated, leading to tremendous network competition for connecting traffic, often driving prices down to variable costs. Under deregulation, the airline industry has operated at a loss for extended periods of time.

Before Congress in 1977, Kahn testified, "The assumption that you are going to get really intense, severe, cut throat competition just seems to be unrealistic when you are talking about a relatively small number of carriers who meet one another in one market after another." Kahn said, "I just do not see any reason to believe that an industry which is potentially rapidly growing, for which there is an ever-growing market, cannot prosper and attract capital." Speaking before the New York Security Analysts in 1978, he discounted destructive competition: "The most general fear about [airline deregulation] is that when the CAB withdraws its protective hand from the doorknob, the door will open to destructive competition—to wasteful entry and cut-throat pricing—that will depress profits, render the industry unable to raise capital, and so cause a deterioration in the service it provides—on the whole, it must be admitted, good service." Alfred E. Kahn, Chairman, Civil Aeronautics Bd., Address at the New York Society of Security Analysts, *in* AVIATION WK. & SPACE TECH., Mar. 20, 1978, at 39.

That was before deregulation. A decade after deregulation, Kahn confessed "There is no denying that the profit record since 1978 has been dismal, that deregulation bears substantial responsibility, and that the proponents of deregulation did not anticipate such financial distress—either so intense or so long-continued." That was said before the $13 billion of U.S. airline industry losses of 1990–1994, or the $21 billion of losses in 2001–2002. Kahn also appears to have changed his mind on the issue of whether the airline industry is subject to bouts of destructive competition. When asked about whether his vision of deregulation in the late 1970s included the steep financial nose dive that resulted from it, Kahn replied, "No. I talked about the possibility that there might be really destructive competition, but I tended to dismiss it. And that certainly has been one of the unpleasant surprises of deregulation."

17. GEORGE SANTAYANA, THE LIFE OF REASON OR THE PHASES OF HUMAN PROGRESS 284 (Charles Scribner's Sons 1924).

18. Dave Bates, *Debunking the Myth*, FLIGHT LINE, Apr. 1996, at 7.

19. *See* PAUL STEPHEN DEMPSEY, THE SOCIAL AND ECONOMIC CONSEQUENCES OF DEREGULATION 39–42 (1989).

of these cycles has grown progressively worse, with generally declining highs (7.4% in 1965–1966; 5.4% in 1978; 2.7% in 1988; and, though with tax relief, it improved to 2.8% in 1996, and exceeded 4% for the three years thereafter), and progressively deeper lows (–1.2% in 1961; –2.2% in 1970; –2.5% in 1982; –5.6% in 1990; and –10.4% in 2002).[20]

Most of these profitability cycles correlate somewhat with the rise and fall in gross domestic product (GDP) and fuel costs, as well as fluctuations in fleet capacity. But the airline industry is hypercyclical. In good years, it has done nearly as well as other industries; in bad years, it has performed far worse. Individual airlines exhibit operational leverage—wide swings in performance based on relatively small changes in demand or costs. For example, in the 1980s, a one cent increase in fuel cut TWA's earnings by $14 million, while a single additional passenger booked on each of TWA's aircraft increased revenue by $12 million.[21]

The average net profit margin for U.S. airlines has fallen nearly every decade. From 1955–1960, its net profit margin was 3.1%; from 1961–1970, the net profit margin was 2.7%. It fell to 2% from 1971–1980, then to –0.3% from 1981 to 1990, but then rose to 10.3% from 1991–2000, before it collapsed again in the 21st century.[22] From 2000 to 2005, it was a dismal –5.2%. Much traffic growth and corresponding revenue improvement is stimulated by declining yields. But the decline in real yields has slowed during the post-deregulation era, in part because of the relative dearth of major aircraft productivity improvements since 1978, in part because the grim U.S. air carrier financial condition has not allowed the airline industry to replace fully its aging fleet with the newest generation of fuel efficient aircraft, and in part because hubbing has led airlines to fly relatively smaller aircraft shorter stage lengths (vis-à-vis the pre-deregulation trend of larger aircraft flying longer distances), thus depriving the industry of the economies of scale inherent in larger aircraft flying longer distances. Thomas Gallagher summed up the secular historical trends influencing the airline industry:

> Taken together, all these historical data argue that the macro drivers of air traffic growth, consisting of economic activity or income growth, its traffic multiplier, the real cost of air travel, and its multiplier, are becoming increasingly less favorable each cycle. During the last four, real yields

20. AIR TRANSPORT ASS'N OF AM., THE AIRLINE HANDBOOK (2007).

21. MARK STEVENS, KING ICAHN 203–04 (1993).

22. ESG Aviation Servs., 8 THE AIRLINE MONITOR F6 (June 1995).

> have steadily declined, spurring higher and higher levels of traffic. But over the same period, the rate of decline in real yields has, in itself, *decreased*. Here is the equally familiar notion of diminishing marginal returns: the yield phenomena resulting from improvements in efficiency, largely due to the introduction of modern jet aircraft, have shown a diminishing rate of influence.[23]

Homi Mullan, managing director of London's Chase Investment Bank, studied the cyclical trends of air traffic and airline operating margins, finding the two correlated closely with each other and with spikes in fuel costs and recession. But he objects to the complacency that the "cyclical industry" theory has created, noting that "although we still have good years followed by bad, the good years are not as good as they used to be and the bad years are a lot worse than they used to be. Put another way, the industry's performance is steadily getting worse."[24]

Despite the conventional wisdom to the contrary, deregulation has *not* resulted in increased industry productivity.[25] In fact, hubbing, the primary means of rationalizing the market after deregulation, appears to have reduced efficiency and productivity as measured by labor and equipment utilization and fuel consumption. Hubbing also increased airport congestion, increased travel circuitry, and has been a catalyst for the purchase of smaller aircraft, ending the pre-deregulation trend toward larger and larger aircraft (with their corresponding lower costs per available seat mile (CASM)).[26] It was not until 25 years after deregulation that major U.S. carriers like Delta and American began to de-hub their operations, scheduling on the basis of operating efficiency rather than flight connectivity. Despite squeezing seat pitch tighter and (for many airlines) reducing the number of flight attendants to FAA minimums, "in the ten years after 1983, despite deregulation and intensified competition, neither cabin crew nor

---

23. Thomas J. Gallagher, *Aircraft Finance and Aircraft Financial Analysis in the Fifth Cycle of the Jet Age*, *in* THE HANDBOOK OF AIRLINE ECONOMICS 223, 228 (Darryl Jenkins ed., 1995).

24. Homi P.R. Mullan, *Financing the Future*, *in* INT'L AIR TRANSPORT ASS'N, A VISION OF THE FUTURE 69 (1995).

25. "Any business that produces an ever smaller amount of physical product for each dollar of cost had better be able to raise its prices at will. Needless to say, this is not an option generally available to the airlines." ESG Aviation Servs., 7 THE AIRLINE MONITOR 5 (Sept. 1994).

26. *See* PAUL STEPHEN DEMPSEY & ANDREW GOETZ, AIRLINE DEREGULATION & LAISSEZ FAIRE MYTHOLOGY 317–18 (1992).

flight crew productivity appear to have improved in North America!"[27]

C. Causes of Unsatisfactory Financial Performance

What has caused the contemporary crisis—the worst financial result since deregulation? The fundamental problem is excess capacity relative to demand and excess cost relative to price. Too often, there are an insufficient number of passengers willing to pay a price sufficient to cover the industry's costs.

1. The Cost–Price Disconnect. Costs have risen significantly. The events of September 11th not only dampened travel demand, but increased security and insurance costs. By some estimates, increased security alone imposed $2.5 billion of additional costs on the industry.

Then, there were the labor agreements signed during the "bubble" years of the 1990s. In baseball, the Texas Rangers signed a contract with free agent shortstop Alex Rodriguez for a salary of $25.2 million a year. In commercial aviation, United Airlines signed a contract with its pilots union paying senior pilots $300,000 a year. Both created a new paradigm of unrealistic and unsustainable expectations by other employee groups seeking parity with their better paid union comrades.

The threat or inauguration of war in the Middle East always causes fuel costs to spiral upward. The confluence of these events led airline management to focus on liquidity and CASM,[28] and government assistance in the form of subsidies, insurance, and tax relief.

Costs have also been driven by the megatrends of deregulation. Since deregulation, all major U.S. airlines but one (Southwest) have adopted the hub-and-spoke method of distribution. On the revenue side of the equation, hubs:

- Produce a geometric growth in the number of city-pairs that can be marketed;
- Create monopoly and duopoly pricing opportunities for origin and destination (O&D)

27. Rigas Doganis, Fariba E. Alamdari & Andrew Lobbenberg, *Who is Lean & Mean?*, AIRLINE BUS., Nov. 1994, at 22, 31.

28. Cost per available seat mile (CASM) is the essential unit of production in passenger air transportation. The down-gauging of aircraft (substitution of relatively smaller for larger aircraft) increases CASM, but usually reduces block-hour operational costs and results in higher load factors. Higher CASM, however, requires higher revenue per available seat mile (RASM) to break even.

traffic to and from the hub, as well as certain connecting markets fed only by it; and

- Allow carriers to take advantage of the S-Curve relationship between revenue, along one axis, and frequency, along the other.

However, hubbing creates variable cost-based pricing for long-distance city-pairs. But in an industry dominated by fixed costs, a variable cost focus can impair the ability of carriers to cover fully allocated costs.[29] Moreover, in a recessionary economy in which large numbers of traditionally high-yield passengers decline to fly (and thereby cross-subsidize the fully allocated costs of leisure travel), and many more prefer the convenience of nonstop service whenever available at reasonable cost (for example, by low cost carriers),[30] the cost burden of frequency and hub connectivity can outweigh its revenue generation.

---

29. Variable cost pricing will enable airlines to cover fully allocated costs only if there are a sufficient number of passengers willing to pay higher fares so as to make a disproportionate contribution to fixed costs. In other words, the pricing regime must be highly discriminatory (sometimes called "Ramsey Pricing"), and yield management is all about trying to squeeze the maximum revenue from each seat based upon the demand characteristics of the passenger. Typically, business passengers (who purchase their tickets on short notice and do not stay over Saturday night) pay more than leisure passengers on the same flight.

30. Hubs are highly inconvenient for the majority of passengers who flow through them. Certainly, origin and destination (O&D) passengers who begin or end their trips at hubs enjoy frequent and convenient nonstop service on every spoke radiating from a hub, though they pay a premium (some would say, a monopoly) charge for that privilege. But most passengers at hub airports are on their way to some other place. The opportunity to fly circuitously to their intended destination, spend an hour or more on the ground, then continue on, is hardly a paradigm of convenience, particularly in an industry that counts among its greatest inherent attributes its inherent ability to save time—humankind's most important commodity. Surely too, many passengers trade off the inconvenience of a hub connection for a lower price, though that too makes the point that hubs are inconvenient, but competitively priced for some (but not all) who must connect there. If frequency is synonymous with convenience, it must be because a frequent schedule saves consumers time; but if time is lost due to the connection, the savings are mutilated. The privilege of departing earlier is lost if one is forced to arrive later. Certainly too, some city-pairs are too thin to warrant nonstop service; connecting is, for example, the only way to get from Boise, Idaho to Savannah, Georgia. So, hub connections are convenient in some long-haul thin markets that cannot support a nonstop aircraft (though the regional jets (RJs) are beginning to serve many of those markets). Nevertheless, for passengers traveling in city-pair markets that can support nonstop service (such as Birmingham, Alabama to Los Angeles, California pre-deregulation), nonstop service is far more convenient than a hub connection. Price may indeed be a different issue, but much airline pricing has been based largely on competitive considerations, rather than cost, and as a general rule, connectivity costs more to produce than does nonstop service.

Hubbing also drives costs up.[31] It erodes efficiency by lowering equipment utilization and labor utilization, and increasing fuel consumption. Because of market fragmentation, hubbing deprives the industry of its ability to use higher capacity/lower CASM aircraft.[32] Since deregulation, the only major airline to have been consistently profitable (Southwest) operates a linear route system.

The failure of costs to fall at the pre-deregulation pace may explain the fact that post-deregulation real (inflation adjusted) yields have fallen at a slower pace than pre-deregulation real yields.[33]

2. The Demand–Capacity Disconnect. The excess capacity that plagues the North American industry is a product of the desire of U.S. airlines to offer the frequency levels that attract high-yield business traffic. It is a "tragedy of the commons" phenomenon.[34] The S-Curve relationship between frequency and revenue causes carriers to offer high frequency on all their important routes in order to capture the business traveler. The fifteen interior U.S. hubs create wasteful network duplication, driving competitive pricing down to variable costs in order to

---

31. Hubbing slows down an airline's operations. It requires landing a large number of aircraft, shuffling a large number of bags and passengers, and then taking off a large number of aircraft, all of which creates congestion and delay, thereby reducing efficiency and productivity in aircraft utilization and labor utilization, while increasing fuel burn. It is telling that the only major airline to have consistently been profitable year after year is Southwest Airlines, which operates a linear route system.

32. The fleet decisions inspired by the dominant post-deregulation hub-and-spoke paradigm account for the industry-wide plateau and decline in average aircraft size since 1978. *See* MELVIN A. BRENNER, JAMES O. LEET & ELIHU SCHOTT, AIRLINE DEREGULATION (1985). Brenner, Leet, and Schott explain:

> There is . . . an economy of scale in aircraft size. But the market fragmentation of deregulation has made it more difficult to obtain the benefits of that scale. In this sense, deregulation has converted what would normally have been less efficient planes, into seemingly more efficient ones, simply because the smaller planes fit better into the new market subdivisions and uncertainties. . . . The trend toward smaller planes has been only illusory cost efficiency, and in fact has actually resulted in higher seat-mile cost than would be possible without it.

Id.

33. Declining costs in the pre-deregulation period correlate reasonably well with the productivity improvements of aircraft technology. It is inaccurate, however, to suggest that deregulation correlates well with the end of technological improvements, and that that explains why post-deregulation costs and yields have fallen at a slower rate. In fact, hubbing—the dominant megatrend on the deregulation landscape—has eroded airline efficiency and productivity in terms of aircraft and labor utilization and fuel burn. Inflation adjusted fares (or yields) fell faster in virtually every period pre-deregulation than in the same number of years post-deregulation. *See* DEMPSEY & GOETZ, *supra* note 26, at 244–46; *see also* DEMPSEY & GESELL, *supra* note 4, at 420.

34. *See* Garrett Hardin, *The Tragedy of the Commons*, SCIENCE, Dec. 13, 1968, at 1243, 1244.

derive some revenue from seats that otherwise would fly empty. Individually rational behavior becomes collectively irrational in a competitive, fungible-commodity industry characterized by excess capacity, highly perishable inventory, and high fixed costs. The network hub carriers are all selling connecting seats on a variable cost basis, trying to cover their fixed costs on their O&D traffic which, during a recession, will not come close to covering them. If all carriers had the costs of Southwest Airlines, they likely would still find a way to compete away all the profit. Southwest's advantage is based on a relative cost advantage, tied to fleet and employee utilization that the hub carriers could only achieve in their wildest of dreams.

The Internet's contribution, in terms of higher load factors and reduced distribution costs, is offset by its ability to drive prices down to collectively nonremunerative levels. The widespread eradication of travel agents as a distribution intermediary reduces costs but also significantly reduces the airlines' ability to obfuscate the lowest fares.

Excess capacity is also caused by the fact that average unit costs decline with growth and increase with constriction. This is true, not only because of the high ratio of fixed to variable costs in the industry, but also because the least expensive employee is the most recently hired, who, because of labor seniority rules, will be the first out the door if the company lays off employees. Hence, there is a strong incentive for growth and strong resistance to constriction.

The bankruptcy laws also play a role in producing excess capacity, by giving special protected status to aircraft lessors and stringing out the process of capacity reduction via liquidation. The aircraft themselves are relatively fungible, and the fuselage can be readily repainted in a surviving carrier's livery, thereby bringing grounded aircraft back to life.

Moreover, the airline industry has always, will always, and probably should always provide capacity in excess of demand. Demand for airline services is highly cyclical and fickle, depending on time of day, day of week, month of year, and broader macroeconomic trends of inflation and recession, as well as the psychological impact of catastrophic events (such as a crash into the Everglades or the World Trade Center). Excess capacity encourages all carriers to sell empty seats at a price that will cover variable costs and make some contribution to fixed overhead, and new internet distribution engines facilitate this ability. The problem is that widespread discount pricing consumes demand at an entry point lower than consumers may be willing to pay absent draconian sale behavior, sponging up

demand that might fly at a higher price later on. Since airline costs are disproportionately fixed, variable cost-based pricing is a prescription for bankruptcy if embraced too generously, for too long a time.

These problems are profoundly exacerbated during economic downturns and waning consumer confidence, as well as the threat or fear of war or a terrorist event. As the war in Iraq began, United Airlines' international bookings fell 40%.[35] Should a shoulder-fired missile or other terrorist event take down a commercial aircraft, the economic effect may be an additional loss in excess of $2 billion.[36]

* * *

3. Debt: On-Balance Sheet, and Off. Healthy corporations have an appropriate balance of debt and equity. The advantage of equity in its usual form—common stock—is that its dividends do not have to be declared during unprofitable periods. This source of capital acts as a cushion for the carrier during economic downturns and reduces risk for lenders. Preferred stock may also be issued. Without diluting the interests of common stockholders, it carries less risk than debt, but more risk than common stock.[37] Loading up the balance sheet with excessive debt results in a growth in interest obligations and, because the debt is placed at higher risk, an increase in the cost of capital for new debt.[38] In a highly cyclical industry like commercial aviation, significant fixed-interest payments may constitute an equally significant financial burden for the airline.[39]

Since deregulation, the balance sheets of U.S. airlines have been polluted with enormous debt, caused by grossly inadequate profitability and, at several airlines, leveraged buy-outs (LBOs) and profligate asset acquisition.[40] By the mid-1990s, total debt to capital ratios exceeded 65% at virtually all the major U.S. airlines, and would have been worse still if operating leases had been capitalized. Total debt at the major airlines was $62 billion

---

35. *The Darkest Hour*, ECONOMIST, Mar. 22, 2003, at 53. For U.S. airlines, domestic bookings fell 5%–10%, Latin American bookings fell 3%–19%, transpacific bookings fell 10%–20%, and transatlantic bookings fell 20%–30%. C. Daniel, *American Airlines Pilots Offer $660m Cuts*, FINANCIAL TIMES, Mar. 31, 2003, at 17.

36. *The Darkest Hour*, *supra* note 35, at 53.

37. NAWAL K. TANEJA, AIRLINE PLANNING: CORPORATE, FINANCIAL, AND MARKETING 51 (1982).

38. *See generally* STEPHEN SHAW, AIRLINE MARKETING & MANAGEMENT 138 (3d ed. 1990).

39. TANEJA, *supra* note 37, at 53.

40. DEMPSEY & GOETZ, *supra* note 26, at 11–40.

by the end of 1995.[41] As a consequence, Wall Street downgraded the debt of virtually every major airline to speculative or "junk" status (meaning Wall Street believes that firms so categorized have about a 28% default rate).[42] As Wall Street analyst Julius Maldutis aptly noted, if the airlines were savings and loan institutions, the government would put them into receivership and liquidate them.

Table 3, "Debt as a Percentage of Capitalization," reveals the total debt/total capitalization ratios for selected major airlines. As can be seen, the post-deregulation period exhibited a very sharp increase in debt-to-capital ratios. By the mid-1990s, the balance sheets of United, US Airways, Northwest, and TWA, although improving, were still poor. By the mid-1990s, debt was the source of 65% of airline capital spending, compared with 40% in all U.S. industry.[43] By 1995, the average debt-to-capital ratios, though significantly improved from their 1992 depths, still were significantly worse than their pre-deregulation levels, despite the removal of Eastern and Pan Am from the database. They declined still further in the early 21st century.

Table 3: Debt as a Percentage of Capitalization

Airline	**1978**	**1980**	**1990**	**1995**	**2000**	**2005**
America West	--	--	96.7	36.5	17.9	89
American	54.4	63.4	46.7	65.5	53.8	105
Continental	46.7	62.3	N/A	73.8	64.6	99
Delta	13.3	10.6	49.8	57.3	51.4	189
Eastern	N/A	78.5	(21.8)	--	--	--
Northwest	11.2	5.4	43.5	79.7	77.6	164
Pan Am	N/A	62.0	--	--	--	--
Southwest	59.1	38.0	35.1	31.7	18.1	24
TWA	64.2	61.8	140.6	73.7	909.7	--
United	49.3	45.2	42.5	104.8	54.3	186
USAirways	41.7	44.0	55.8	102.9	115.4	110
Average	**44.8**	**53.5**	**74.3**	**70.9**	**53.8**	**121**

41. *FAA Plans to Complete Fiscal 1997 User Fee Plan Within Two Weeks*, AVIATION DAILY, Apr. 17, 1996, at 102.

42. *The Financial Condition of the Airline Industry, Hearings Before the U.S. House Subcomm. on Aviation*, 104th Cong., 1st Sess. 48 (1995) (statement of Philip Baggaley, Managing Director, Standard and Poor's Debt Rating Group).

43. Paul Proctor, *ATA Predicts Record Year for U.S. Airline Profits*, AVIATION WK. & SPACE TECH., May 13, 1996, at 33.

Debt is on-balance sheet, and off. Off-balance sheet debt appears primarily in the form of aircraft operating leases.[44] The lease burden has grown enormously since deregulation. While major U.S. airlines leased an average of 19% of their fleets in 1969, some 25 years later, the average had jumped to 51%—more than a 250% increase. In contrast, British Airways leased only one third of its fleet.[45] In 1969, 87% of the leases were long term agreements. Healthy carriers leased few, if any aircraft (Delta and Northwest leased none). Financially distressed carriers, such as Eastern, TWA and Northeast, leased a large percentage of their fleets.

* * *

D. Bankruptcy

Professor Goodfriend and colleagues have observed, "The airline industry is well known to be subject to high levels of business and financial risk, even during 'good times.' Rare prior to deregulation in 1978, airline bankruptcies have become rather endemic."[46]

* * *

As revealed in the rather incomplete list in Table 4, "Airline Bankruptcies," since deregulation, more than 160 carriers have collapsed into bankruptcy.[47]

Table 4: Airline Bankruptcies

1. New York Airways	65. McClain Airlines	117. States West Airlines
2. Aeroamerica	66. Rio Airways	118. Hawaiin Airlines
3. Florida Airlines	67. Air Puerto Rico	119. Florida West
4. Indiana Airways	68. Gull Air	120. USAfrica Airways
5. Air Bahia	69. Royal West Airlines	121. MarkAir
6. Tejas Airlines	70. Air Atlanta	122. Trans World Airlines
7. Mountain West	71. Air South Inc.	
8. LANICA		

44. Frequent flyer liability is also a significant source of off-balance sheet liability for airlines, but because of capacity limitations, it usually consumes seats which otherwise would be flown empty.

45. Julius Maldutis, *British Airways Plc—The Crown Jewel*, Aug. 23, 1993, at 11.

46. Jason Goodfriend, Richard Gritta, Bahram Adrangi & Sergio Davalos, *Assessing the Financial Condition of the Major U.S. Passenger Airlines Over the 1993–2003 Period Using the P-Score and Z-Score Discriminant Methods*, 10 CREDIT & FIN. MGMT. REV. 41–42 (2004).

47. Uchitelle, *Off Course*, N.Y. TIMES MAG., Sept. 1, 1991, at 12.

9. Coral Air
10. Pacific Coast
11. Swift Aire Line
12. Golden Gate
13. Pinehurst Airlines
14. Silver State
15. Air Pennsylvania
16. Cochise Airlines
17. Braniff Int'l
18. Astec Air East
19. Will's Air
20. Aero Sun Int'l
21. Aero Virgin Islands
22. Altair
23. North American
24. Island Empire
25. State Airlines
26. Golden West
27. Continental Airlines
28. National Florida
29. Air Vermont
30. Pacific Express
31. Dolphin
32. Combs Airways
33. New York Helicopter
34. Air Florida
35. Excellair
36. American Int'l
37. Emerald
38. Hammonds Commuter
39. Air North
40. Wright Air Lines
41. Oceanaire Lines
42. Atlantic Gulf
43. Connectaire
44. Air One
45. Capitol Air
46. Wien Air Alaska
72. Royale Airlines
73. Sun Coast Airlines
74. Air New Orleans
75. Air Virginia
76. Mid Pacific Airlines
77. Exec Express
78. Caribbean Express
79. Pocono Airlines, Inc.
80. Virginia Island Seaplane
81. Princeton Air Link
82. Qwest Air
83. Southern Jersey Airways
84. Eastern Air Lines
85. Big Sky Airlines
86. Air Kentucky
87. Braniff, Inc.
88. Presidential
89. Resort Commuter
90. Pocono Airlines
91. SMB Stage Lines
92. CC Air
93. Britt Airways
94. Rocky Mountain Airways
95. Continental Airlines
96. Pan Am World Airways
97. Pan Am Express
98. L'Express
99. Eastern Air Lines
100. Bar Harbor Airlines
101. Northcoast Executive
123. Grand Airways
124. The Krystal Company
125. GP Express
126. Business Express
127. Jet Aspen
128. Kiwi International
129. Conquest
130. Air 21
131. Sun Jet International
132. Mahalo
133. Air South
134. Western Pacific Airlines
135. Mountain Air Express
136. Pan American World
137. Euram Flight Center
138. Sunjet International
139. Eastwind Airlines
140. Access Air
141. Tower Air
142. Kitty Hawk
143. Pro Air
144. Fine Air Services
145. Legend Airlines
146. National Airlines
147. Trans World Airlines
148. Midway Airlines
149. Sun Country Airlines
150. Vanguard Airlines
151. USAirways
152. United Airlines
153. Hawaiian Airlines
154. Midway Airline
155. Great Plains

47. Northeastern Int'l	102. Midway Airlines	Airlines
48. Pompano Airways	103. Grand Airways	156. Atlas Air/Polar Air Cargo
49. Far West Airlines	104. Metro Airlines	157. USAirways
50. American Central	105. Mohawk Airlines	158. ATA Airlines
51. Provincetown Boston	106. Jet Express	159. Southeast Airlines
52. Sun West Airlines	107. Metro Airlines	160. Aloha Airlines
53. Wise Airlines	108. Northeast	161. Delta Air Lnes
54. Cascade Airways	109. America West	162. Comair
55. Wheeler Airlines	110. Midway Airlines	163. Northwest Airlines
56. Pride Air	111. Flagship Express	164. TransMeridian
57. Southern Express	112. Virgin Island Seaplane	165. Mesaba Airlines
58. Imperial Airlines	113. Trans World Airlines	166. Era Aviation
59. Arrow Airways	114. L'Express	167. Independence Air
60. Sea Airmotive	115. MarkAir	168. Florida Coastal
61. SFO Helicopter	116. Hermans / Markair Express	169. Kitty Hawk Aircargo
62. Trans Air		170. MAXjet Airways
63. Frontier Airlines		
64. Chicago Airlines		

* * *

As Table 4 reveals, while there have been several significant successful airline reorganizations in bankruptcy (e.g., America West, United, Delta and Northwest once, Continental and US Airways twice, and TWA thrice), the overwhelming majority of airline reorganizations have failed. If one defines success for a new company as surviving a decade without bankruptcy, the post-deregulation failure rate for start-up carriers is about 97%.[48] Moreover, the financial impact on investors and creditors has been unkind, even for the few carriers able to successfully reorganize under Chapter 11. By 2005, more than half the U.S. airline fleet capacity was flying in Chapter 11 bankruptcy.

* * *

E. Financial Risk

The airline industry is capital intensive, labor intensive, has high fixed costs, and low returns on investment. The industry suffers from severe business risk in the form of highly cyclical demand and intensive competition; it suffers severe financial risk

48. Dave Bates, *Debunking the Myth*, FLIGHT LINE, Apr. 1996, at 3.

in the form of high debt-to-equity ratios, which increase the variability of earnings and the chances of insolvency.[49] The industry has a high beta coefficient (high degree of volatility in the earnings), given the existence of high capital and high operating leverages.[50] By the end of the 1980s, airline equity and asset betas rose sharply.[51] Professor Gritta and his colleagues identified the inherent business risks in the airline business:

> - The presence of fixed costs in the operating structure of the firm. Often referred to as operating leverage, fixed costs act as a lever to increase the variability in operating profits as operating revenues change.
> - The presence of volatile input factor costs, such as labor and fuel. Cost control is far more difficult when input factor costs are unpredictable.
> - The cyclical nature of the business. Industries and firms that are cyclical . . . are higher in business risk than firms that are noncyclical.
> - The level of competition within the industry. The more competitive the industry, the greater will be the risk. Control over pricing becomes more difficult and thus revenues become unstable.[52]

* * *

With massive capital equipment requirements for aircraft, coupled with anemic profitability (plus LBOs and preferential treatment for aircraft under bankruptcy law), both well and poorly managed airlines loaded their balance sheets up with significant levels of debt. Yet firms with high business risk should attempt to limit their financial risk exposure.[53] According to Gritta and colleagues, "Financial theory holds that firms or industries high in business risk should shun the use of large

49. "The net result of overleverage can be explosive changes in rates of return to stockholders resulting from small changes in revenues." Richard Gritta, Garland Chow & Todd Shank, *The Causes and Effects of Business and Financial Risk in Air Transportation Operating and Financial Leverage and the Volatility in Carrier Rates of Return*, 6 J. TRANSP. MGMT. 127 (1994); *see also* Goodfriend, et al., *supra* note 46, at 2 n.4.

50. TANEJA, *supra* note 37, at 49.

51. TRANSP. RESEARCH BD., *supra* note 10, at 311.

52. Richard D. Gritta, Garland Chow & Edward Freed, *Business, Financial, and Total Risk in Air Transport: A Comparison to Other Industry Groups Prior to September 11, 2001*, 75 J. TRANSP. RES. FORUM 149, 150 (2003).

53. Gritta, Chow & Freed, *supra* note 52, at 154.

amounts of long-term debt to finance assets."[54] The high level of business and financial risk in the airline industry interact in a multiplicative manner to cause explosive volatility in returns on equity.[55] The airlines that have been liquidated are characterized by their high operating volatility and excessive debt finance.[56]

* * *

III. AIRLINE ECONOMICS

* * *

A. Supply

1. Airlines Inevitably Produce Excess Capacity. Excessive capacity is endemic to the airline industry. Whether regulated or deregulated, from the mid-1950s to the end of the 20th century, U.S. airlines rarely achieved an average annual domestic load factor exceeding 70% (and in most years load factors substantially below that, with domestic load factors worse still),[57] meaning in effect, on an annual basis, about one-third to one-quarter of available inventory consistently has remained unsold. As Figure 3, "U.S. Airlines Load Factors," reveals, in the airline industry, supply exceeds demand by a wide margin.

---

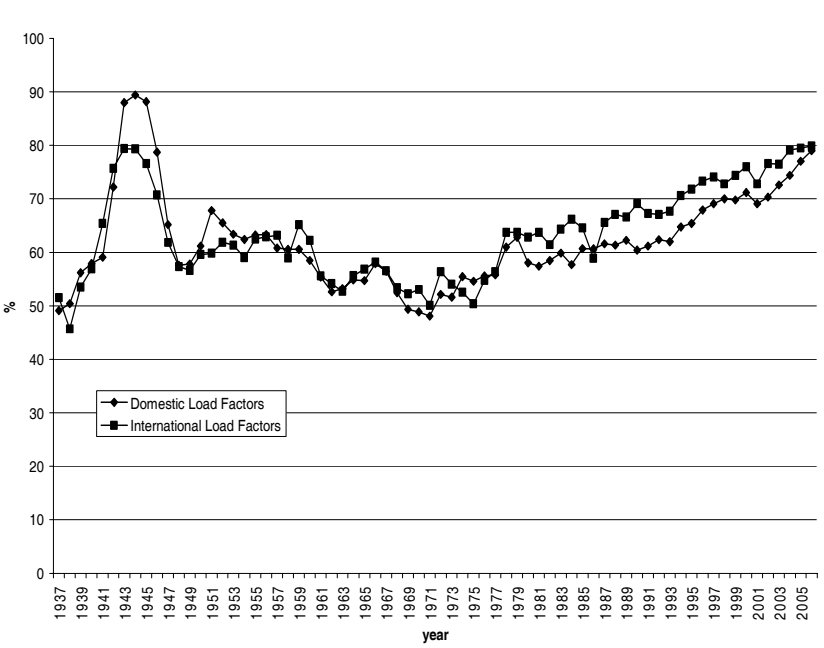
54. Richard D. Gritta, Garland Chow & Sergio Davalos, *Gauging the Financial Condition of the Major U.S. Air Carriers*, 71 J. TRANSP. L., LOGISTICS & POL'Y 116, 121–22 (2003).

55. Richard Gritta, James Seal & Jason Goodfriend, *The Instability and the Profitability of the Major U.S. Domestic Airlines: Risk and Return over the Period 1983–2001: A Comparison to Other Industrial Groups*, 11 CREDIT AND FIN. MGMT. REV. 21, 27 (2005).

56. Richard Gritta, Sergio Davalos, Garland Chow & Marcus Wang, *Small, U.S. Air Carrier Financial Condition: A Back-Propagation Neural Network Approach to Forecasting Bankruptcy and Financial Stress*, 56 J. TRANSP. RES. FORUM 109, 118 (2002).

57. Domestic load factors for U.S. carriers ranged between 60.5% and 62.6% between 1987 and 1993, while international load factors ranged between 65.6% and 67.0% during the same period. JULIUS MALDUTIS, QUARTERLY GLOBAL AVIATION REVIEW 2D QUARTER 10, 11 (1994). The Association of European Airlines reported load factors between 56.7% and 63.8% during the same period. *Id.* at 15.

Figure 3



The airline industry probably should always produce excessive capacity, for if airline load factors approached 100%, many people who wanted to fly would be prohibited from doing so. Studies by Boeing show that when load factors average 60%, 7% of flights will be full and unavailable for late-booking passengers. When load factors reach 70%, 21% of flights will have to turn away prospective passengers.[58] Thus, the higher the load factor, the more likely it is that some passengers will experience service inconvenience by finding their preferred departure fully booked.[59] Moreover, demand is highly cyclical, peaking and regressing at different hours of the day, days of the week, and months of the year. Demand also can ebb and flow, on a directional basis, depending on the season.

58. MICHAEL W. TRETHEWAY & TAE H. OUM, AIRLINE ECONOMICS: FOUNDATIONS FOR STRATEGY AND POLICY 5 n.3 (1992).

59. Melvin Brenner, *The Significance of Airline Passenger Load Factors*, *in* AIRLINE ECONOMICS 35, 35 (George W. James ed., 1982).

2. Airline Capacity Has a Short Shelf Life. Airline capacity has an exceptionally short shelf life. Once a scheduled flight pulls back from the jetway, any empty seats are lost forever.

* * *

In contrast, if a manufactured good cannot be sold, it can be left on the shelf or placed in a warehouse for a sunnier day. Hotel rooms are perishable too, but not nearly as perishable as airline seats, for everyone sleeps at the same time; not everyone travels from Boston to Chicago at the same time. A hotel room need be sold only once a day. A domestic aircraft has a fresh inventory of perishable seats every few hours.

Seeking to sell as much of that perishable inventory as possible, carriers often offer at least a portion of their inventory at the price of the lowest price provider in an effort to grasp an ascending and, too often, elusive breakeven load factor, and to preserve market share. As one source noted, "In a high fixed cost, price sensitive, commodity type business such as this, excess capacity has a devastating effect because it motivates carriers to fill aircraft by cutting prices. Other carriers are forced to match, and fare wars erupt."[60]

3. Excess Capacity Is Not Easily Reduced. As noted above, the acquisition of essential assets requires long lead times.[61] Thus, new aircraft orders must be placed years ahead of delivery, meaning that turning off the valve of growing inventory is difficult and costly, even when passenger demand softens as the market cycle turns south. Further, if demand slackens modestly, an airline cannot reduce capacity by shrinking the size of its aircraft. For example, if demand falls 10% in the Omaha–St. Louis market, an airline cannot reduce its costs appreciably by taking 10% of the seats off each of its aircraft. Aircraft configurations are relatively static (although sometimes smaller aircraft can be substituted in markets where traffic declines). A carrier might be able to take the capacity out of the Omaha–St. Louis market and reposition it in another city-pair market if demand is growing elsewhere (in the winter, for example, carriers adjust their fleets to add capacity in the north–south Sunbelt markets). But if the 10% decline in demand is a national phenomenon because of recession, an airline cannot curtail its costs by 10% by parking 10% of its fleet on the ground, for fixed costs are relentlessly high in the airline industry. A 10%

60. J.P. MORGAN SECURITIES, THE U.S. AIRLINE INDUSTRY (1993).

61. TANEJA, *supra* note 37, at 132.

reduction in a carrier's flights also reduces the appeal of its product in the markets in which service is reduced, weakening its network relative to its rivals and causing a significant forfeiture of revenue to them, while contributing little to arresting the overcapacity on the remaining 90% of its network.[62]

* * *

Additionally, network carriers have enormous difficulty downsizing hubs in order to take account of demand declines because every spoke in the hub feeds passengers to every other spoke in the hub, and vice-versa. Eliminating a spoke has a marginal detrimental impact throughout the system, for many (and often, most) passengers from each spoke connect with flights to other spokes. Instead, carriers typically maintain hub capacity but drop prices during demand downturns in an effort to cover variable costs,[63] deferring the day when prices can be raised until demand improves. In one sense, it is sometimes preferable for a carrier to abandon a hub than to downsize it. But abandoning a hub may be an invitation for a competitive carrier to enter the market.

* * *

B. Demand

1. Demand Is Highly Cyclical and Influenced by External Events. Long-term and short-term market cycles play a profound role in airline economics. Demand for air transport services has always been highly cyclical, with greater or lesser demand depending on time of day, day of week, and season, and on broader market fluctuations, year to year. For example, discretionary, leisure traffic (which has grown to be the dominant traffic base) peaks in the summer months, thereby allowing the industry to enjoy higher load factors for the second and third calendar quarters, while demand in the first quarter is typically poor. Leisure traffic peaks during Thanksgiving, Christmas, New Year's, Easter, Labor Day, and Memorial Day weekends.[64] Business traffic peaks between 7:00 to 9:00 on weekday mornings, and between 4:00 and 6:00 on weekday afternoons.

---

62. Robert L. Crandall, *The Unique U.S. Airline Industry*, *in* THE HANDBOOK OF AIRLINE ECONOMICS, *supra* note 23, at 5.

63. Variable costs are costs that change with the level of output, such as raw materials, wages, and fuel. PAUL SAMUELSON & WILLIAM NORDHAUS, ECONOMICS 74 (14th ed. 1992).

64. *See* TANEJA, *supra* note 37, at 131.

The seasonal variation is so profound that the peak month (August) has about 10%–20% more traffic than the trough month (January, domestically, and February, internationally). Domestically, the strongest months are June, July, and August, while internationally the strongest months are July, August, and September. For both domestic and international travel, the weakest months are December, January, and February.

On a daily basis, the peak day (Sunday, because for many passengers, Saturday night restrictions compel Sunday travel) is 26% stronger than the weakest day, Tuesday. And on an hourly basis, in many markets, peak periods of 9:00 A.M. and 5:00 P.M. far outpace demand at other hours of the day.[65]

The airline industry is highly sensitive to the business cycle, with economic performance correlating strongly with fluctuations in personal disposable income and GDP.[66] When the economy is growing and consumer confidence is strong, air transport demand grows, often improving airline load factors, and allowing carriers to raise yields and profitability. When the economy falls into recession, unemployment grows, and consumer confidence declines, individuals postpone discretionary travel and other luxury purchases (e.g., recreational vehicles), and airline load factors, yields, and profitability decline.

* * *

In addition, airline economic performance drops more deeply during recession than does the rest of the economy.

* * *

Traditionally, passenger traffic has grown at about 2.25 times the rate of GDP growth; thus, if the world economy grows by 2%, passenger demand should grow by approximately 4.5%. World air travel growth averaged 7.4% a year during the boom 1983–1989 period.[67] But worldwide, traffic fell 4% in 1991, the first decline since records have been kept.[68]

Many experts predict that global passenger demand will average 5%–6% annually over the next two decades,[69] although it

---

65. WILLIAM E. O'CONNOR, AN INTRODUCTION TO AIRLINE ECONOMICS 100 (5th ed. 1995); *see also* Brenner, *supra* note 59, at 35.

66. *See* Philip A. Baggaley, *Assessing an Airline's Credit Quality*, *in* THE HANDBOOK OF AIRLINE ECONOMICS, *supra* note 23, at 239.

67. Richard Evans, *Why the World's Airlines Can't Seem to Get Enough Cash*, GLOBAL FIN., May 1993, at 48.

68. *The Skies in 1992*, AIRLINE BUS., 1992, at 72.

69. *See Economic Benefits Study Revisited*, Int'l Civil Aviation Org., Feb. 1994, at 19.

will be spread unevenly, with intra- and inter-Asian markets growing at 8%–9% annually,[70] and North American, transatlantic, and European markets growing at only 4% annually.[71] Some analysts predict that traffic will have to grow about 8% in order for the U.S. airline industry to achieve sustained profitability, something it is not likely to do.[72] Others predict that the airline industry must earn operating margins of 8.5%, something it has never done, in order to finance its needed aircraft.[73]

* * *

2. Many Consumers View Air Transportation as a Fungible Commodity. By advertising a one way rather than a roundtrip price and by launching what sometimes seems to be an endless series of fare wars, airlines have conditioned consumers to hold unrealistic expectations of what a ticket should cost and to withhold discretionary spending until price wars erupt, as they eventually and inevitably do. Carriers typically match the prices of their competitors. All carriers fly essentially the same aircraft, and most offer less service; thus, most consumers view air travel as a fungible commodity.

Airline service is in the nature of a credence good. Before the ticket is purchased, it is difficult for a prospective passenger to know how pleasant the airline trip will be—the leg room, the meal, the courtesy of the cabin crew, the cleanliness of the aircraft, whether it will arrive and leave at its scheduled time, the smoothness of the flight, the size and personal hygiene of the passenger seated in the next seat, and so on.[74] Thus, it is difficult for an airline to differentiate its product on the basis of quality.

Having said that, one must concede that business class and first class is available for the passengers willing to pay the relatively higher differential price. But even here, business and

---

70. *See Has the Asian Bubble Burst?*, AIRLINE BUS., Oct. 1993, at 7; Press Release, Int'l Civil Aviation Org., Air Traffic to the Year 2003 (Oct. 1994). No matter who is making the predictions, all are tremendously optimistic for the Asia-Pacific passenger market. Seven of the ten most profitable airlines in the world in 1993 operated in this region. *Airline Business 100 Data*, AIRLINE BUS., Supp. 1994, at 59. The year before, twelve of the twenty most profitable airlines were domiciled in the Asia-Pacific Region. *Supra*.

71. WOLFGANG MICHALSKI ET AL., NEW POLICY APPROACHES TO INTERNATIONAL AIR TRANSPORT: MAIN ISSUES AND SUMMARY OF THE DISCUSSIONS 4 (1992), http://www.olis.oecd.org/olis/1992doc.nsf/ENGDATCORPLOOK/NT00000986/$FILE/AUE211.PDF.

72. *See* Evans, *supra* note 67, at 48, 53.

73. *See* Mullan, *supra* note 24, at 80.

74. DEMPSEY & GOETZ, *supra* note 26, at 276.

first class cabins have been flooded with coach-class upgrades, filling what once were empty seats (a positive development for passengers who would otherwise sit in the coach cabin; a somewhat negative development for the passengers paying the full price)—in essence, an egalitarian integration of the proletarian and bourgeois classes in confined quarters.

3. Brand Loyalty Is Soft. Passengers select an air carrier to serve their transportation needs based principally on the basis of schedule and price. Since most major airlines fly essentially the same aircraft, the product is deemed by many consumers as virtually indistinguishable, unlike hotels, which are able to differentiate their product by location, type of building, and quality of room. When a consumer purchases air transportation, she rents a seat for a few hours, sometimes receives a meal, and shares a public closet-like toilet. When a consumer purchases hotel services, she rents a bed, shower, sink, toilet, closet, television, and telephone for an entire evening, and enjoys it exclusively.

* * *

Some airlines have attempted to differentiate their product by offering better service—better food or more seat pitch, for example. Among new entrants, Midwest Express appears to be the most successful of these experiments. But most airlines have concluded that consumers still prefer schedule or price over service. Most flights are short in duration, and this limits the amount of meaningful product differentiation that can be accomplished.[75] Major airlines offer three classes of service on international and transcontinental routes, with business and first class seats priced at a much higher level than coach. Frequent flyer awards have also been created to attempt to induce consumer loyalty among high-yield business traffic, with some success. But most carriers tend to offer the same range of prices as their competitors (although the number of seats for which individual fares are offered may vary from one carrier to another), often making schedule the paramount means of product differentiation, particularly for business travelers.

4. Demand Is Highly Segmented. Air transportation is an intermediate good, the demand for which is derivative—the overwhelming number of passengers fly not for the sake of flying, but in order to travel somewhere and do something (e.g.,

75. *See* Crandall, *supra* note 62, at 4.

consummate a business agreement, or lie under a palm tree, sip a cold margarita, and watch the sun set). Thus, in order to assess passenger demand, it is useful to discern why people are traveling.[76]

As a consequence, there is not one market for air transportation services; there are several. Because business travelers typically need to travel on short notice and pay for air transportation with pre-tax dollars, they are less sensitive to price than are discretionary travelers. Again, schedule is often the determining factor in carrier selection.

In contrast, leisure/vacation travelers are relatively sensitive to price, and will take their discretionary dollars elsewhere with relatively small increases in price. They are less influenced by schedule and are typically able to plan their trips several weeks ahead of departure. Thus, there appear to be significant price elasticities of demand in the discretionary market.[77]

Leisure travelers who visit friends and relatives can also be price sensitive, depending on the reason which prompts the travel. Individuals who need to travel great distances on short notice because of friend or family illnesses, deaths, or other crises tend to be relatively price insensitive.[78]

The business travel market can also be divided into two broad segments.[79] Large purchasers of air travel (e.g., Fortune 1000 companies) can and do play airlines off against one another to extract contractual concessions on ticket prices that assure their employees are flown for the discretionary traveler's price, or something close to it, without the advance purchase, nonrefundability, and Saturday-night-stay-over requirements.

The chronic overcapacity from which the airline industry suffers affords unusually strong bargaining leverage to relatively larger purchasers of air travel, such as the U.S. government.[80] One might describe this as oligopsony power exerted by a small number of purchasers unilaterally able to dictate price—in this instance a price above variable costs but below fully allocated costs.[81] Ironically, however, demand for large businesses is relatively less price elastic than for small businesses.

---

76. O'CONNOR, *supra* note 65, at 103.

77. *Id*. at 98.

78. TRETHEWAY & OUM, *supra* note 58, at 17.

79. Paul Dempsey, *The Disintegration of the U.S. Airline Industry*, 20 TRANSP. L.J. 9, 19–20 (1991).

80. Crandall, *supra* note 62, at 6.

81. Fully allocated costs are variable (or out-of-pocket) costs plus an appropriate allocation of fixed (or overhead) costs.

In contrast, small businesses pay significantly higher prices for air transportation. Thus, small businesses seeking midweek travel on short notice are expected to bear the fixed cost burden. However, small businesses also are constrained by limited travel budgets from paying exorbitant prices for air travel (this reflects their price elasticity of demand), and will take fewer trips if forced to pay a price significantly above fully allocated costs. To the extent that small businesses are dissuaded from sending their sales force aloft to sell their products (vis-à-vis their larger competitors), one wonders whether this result is desirable from a public policy perspective, since small businesses create 90% of the nation's jobs.

Airlines have attempted to build brand loyalty, particularly among business travelers, with frequent flyer programs. Consumers who take more than 10 trips a year constitute only 8% of the air travel market but account for 45% of the trips taken and a disproportionate amount of revenue.[82] By giving the reward directly to the flying employees rather than the firm by which they are employed (and which is paying for their transportation), airlines incentivize repeat business with relatively less concern for price.

The market is also segmented according to distance. A passenger traveling only a few hundred miles ordinarily has surface transportation alternatives—bus, rail, or automobile. Thus, she is very sensitive to the relative price of alternative modes of transport. In contrast, a passenger traveling distances of more than about 2,000 miles is likely to be more concerned with time than price. But beyond a thousand miles, the existence of duplicative and overlapping competitive airline hub networks often compel airlines to price their product below fully allocated costs, despite the relative lower elasticity of demand of the long-distance traveler. For example, a passenger flying from Seattle to Philadelphia has a number of alternative airline competitors from which to choose to route her over their respective hubs (e.g., Delta over Atlanta, Salt Lake City, or Cincinnati, Northwest over Minneapolis or Detroit, United over Denver or Chicago, or American over Chicago or Dallas), each of which has ample excess seat capacity it would like to dispose of at a level above variable costs.

Most airlines attempt to tailor the price of travel to the demand elasticities of each of these demand segments. Through yield management, carriers offer various "buckets" of seats from

82. AIR TRANSPORT ASS'N OF AM., *supra* note 20, at 27–28.

lower to higher prices, the lowest fares usually encumbered with the most onerous restrictions (e.g., advance purchase, nonrefundability, Saturday night stay), extracting a higher proportion of fixed costs from relatively demand inelastic travelers. Fewer than 10% of passengers pay the full fare, which has risen well above the rate of inflation since deregulation; the average discount is about 65% off the full fare.

C. Costs

As noted above, airlines have relatively low variable, or out-of-pocket costs (typically fuel and labor), accounting for less than 20% of fully allocated costs. Fully allocated costs consist of all variable costs, plus some appropriate share of the fixed cost burden.[83] Fixed costs, or constant costs (which do not change depending on the amount of traffic served), are the dominant costs in the industry. The dividing line between fixed and variable costs is not always clear. Once aircraft are purchased, crews trained, and flights scheduled, arguably almost all costs are fixed.

One other difficulty is ascribing joint, or common, costs to particular passengers, particularly for network carriers, which must attempt to determine how much of the cost of flying from A to B must be attributed to the passengers connecting at B to the flight taking them on to C, or how much of the flight's cost should be attributed to the transportation of belly cargo, for example.

Thus, airlines suffer from the problem that most of their costs are joint costs, spread over an array of O&D and connecting passengers, and freight moving throughout their networks. Actual costs are obfuscated and difficult to ascribe to particular passengers. Rather than cost-based pricing, airlines tend to price on the basis of demand (imposing higher fares on less price elastic traffic, and offering lower fares to more price elastic traffic) and competition (following the price leader in a given market, or offering predatory prices to drive a competitor out).

As noted above, costs in the airline industry are typically measured in terms of available seat miles, since seats and distance are what is being sold. As a general rule, large aircraft tend to have lower available seat–mile costs than smaller aircraft. In addition, the industry enjoys a cost taper over distance, so that shorter flights ordinarily have higher CASM than longer flights.[84] This is because fuel consumption increases

83. O'CONNOR, *supra* note 65, at 72.

84. *Id.* at 71.

on takeoff and landings, and the aircraft preparation costs for both short and long stage lengths are similar. With more miles over which to spread these inputs, CASM decline over longer distances.[85]

Generally speaking, larger aircraft, flying longer distances, enjoy lower costs than smaller aircraft, flying shorter distances. Thus, the wide-bodied aircraft, like the Boeing 747, which flies more passengers over longer distances, has significantly lower CASM than do narrow-bodied aircraft like the 737. In turn, the 737 has lower CASM than do regional jets or turboprops. However, the block-hour and trip costs for smaller aircraft are lower than for larger aircraft, as a rule of thumb. Thus, the economics of smaller aircraft make better sense in thin, low-density markets unable to produce adequate loads to fill larger-capacity aircraft, if the carrier can attain higher revenue per seat to cover the higher CASM.

Network economies of scale and scope[86] have motivated most major airlines to increase the number of routes served from a centralized connecting airport—the infamous hub-and-spoke systems. On the marketing side of the equation, it allows carriers to offer a geometrically increasing array of city-pair products with every additional spoke. It also allows carriers to satiate consumer desires for frequent flights to that wide array of destinations. Hubs generate higher revenue and can create barriers to market entry.[87] But on the cost side of the equation, the impact is quite different.

This brings up a comparison of Southwest Airlines, which embraces the linear-route model, versus the major network airlines, which distribute passengers according to the hub-and-spoke model. Southwest offers high frequency point-to-point service in dense short-haul markets. By offering several nonstop flights a day between city-pairs, it satiates consumers' desires for frequent service. By utilizing its gates and ground services at

---

85. TRETHEWAY & OUM, *supra* note 58, at 4.

86. *Economies of scale* are realized when increases in total production simultaneously decrease unit costs; long-run average cost decreases as output increases. As the scale of production grows, the enterprise becomes more efficient. For example, a large capital-intensive piece of equipment operating at full capacity (such as a Boeing 747) can allow significantly lower ASM costs compared to a smaller aircraft (such as a Boeing 727). A related concept is *economies of scope*. The unit cost of producing one more item may be diminished when the scope of activity broadens. For example, advertising costs per unit of serving a particular city-pair market are lower the more city-pairs served, for the same ad can offer several city-pair product lines. Similarly, combination-carrier airlines can offer "belly" cargo service in their passenger markets.

87. Baggaley, *supra* note 66, at 241.

both endpoints throughout the day, Southwest enjoys economies of density.[88] Because it shuns connections and avoids congested airports wherever possible, Southwest enjoys greater productivity in the utilization of its aircraft and labor and consumes relatively less fuel than the network carriers.

While building an extensive network has enormous marketing and revenue advantages, it imposes significant costs. Hub-and-spoke carriers do realize economies of density at the hub airport; the recurring banks of passengers allow enhanced utilization of gate and ground personnel and equipment, at least at the hub, although hubbing requires the leasing of many more gates than does a linear-route system. By attempting to land and take-off large waves of aircraft at a central point, congestion causes delay (worsened when the weather becomes inclement), resulting in poorer aircraft and labor utilization, and increased fuel consumption.

Hubbing also has led airlines to invest in relatively smaller aircraft than was the trend before deregulation. In the early 1980s, enthusiasm for the relatively small Boeing 737 replaced orders for larger aircraft, for in hubbing, carriers do not need large aircraft to fly long distances; instead, they need small aircraft to fly relatively short distances. Thus, both the economies of aircraft size and stage length have been significantly sacrificed by hubbing. According to airline industry expert Melvin Brenner:

> The deregulation-encouraged emphasis on smaller planes means that the industry will be losing the unit-cost efficiencies of larger aircraft. Many of the costs involved in aircraft operation do not increase proportionately to increased plane size. The result is that larger planes normally provide greater seat-mile cost efficiency.[89]

In sum, that which drives the airline industry to produce excess capacity (the frequent overlapping ubiquitous hub-and-spoke networks) has forced an erosion of systemwide efficiency and productivity in the post-deregulation period. This has forced airlines to slow the pace of price decreases significantly from pre-

88. Yet another related concept to economies of size, or scale, is *economies of density*. By combining passengers and groups of passengers, an airline can carry the aggregation of passengers more cheaply than if it carried those passengers separately. Through careful scheduling of flights, consolidating operations, and routing passengers through its hub, an airline streamlines its system, making it more dense, and thereby reducing costs per passenger. Airline deregulation was predicated on the assumption that there were no scale economies in the airline industry.

89. *See* BRENNER ET AL., *supra* note 32, at 95.

deregulation trends, despite conventional wisdom to the contrary. From 1950 to 1978, productivity improvements (primarily attributable to the economies of scale of larger and larger aircraft flying longer distances, as well as advances in engine technology) allowed real yields to decline 2.5% per year on average. In contrast, from 1979 to 1993 real yield fell only 1.7% per year.[90]

Many carriers have inaugurated comprehensive efforts to cut costs. They have reduced or eliminated meals, reduced seat pitch, and deferred new aircraft purchases, for example. But in fact, most airline costs, including variable costs, are extremely difficult to manage. There is little an airline can do, for example, if the cost of Persian Gulf and West Texas crude begins to soar. Airline labor costs are theoretically pliable, except that most major airlines are highly unionized, and their work force is, and must be, highly skilled. Labor laws do not allow a unilateral lowering of wages or change of work rules by management without the kind of economic warfare and deterioration in labor–management relations no service industry can profitably endure. Airlines have used their oligopsony power to roll back travel agent commissions.[91] But for many airlines, even variable costs are either outside the company's control or extremely difficult to manage.[92] New entrant airlines, not burdened with union agreements, and with a junior work force, have a comparative cost advantage in terms of lower wages and less restrictive work rules.

Nonetheless, large airlines enjoy several economies of size compared to small airlines. One of the principal advantages of size consists of economies of information and transaction costs. An individual passenger knows a large network carrier can fly her to virtually any conceivable point. In contrast, it is costly for a new airline to inform the public it has opened a new route to Des Moines, and for the public to learn that there is now a new competitor in the Des Moines market.

As noted above, airlines appear to enjoy significant economies of density. Adding more flights or seats to an existing city-pair market will result in lower CASM, for it has only a modest impact on airport station costs (e.g., ticket counters,

---

90. ESG Aviation Servs., 7 THE AIRLINE MONITOR 1 (Nov. 1994).

91. *See* James C. Lanik, *Stopping the Tailspin: Use of Oligopolistic Power to Produce Profits in the Airline Industry*, 22 TRANSP. L.J. 509, 530–31 (1995).

92. *See* Crandall, *supra* note 62, at 5.

baggage handling, mechanics, and ground crew) and marketing costs (e.g., advertising).[93]

* * *

D. Price

The airline industry exhibits a relentless tendency both to produce excess capacity and to price its product near (and too often, below) fully allocated costs. The demand of consumers for schedule frequency produces tremendous excess capacity with no shelf life, pushing costs up. The widespread price elasticity of demand of discretionary travelers creates an environment where lowering prices will sell highly perishable inventory. The demand of consumers for low prices and a perception that air transportation is virtually a fungible commodity, as well as the desire of producers to sell as much of their abundant and perishable inventory as possible, drives prices down to levels which often fail to cover fully allocated costs.

Airlines are labor and fuel intensive.[94] Unlike most service industries, airlines are also capital intensive and, therefore, require tremendous investment in operating equipment and facilities, which regularly needs servicing, overhaul, and replacement.[95] Historically, airlines have spent 15% of annual revenue on capital equipment, more than double the average for manufacturing companies.[96] Also of note, the airline industry has relatively high fixed costs. Excessive capacity coupled with perishable inventory creates a tendency toward variable cost pricing. The incremental costs of adding a passenger to a scheduled flight are nil (e.g., a bag of peanuts, a cup of Coca-Cola, a few gallons of kerosene in the wings, and sometimes, a sales commission and other distribution costs). But industry costs are disproportionately fixed, with fixed costs for scheduled flights comprising between 80% and 90% of total costs.[97] As Melvin Brenner has observed, "[I]n air transport economics, the variable costs of filling an otherwise empty seat is close to zero. Thus, there is ever-present in this situation the encouragement of a

93. TRETHEWAY & OUM, *supra* note 58, at 10.

94. TANEJA, *supra* note 37, at 132.

95. AIR TRANSPORT ASS'N OF AM., *supra* note 20.

96. Gerard J. Arpey, *The Challenge of Airline Finance*, *in* THE HANDBOOK OF AIRLINE ECONOMICS, *supra* note 23, at 235.

97. Crandall, *supra* note 62, at 3.

pricing level that is less than compensatory in relation to fully allocated costs."[98]

In the long run, carriers must recover their fixed costs or face bankruptcy (as scores of airlines have learned). Individually, carrier behavior is rational. If one carrier lowers its price in a city-pair market (either because it wants to stimulate demand, consume excess capacity, attract market identity, or engage in predatory behavior), each competitor is faced with a Hobson's choice—either meet the lower fare, even if it fails to cover fully allocated costs, or hold its prices firm, which will cause it to lose even more revenue than if it met the new low price. Selling a seat below fully allocated costs is manifestly unprofitable over the long term. But any ticket sold at a price above the relatively low variable cost level makes some contribution to fixed costs, however small; an empty seat makes absolutely no contribution.[99] The result is that, in an effort to improve load factors, both the price leader and the price follower sometimes raise their breakeven load factors beyond attainable levels. Thus, capacity and pricing behavior of competing firms is sometimes individually rational, but collectively irrational.

These factors cause cost and price to fail to achieve equilibrium at a level which covers fully allocated costs and allows an adequate profit. In the absence of government oversight or market concentration, the inherent primordial economic characteristics of the airline industry appear often to propel it to engage in below-cost pricing for extended periods of time.

Carriers attempt to cover their fixed costs through cross-subsidization—by imposing relatively higher prices on inelastic travelers (e.g., small business travelers) or in less competitive markets (e.g., hub origin and destination O&D passengers) through yield management. According to economist F.M. Scherer, "Price discrimination can be practiced profitably only if the discriminator possesses some monopoly power."[100] The existence of monopoly power in some markets (and destructive competition in others) is antithetical to the theoretical notions of perfect competition and contestability, which fueled the engine of airline deregulation.

---

98. BRENNER ET AL., *supra* note 32, at 86.

99. *See* Crandall, *supra* note 62, at 5.

100. F.M. SCHERER, INDUSTRIAL MARKET STRUCTURE AND ECONOMIC PERFORMANCE 323 (2d ed. 1979).

E. Other Factors Influencing Economic Performance

Certain other factors influence airline economic performance. For example, the industry remains highly regulated and highly taxed by government. Airlines are highly dependent on governmental institutions for infrastructure, including airports and air traffic control, the efficiency of which directly effects the efficiency, productivity, and profitability of airlines. Technology turnover in the airline industry has been high. Technological breakthroughs by airframe or engine manufacturers can vastly improve airline performance. The airline industry is highly leveraged, financially and operationally, and many technological innovations in aviation have been the result of government—mostly military—financed research and development. A modest improvement or decline in load factors can have a profound impact on profitability.[101] Cumulatively, all of the factors described above make commercial aviation unique among industries.

F. Theory of Perfect Competition

Economic theory is examined here as it pertains to the question of regulation and deregulation. Here, we focus on the writings of three economists—Alfred Kahn, Elizabeth Bailey, and Michael Levine—who were most responsible both for providing an intellectual justification for deregulation and for implementing it. Kahn, a Cornell University economist, served as Chairman of the Civil Aeronautics Board (CAB) and President Carter's Chairman of Economic Advisors; Bailey, a Bell Labs economist, served as a member of the CAB; Levine, a University of Southern California law professor, was Director of the CAB's Bureau of Pricing and Domestic Aviation. (After deregulation, both Kahn and Levine assumed prominent positions in Frank Lorenzo's Texas Air empire). While not the first economists to criticize economic regulation of the airline industry,[102] these "Three Marketeers" were the individuals most responsible for deregulation of the airlines and the destruction of the Civil Aeronautics Board.

Economic theory has been an important catalyst in shaping U.S. aviation policy and providing an intellectual justification for the philosophical movement of neoclassical free-market (even

---

101. TANEJA, *supra* note 37, at 131–33.

102. *See, e.g.*, RICHARD CAVES, AIR TRANSPORT AND ITS REGULATORS 167–68 (1962); LUCILLE SHEPPARD KEYES, FEDERAL CONTROL OF ENTRY INTO AIR TRANSPORTATION 318 (1951).

laissez-faire) economics, which has manifested itself, *inter alia*, in deregulation. In many traditionally regulated industries, the "conventional wisdom" of both Republican and Democratic Administrations during the last quarter of the 20th century was that government can do no good, and the market can do no wrong.

* * *

Before they were deregulated, airlines were believed to be potentially naturally competitive, without economies of scale, scope or density, or significant barriers to entry. As Alfred Kahn said in 1977, "[E]very study we have ever made seems to show there are not economies of scale [in the airline industry]."[103] Thus, deregulation was deemed likely to produce neither undisciplined concentration nor destructive competition, despite the allegations of most airlines to the contrary.[104] According to Kahn, aircraft were merely "marginal costs with wings."[105] The Austrian economist, Joseph Schumpeter, observed, "Analytical work begins with material provided by our vision of things, and this vision is ideological almost by definition."[106] Laissez-faire ideology was a powerful force fueling the movement toward deregulation.

Many of the problems which are endemic to the airline industry—excessive capacity and inadequate profitability, for example—were deemed by free-market economists to have been created by regulation. According to Kahn, "[T]he answer to the fear of excessive capacity and low load factors, I am convinced, is to reverse the process that produces this kind of wasteful, cost-inflating service competition, by opening the door to price competition."[107] Yet, excess capacity remains a chronic and inescapable problem for the airline industry. The industry's financial performance has been profoundly worse since deregulation.

---

103. *Aviation Regulatory Reform: Hearing Before the Subcomm. on Aviation of the H. Comm. on Public Works and Transportation*, 95th Cong. 1137 (1977).

104. DEMPSEY & GOETZ, *supra* note 26, at 179–87, 221–34.

105. Said Kahn, with characteristic irreverence, "I really don't know one plane from the other. To me they are just marginal costs with wings." BARBARA STURKEN PETERSON & JAMES GLAB, RAPID DESCENT 77 (1994). Marginal costs are the costs of producing one extra unit of output, given a particular level of production. SAMUELSON & NORDHAUS, *supra* note 63, at 74.

106. JOSEPH SCHUMPETER, HISTORY OF ECONOMIC ANALYSIS 42 (Elizabeth Schumpeter ed., 1954).

107. Alfred E. Kahn, Address Before the New York Society of Security Analysts, *in Kahn Urges New Approach to Tariffs*, AVIATION WK. & SPACE TECH., Mar. 20, 1978, at 41 [hereinafter Kahn Address].

In articulating a theoretical justification for deregulation of the airline industry, deregulation proponents embraced neoclassical economic analysis, first using the model of perfect competition, and later, the more recently developed contestability theory.[108] A perfectly functioning market requires several ingredients. Property rights must be privately held, exclusive and transferable. Individual actors in the market must act independently, have perfect information, and behave rationally. Transaction costs and externalities must be insignificant. No single producer or consumer may have market power; none may have the ability to influence price unilaterally (all are price takers, and the market has an atomistic structure). Each firm faces a horizontal demand curve, along which it may sell as much or little as it chooses.[109] Entry and exit barriers must be absent, and resources employed or potentially employable must be mobile. Given these assumptions, the market will clear at a price and level of output which reflects the optimum allocation of society's resources. Consumers purchase goods at prices closely approximating their marginal and average costs of production.[110]

A more formal definition of the theory of perfect competition, described by what it contains, has been proffered by several economists:

- *The product is homogeneous*. In other words, the product sold by each firm is perfectly substitutable for the product sold by every other firm in the industry.
- *The number of buyers and sellers is large*, each one of whom buys or sells only a small fraction of the products bought and sold in the market. No single buyer or any one seller can influence price. Each acts independently.
- *Barriers to entry and exit in the market are relatively small.*
- *All participants in the market, buyers and sellers, are adequately informed* about prices, quality, quantity, and other essential facts.[111]

---

108. *See* Michael E. Levine, *Airline Competition in Deregulated Markets: Theory, Firm Strategy, and Public Policy*, 4 YALE J. REG. 393, 399 (1987) (analyzing recent literature on deregulation).

109. PAUL SAMUELSON, ECONOMICS 484, fig.1(a) (1985).

110. *See generally* SCHERER, *supra* note 100, at 10–11; GEORGE J. STIGLER, ESSAYS IN THE HISTORY OF ECONOMICS 234–67 (1965).

111. *See* EDWIN DOLAN, ECONOMICS 551, 552 (4th ed. 1986); ROGER MILLER,

In one sense the product is, indeed, relatively homogeneous—airlines fly essentially the same aircraft, with similar seat configurations and in-flight amenities. In another sense it is not—carriers can differ significantly in the quantity and schedule (timing) of flight frequencies they offer and the number and array of destinations they serve. Quality can also differ marginally between carriers.

The number of buyers of air transportation is extremely large (well over one billion per year, globally); the number of sellers is relatively large on a national basis, providing a wide array of connecting alternatives for trips more than about 1,000 miles. However, the economics of aircraft size dictate that most nonstop city-pair markets can only support one or two carriers on a nonstop basis,[112] and most hubs are dominated by a single airline, which can and do extract monopoly rents (the ability to raise prices above competitive levels, which produces a wealth transfer from consumers to producers, and thereby a regressive misallocation of resources). Thus, many air transportation markets are dominated by relatively few sellers. Oligopolists tend to compete on the basis of advertising or product differentiation, rather than price.[113] There is relatively little room for product differentiation in airline service except on the basis of schedule, and airlines tend to offer their product up at a fairly standard price (all airlines tend to meet the lowest price in the market, at least on some portion of its inventory, so as to not suffer a diversion of revenue to competitors). Because capacity is excessive and revenue is inadequate, the airline oligopoly functions poorly as wealth-maximizer, except in markets where exceptionally high levels of concentration exist.

Further, buyers with significant annual travel (typically Fortune 1000 companies) can and do exercise their oligopsony power to influence price downward. Many successfully negotiate a discretionary traveler price contract, without the advance purchase and Saturday-night-stay-over restrictions.

The issue of barriers to entry and exit in the market is a more complicated one, and closely related to contestability theory, to be discussed below.

Further, many consumers lack perfect information because, with hundreds of thousands of pricing changes daily, many laden

---

ECONOMICS TODAY 474–57 (5th ed. 1985).

112. *See* ELIZABETH BAILEY, DAVID GRAHAM & DANIEL KAPLAN, DEREGULATING THE AIRLINES 4 (1991).

113. ROBERT HEILBRONER & LESTER THUROW, UNDERSTANDING MICRO-ECONOMICS 179 (1975).

with complicated restrictions, the labyrinthine pricing system raises the transaction costs for individual consumers of finding the most desirable combination of fare and restrictions (although internet providers are unscrambling the fares for price-conscious travelers). The fare, or the number of seats for which discounted fares are available, may change radically between the time the trip is booked and the journey is begun, meaning that a passenger who locked into a particular price with a nonrefundable ticket may pay more or less than the person seated next to him or her who purchased their ticket subsequently. Major airlines also encourage travel agents to obfuscate the better bargains by offering them commission overrides.

And what of the free market economists' view of the rational economic man? Why does he seem not to dwell in the land of commercial aviation? Is it the industry's glamour, defiance of gravity, or just the sex appeal of aviation that draws investors to this industry with such remarkably poor returns on investment? While most free marketeers assume rational behavior in terms of individual maximization of self-interest (broadly defined) and consistency (narrowly defined), a new generation of economists is adopting a more realistic and comprehensive view of man's behavior.

Some, such as economist Herbert Simon, have redefined rationality to acknowledge it is "bounded"—the ability of people to make self-interested choices is limited by a lack of information of the cost of gathering and interpreting it. Economist Kevin Murphy assumes people make rational choices, but their range of options and preferences is influenced and sometimes limited by factors outside their control. Others, such as economist Richard Thaler, attempt to devise economic models based on individual behavior which is rational most, but not all, of the time.[114]

Economist Brian Arthur says the problem with mainstream economics is that it assumes that people have vast deductive capabilities. A game of chess between two rational expectations economists, he says, would consist of two hours of silence as the players worked out all the moves; then one would resign. In fact, people play chess (and tackle other complex tasks) by spotting patterns and employing predictive rules of thumb. People also tend to pay excessive attention to recent data and insufficient attention to long-run averages and statistical odds.[115] From a

114. RICHARD THALER, THE WINNER'S CURSE (1994).

115. *Rational Economic Man*, THE ECONOMIST, Dec. 24, 1994, at 90.

macroeconomic perspective, the swing in the business cycle appears to be a collectively irrational phenomenon. John Maynard Keynes blamed these swings on the mood ("animal spirits") of entrepreneurs.[116]

Aside from the above-described excessive exuberance for new airline ventures, there is a lot of lemming-like behavior in the ranks of airline management. In the post-deregulation period, major airlines have gone through a series of waves of building hubs, acquiring smaller rivals, purchasing international routes, micromanaging yield, creating linear route "airlines within an airline," entering into global alliances, closing hubs, and cost cutting, in a frantic struggle to be King of the Hill (at one moment), or simply a surviving life form (at another). What one group of carriers does, the others seem compelled to emulate. This seems to fit with Kevin Murphy's view that people may rationally choose to adopt irrational social norms.

Because of the economies of scale related to aircraft size, as well as the fact that thin markets cannot accommodate multiple competitors successfully, it was clear that deregulation would not produce a proliferation of a large number of sellers (carriers) in individual markets (nonstop city-pair routes). In fact, the overwhelming majority of nonstop city-pair markets are so thin as to suggest they may be natural monopolies. Hence, the success of deregulation could not be measured according to the theory of perfect competition.[117] This led proponents of airline deregulation to embrace a modified version of the perfect competition model—the theory of contestable markets.[118] Although it has had various

---

116. *A Vicious Cycle*, THE ECONOMIST, Mar. 18, 1995, at 14 (discussing the business cycle).

117. *See* BAILEY ET AL., *supra* note 112, at 4 (discussing airline deregulation).

118. *See* WILLIAM J. BAUMOL, JOHN C. PANZAR & ROBERT D. WILLIG, CONTESTABLE MARKETS AND THE THEORY OF INDUSTRY STRUCTURE 7 (1982); Elizabeth E. Bailey & John C. Panzar, *The Contestability of Airline Markets During the Transition to Deregulation*, 44 LAW & CONTEMP. PROBLEMS 125, 125–26 (1981). Airline deregulation was a seeming attempt to return to a world of competitive capitalism, where there would be many competing companies, and where the "invisible hand" of the marketplace would drive the price of service to consumers to its lowest practical level. And if actual competition did not exist, there would be the illusion of competition created by the threat of a real competitor. *See generally* ADAM SMITH, AN INQUIRY INTO THE NATURE AND CAUSES OF THE WEALTH OF NATIONS 421 (Edwin Cannan ed., 1776). The reference here is to the "contestable market theory," that as a revived notion became a premise used to help justify adoption of the deregulatory policy in transportation. The contestable market theory was first identified by Adam Smith in *Wealth of Nations*. *Id*. The contestable market assumption is that there are no significant economies of scale or barriers to entry. Because there are no barriers to entry, the market, even in the absence of actual competition, is threatened (i.e., "contested") by a prospective new entrant. Hence, the market is expected to behave in a perfectly competitive way. Assumed is that potential entrants are as viable in the competitive marketplace as actual competitors. Kyle and Phillips summarize the

formulations,[119] the essential components are three: (1) costless entry and exit (no sunk costs); (2) price sustainability; and (3) equal access to economies of scale and technology[120]—in essence, costless entry and exit at efficient scale.[121] According to Alfred Kahn:

> [A]lmost all of this industry's markets can support only a single carrier or a few. Their natural structure, therefore, is monopolistic or oligopolistic. This kind of structure could still be conducive to highly effective competition if only the government would get out of the way. The ease of potential entry into these individual markets, and the constant threat of its materializing, could well suffice to prevent monopolistic exploitation.[122]

A decade after deregulation, 64% of nonstop U.S. city-pair markets were monopolies—they were served by only a single carrier—while 85% were (perhaps natural) monopolies or duopolies.[123] Unlike the theory of perfect competition, contestability theory does not require that a number of firms compete in a given market in order to produce efficient performance.[124] Since entry was thought to be costless, an airline which raised prices above or restricted output below competitive levels would be faced with new competitors attracted like sharks to the smell of blood—"hit-and-run" entry, as it was described.[125] Since incumbent airlines knew this to be the case, or would be

---

contestable market theory as follows:

> Put simply, this theoretical framework indicates that in markets characterized by relatively costless entry and exit, the potential for entry, regardless of the actual number of incumbent competitors, will result in competitive behavior and performance. Thus, if airline markets are highly contestable, fares should approximate marginal cost, even in a market served by one carrier.

Reuben Kyle III & Laurence T. Phillips, *Airline Deregulation: Did Economists Promise Too Much or Too Little*, 21 LOGISTICS & TRANSP. REV. 3, 9 (1985); *see also* DEMPSEY & GESELL, *supra* note 4, at 408 n.92.

119. Actually, the foundations of contestability theory, particularly costless entry and exit at efficient scale, were laid in Harold Demsetz, *Why Regulate Utilities?*, 11 J. L. & ECON. 55, 60–61 (1968).

120. *See* BAUMOL ET AL., *supra* note 118, at 6–7; William J. Baumol, John C. Panzar & Robert D. Willig, *Contestable Markets: An Uprising in the Theory of Industry Structure: Reply*, 73 AM. ECON. REV. 491 (1983). A different formulation was offered by Elizabeth Bailey and her co-authors: "(1) all factors of production are mobile among markets, (2) consumers are willing and able to switch quickly among suppliers, and (3) existing firms are unable to change their prices quickly in response to the entry of a new firm." BAILEY ET AL., *supra* note 112, at 153–54.

121. Levine, *supra* note 108, at 405.

122. Kahn Address, *supra* note 107, at 41.

123. DEMPSEY & GOETZ, *supra* note 26, at 233.

124. Levine, *supra* note 108, at 404.

125. BAILEY ET AL., *supra* note 112, at 153.

quickly educated by new entrants, they would be dissuaded by the threat of entry materializing from extracting monopoly rents.

Contestability theory posits that entry and exit are costless. But neither is costless in the airline industry, and sustained entry is quite difficult. Certainly, aircraft are mobile and can land wherever there is a landing strip of adequate length (assuming an available gate and landing slot). But it takes more than a takeoff and landing to start an airline. A firm must make a substantial investment in preoperating costs—assembling the financing, securing FAA and DOT regulatory authorizations (most of a safety and fitness nature), assembling management and operational employees and training them, securing office space and equipment, aircraft, ground equipment and services, airport gates, maintenance facilities, and the like.

Even an existing airline incurs "ramp up" costs in opening a new market, marketing the new city-pair product, generating consumer familiarity with the carrier, and establishing patronage, which can consume several months of operation before breakeven load factors are achieved (assuming the absence of a predatory competitive response).[126] Most of these preoperating and "ramp up" costs are sunk costs; they are not recoverable if an airline leaves the market.[127]

Consumers have greater familiarity with an incumbent's service, reliability, and schedule than a new entrant's. In order to generate some level of consumer interest in and familiarity with the new service, a new airline typically enters a market with a heavily advertised promotional fare, which may be below fully allocated costs absent an exceptionally high load-factor. But computer reservations systems allow almost instantaneous matching of the discount fare (some airlines have programmed their yield management software to automatically match new competing fares in a given market). The fact that the incumbent's prices are not "sticky" increases the cost of new entry.[128] New carrier entry typically does drive down prices, at least in the short run (until the new rival is driven from the market). Since sunk costs are not trivial, and an incumbent can respond in price and quantity as quickly as a new competitor can enter, the mere threat of hypothetical new entry materializing apparently has

126. *See* BAILEY ET AL., *supra* note 112, at 154; Russell A. Klingaman, *Predatory Pricing and Other Exclusionary Conduct in the Airline Industry: Is Antitrust Law the Solution?*, 4 DEPAUL BUS. L.J. 281, 305–06 (1992).

127. Michael Levine, *Airline Deregulation: A Perspective*, 60 ANTITRUST L. J. 687, 688 (1991).

128. *See* BAILEY, ET AL., *supra* note 112, at 154.

little effect on an incumbent's pricing, contrary to the essential tenet of contestability theory.[129]

An incumbent airline can respond to new entry in a predatory fashion, for example, by matching its low fares on frequencies in close proximity to the new entrant's departures, meeting the new competitor's introductory fares and locking them in (i.e., refusing to follow the new price leader's fares up after the promotional period), dumping additional capacity (flights, or seats) into the market, or sandwiching the new competitor's frequencies (with a departure within a few minutes on both sides of the new entrant's departure) until the new entrant is financially exhausted and withdraws.[130]

* * *

"Predatory pricing" has been defined as pricing below an appropriate measure of cost for the purpose of eliminating competitors in the short-term and reducing competition in the longterm.[131] Under neoclassical free-market theoretical beliefs, such predation is irrational, for the dominant firm engaging in the predatory behavior must be able to recover the short-term losses it incurs in the longer term after it has driven the new entrant from the market; since it can never hope to recover its short-term losses, it will not likely engage in such predation, at least in theory. Hence, many neoclassical economists argue that predatory pricing schemes are rarely attempted, and even more rarely are they successful.[132]

Despite the theoretical opposition to predation based on its hypothetical irrationality, airline observers have seen numerous examples of predatory behavior in the airline industry attempted since deregulation, with various degrees of success. Evaluating the post-deregulation experience, during which he served as CEO

---

129. *See id.* at 164; Severin Borenstein, *The Evolution of U.S. Airline Competition*, 6 J. ECON. PERSPECTIVES 45, 53 (1992).

130. *See* Levine, *supra* note 108, at 417; *see also* Paul Stephen Dempsey, *Predatory Pricing & Monopolization in the Airline Industry: A Case Study of Minneapolis/St. Paul*, 29 Transp. L.J. 129 (2002); Paul Stephen Dempsey, *Predation, Competition & Antitrust Law: Turbulence in the Airline Industry*, 67 J. Air L. & Com. 685 (2002).

131. Cargill, Inc. v. Monfort of Colo., Inc., 479 U.S. 104, 117 (1986); *see also* Weyerhaeuser v. Ross-Simmons, 127 S. Ct. 1069 (2007); Brooke Group v. Brown & Williamson Tobacco, 509 U.S. 209 (1993).

132. *See, e.g.*, ROBERT H. BORK, THE ANTITRUST PARADOX: A POLICY AT WAR WITH ITSELF 149–55 (1978); Phillip Areeda & Donald F. Turner, *Predatory Pricing and Related Practices Under Section 2 of the Sherman Act*, 88 HARV. L. REV. 697, 699 (1975); Frank H. Easterbrook, *Predatory Strategies and Counterstrategies*, 48 U. CHI. L. REV. 263, 268 (1981). This view was embraced by the U.S. Supreme Court in *Matsushita Electric Industrial Co.. v. Zenith Radio Corp*., 475 U.S. 574, 588–90 (1986).

of a small airline (New York Air), Levine concluded, "I believe predation is possible and that it occurs . . . . [I]t is possible for an incumbent to impose on prospective entrants nonrecoverable costs by pricing in a way that seeks to ensure that they do not attract a significant share of passengers regardless of the incumbent's own costs."[133] Kahn concurred, criticizing Northwest Airlines for its "scorched-earth" policy of substantially undercutting People Express's price while simultaneously increasing the number of flights in the market, saying:

> If predation means anything, it means deep, pinpointed, discriminatory price cuts by big companies aimed at driving price cutters out of the market, in order then to be able to raise prices back to their previous levels. I have little doubt that is what Northwest was and is trying to do.[134]

An established carrier which finds its spokes assaulted by a new entrant typically will cut prices to meet the competition. Both will lose money, but deeper-pocketed large carriers have the ability to cover short-term revenue losses from profits derived from less competitive markets.[135] Typically, the major airlines offer the low fare only on local O&D traffic on a large volume of seats on flights in close time proximity to the new entrant's, extracting higher yields from passengers connecting to the assaulted spokes. This revenue advantage may neutralize the new entrant's cost advantage and will deleteriously impact its staying power.[136] Levine notes, "The ability of an incumbent to respond rapidly and cheaply to the prices and output of new entrants contradicts perhaps the most critical assumption of contestability theory."[137]

Although many neoclassical economists continue to cling to the notion that predation is irrational and therefore highly unlikely to exist, modern economics literature has developed a theoretical model which supports the notion that dominant firms may attain monopoly power by placing their competitors at a competitive cost disadvantage.[138] In the airline industry, this may be reflected in vertical agreements between airlines and airports

---

133. Levine, *supra* note 127, at 687, 689.

134. Alfred Kahn, *The Macroeconomic Consequences of Sensible Microeconomic Policies*, SOC'Y. GOV'T. ECONOMISTS NEWSLETTER, May 1985, at 6.

135. Peter C. Cartensen, *Evaluating 'Deregulation' of Commercial Air Travel: False Dichotomization, Untenable Theories, and Unimplemented Premises*, 46 WASH. & LEE L. REV. 109, 126 (1989); Klingaman, *supra* note 126, at 304–05.

136. Levine, *supra* note 108, at 451.

137. *Id.* at 393, 452.

138. Thomas G. Krattenmaker & Steven Salop, *Anticompetitive Exclusion: Raising Rivals' Costs to Achieve Power over Price*, 96 YALE L.J. 209, 243–48 (1986).

which tie up gates in longterm leases or prohibit airport expansion through majority-in-interest clauses, allowing the incumbent to charge monopoly rents for gate subleases. Raising rivals' costs may also be reflected in a dominant hub carrier's refusal to enter into ticketing-and-baggage, joint-fare, or codesharing with smaller regional jet carriers, and other violations of the "essential facilities doctrine."

* * *

In one sense, barriers to entry appear deceivingly small and were deemed inconsequential by deregulation's architects. As former DOT Assistant Secretary Matt Scocozza said, "In 1978 we envisioned that there would be a hundred airlines flying to every major hub."[139] A large used-aircraft leasing market and a large number of skilled workers (individuals who had been laid off by the major airlines or lost their jobs because of major carrier liquidation) were available in the early 1990s.

Despite their financial collapse, airlines remained a glamorous industry. Coupled with investor and lender enthusiasm for new airline ventures, this led to the emergence of a number of new airlines. But entering and surviving are two entirely different things.[140] More than a hundred new airlines have emerged since deregulation, and the overwhelming majority has collapsed in bankruptcy. Even entering a single market where the incumbent enjoys supracompetitive profits is difficult, given that the overwhelming number of nonstop city-pair routes appears able to support only a single airline, and that new entry must manifest itself inflexibly in plane-load lots.[141]

Barriers to entry have been defined as "any factor that prevents a new firm from competing on a equal footing with existing firms."[142] These factors are numerous in the airline industry, including the consumption by incumbent airlines of airport gates and landing slots.

Economies of scale, scope, and density also appear to exist in the airline industry, although the fact that new entrant airlines have lower CASM than established major airlines might suggest the contrary to those who do not look more deeply. Larger aircraft, and larger fleets of aircraft, afford carriers scale

---

139. *The Frenzied Skies*, BUS. WK., Dec. 19, 1988, at 70.

140. O'CONNOR, *supra* note 65, at 7.

141. MELVIN BRENNER, JAMES LEET & ELIHU SCHOTT, AIRLINE DEREGULATION 50 (1985).

142. DOLAN, *supra* note 111, at 602.

economies in terms of lower unit (i.e., available seat mile) operational and maintenance costs. There are the informational economies associated with incumbency—a small carrier must invest in relatively higher advertising, marketing, and ramp-up costs in introducing its service to a city-pair market, while a large established carrier adding that city-pair to its existing hub network has relatively lower start-up costs.

Likewise, there are the economies of scope that are achieved as a carrier increases frequency in a market (spreading more customers over its station costs, for example), as well as the impact enhanced frequency has on demand for its product (the carrier with more frequency enjoying a disproportionately larger share of passengers paying higher-yield revenue). And, there are the network economies a hub carrier enjoys by adding a spoke to an existing hub network, offering a vast increase in the number of city-pair products it can offer. According to Levine, "We have seen the creation of a large number of hub monopolies because of the economies of scope and scale at hubs."[143] Kahn has insisted, "We advocates of deregulation were misled by the apparent lack of evidence of economies of scale."[144]

Add to network economies the vast increase in product lines that are added when large networks are joined together in codesharing relationships, relationships from which new entrants are generally excluded. In fact, some carriers refuse to enter into joint-fare and codesharing relationships with virtually all domestic jet carriers in the continental United States flying aircraft larger than regional jets.

Then there are the "induced" scale and scope effects, including frequent flyer programs (for which larger network carriers have a manifest advantage compared to their smaller competitors), which attract higher-yield business travelers, and travel agent commission overrides, which essentially bribe agents to steer business toward the carrier which offers them. These have been described in the literature as the "principal-agent" problem.[145] As Levine has noted, "by constructing incentive commission programs and by inventing frequent flyer programs, big airlines learned to create economies of scope and scale that are not necessarily present in the basic technology."[146]

---

143. Levine, *supra* note 127, at 693.

144. Alfred E. Kahn, *Surprises of Airline Deregulation*, 78 AM. ECON. REV. 316, 318 (1988).

145. *See* Stephen A. Ross, *The Economic Theory of Agency: The Principal's Problem*, 63 AM. ECON. REV. 134, 134, 138 (1973).

146. Levine, *supra* note 127, at 690; Levine, *supra* note 108.

Levine catalogued the multitude of developments not anticipated by the pro-deregulation economists—mergers and consolidations, vertical integration, hub-and-spoke systems, complicated fare structures, frequent flyer programs, travel agent commission overrides, computer reservations systems, slot and gate monopolies, predation, and the high mortality rate among new entrants. From these developments, he concluded:

> [T]hese unanticipated effects of deregulation seem to stem from the economics of information and from related economies of scope and scale, and from production indivisibilities (such as the problems of providing frequent and convenient service in city-pair markets with small traffic flows) . . . . Frequent flyer programs, the importance of travel agents and travel agent incentive programs, computer reservations systems, and hub and spoke systems all are techniques of utilizing economies of scale and scope to take best advantage . . . of the costs of communicating a complex web of services and service attributes to consumers . . . . The information and transaction costs are real . . . .[147]

Finally, equal access to technology essentially exists on the operations side of the equation. If it has adequate financial resources, a new airline can buy or lease a Boeing 737 or Airbus 320 nearly as easily as an established airline can, albeit not at the same price. On the distribution side of the equation, the largest airlines established the computer reservations systems, through which the vast majority of flights were sold, giving them superior access to proprietary information regarding their competitors' sales, and were incentivized to display their competitors' flights more poorly (for example, CRSs add the equivalent of 24 hours in time to noncode sharing connections so as to push them off the first page of the screen, where 85% of seats are sold), and earn significant revenue from their competitors' CRS bookings and sales. Some newer entrants responded by attempting to sell their products directly to consumers through 800 toll-free telephone numbers and heavy advertising or via the Internet. The major airlines have since divested themselves of CRS ownership, ameliorating their anticompetitive potential.

Most empirical studies have demonstrated that deregulated airline markets are not perfectly contestable[148] and that there is a

147. Levine, *supra* note 108 at 423.

148. The first article to cast doubt on the applicability of contestability theory to the airline industry was David R. Graham, Daniel P. Kaplan & David S. Sibley, *Efficiency*

positive relationship between concentration and fares.[149] While ticket prices in city-pair markets with two competitors were about 8% lower than in monopoly markets, and markets with three competitors were another 8% less still, a potential competitor has one-tenth to one-third the competitive impact of an actual competitor.[150] The exit of a competitor results in a 10% average price increase for the remaining incumbents.[151] Other studies reveal that the number of competitors is not nearly as significant as their identity (e.g., Southwest's presence in a market creates deeper pricing competition than, say, Delta's).[152] Some deregulation apologists have insisted that the airline industry is "imperfectly contestable."[153] Without doubt, imperfection is an appropriate adjective to describe airline economics.

* * *

The consensus among economists today is that the airline industry does not reflect theoretical notions of perfect competition or contestability. The high degree of pricing discrimination between consumers and markets suggests that the industry may better reflect economist Joan Robinson's theory of "imperfect competition"[154] or Edward Chamberlin's theory of "monopolistic competition."[155] But the strikingly inadequate level of industry profitability in the post-deregulation environment suggests that airlines have not yet transformed themselves into an efficient competitive model, or they cannot (because relentlessly excessive capacity prohibits pricing at a level able to generate reasonable profitability), further suggesting that the "destructive competition" model may best describe the airline industry. But "self destructive" also seems an adequate descriptor of the airline industry as well.

By year's end 2005, the U.S. airline industry was on the brink of destruction. Through its ups and downs, from 1947

---

and Competition in the Airline Industry, BELL J. ECON. 118, 137 (1983).

149. *See* James A. Brander & Anming Zhang, *Dynamic Oligopoly Behavior in the Airline Industry*, 11 INT'L J. OF INDUS. ORG. 407, 408–09 (1993) (listing sources).

150. Borenstein, *supra* note 129, at 53.

151. *Id*. at 54.

152. *See* William N. Evans & Ioannis Kessides, *Structure, Conduct, and Performance in the Deregulated Airline Industry*, 59 SOUTHERN ECON. J. 450, 460 (1993) (listing sources).

153. Steven A. Morrison & Clifford Winston, *Empirical Implications and Tests of the Contestability Hypothesis*, 30 J. L. & ECON. 53, 59, 63 (1987).

154. JOAN ROBINSON, THE ECONOMICS OF IMPERFECT COMPETITION 169–70 (1933).

155. EDWARD H. CHAMBERLIN, THE THEORY OF MONOPOLISTIC COMPETITION 321 (1933).

through the year 2000 the industry realized a cumulative net income of $18.2 billion. Unfortunately, over fifty years of accumulated capital was quickly consumed by a net loss of $34 billion between 2001 and 2005, and conditions would continue to worsen not only domestically but globally. Internationally, the industry lost $42 billion between 2001 and 2005.[156] Scores of carriers, both new entrants and incumbents, collapsed into bankruptcy.[157] At one point, half the fleet capacity of the U.S. airline industry was mired in Chapter 11.

* * *

G. Theory of Economic Regulation

The phenomenon of destructive competition has long been recognized as an appropriate rationale for government regulation.[158] In fact, destructive competition was a primary rationale for airline economic regulation in the 1930s.[159] Although imperfect, regulation attempted to solve the problem by attempting to rationalize capacity and stabilize pricing. Nonetheless, as the national route network expanded during the ensuing decades, passenger traffic grew and real prices fell at faster rates than in the post-deregulation era.

In the mid-1970s, two lawyers—Philip Bakes (subsequently a lieutenant of CAB Chairman Alfred Khan, and Texas Air's Frank Lorenzo) and Stephen Breyer (now a U.S. Supreme Court Justice)—were architects of Congressional airline deregulation as aides to Senator Ted Kennedy. In reviewing the allegation that "competition would force the airlines to charge prices that covered only variable, but not fixed, costs," they concluded that there was no evidence that destructive competition did (prior to regulation) or would (subsequent to deregulation) occur.[160]

As Chairman of the CAB, Alfred Kahn also dismissed allegations that deregulation would lead the industry to engage

---

156. *Airline Group Expects Losses to Hit $6 Billion*, INT'L HERALD TRIB., May 31, 2005, *available at* http://www.iht.com/articles/2005/05/30/business/iata.php (last visited Mar. 4, 2008).

157. DEMPSEY & GESELL, *supra* note 4, at 262.

158. *See, e.g.*, Paul Stephen Dempsey, *Market Failure and Regulatory Failure as Catalysts for Political Change: The Choice Between Imperfect Regulation and Imperfect Competition*, 46 WASH. & LEE L. REV. 1, 15 (1989).

159. *See* PAUL DEMPSEY, ROBERT HARDAWAY & WILLIAM THOMS, 1 AVIATION LAW & REGULATION § 1.03 (1993).

160. *See* SUBCOMM. ON ADMINISTRATIVE PRACTICE AND PROCEDURE, 94TH CONG., REPORT ON CIVIL AERONAUTICS BOARD PRACTICES AND PROCEDURES 60, 61 (Comm. Print 1975).

in destructive competition, saying,

> [T]he assumption that you are going to get really intense, severe, cut throat competition just seems to me unrealistic when you are talking about a relatively small number of carriers who meet one another in one market after another. We don't find in American industry generally when you have a few relatively large carriers competing with one another that they engage in bitter and extended price wars.[161]

Kahn saw no differences between airlines and other major industries. As CAB Chairman, Kahn defied anyone to identify meaningful differences between airlines and grocery stores. But imagine a grocery store that had relentlessly high fixed costs, excessive capacity, and highly perishable inventory. A grocer who was selling a store full of commodities which had the spoilage properties of open jars of nonrefrigerated mayonnaise would have to have a fire sale every few hours to rid himself of unsold inventory, for it could not be warehoused and sold another day.[162]

Before deregulation, Kahn adamantly denied that deregulation would "depress profits, render the industry unable to raise capital, and so cause deterioration in the service it provides."[163] But, after only a decade of deregulation, Kahn would confess, "There is no denying that the profit record of the industry since 1978 has been dismal, that deregulation bears substantial responsibility, and that the proponents of deregulation did not anticipate such financial distress—either so intense or so long-continued."[164]

By the mid-1990s, some were alarmed by the fact that the industry had lost all the profits it had earned since the inauguration of commercial aviation in the 1920s.[165] With the benefit of a decade and a half of real world experience with deregulation, Kahn appeared to have changed his mind on the issue of whether the airline industry is subject to bouts of destructive competition. When asked about whether his vision of deregulation in the late 1970s included the steep financial nose

---

161. *Aviation Regulatory Reform: Hearing on H.R. 8813 Before the Subcomm. on Aviation of the H. Comm. on Public Works and Transportation*, 95th Cong. 178 (1977) (statement of Alfred Kahn, Chairman, Civil Aeronautics Board).

162. Paul Dempsey, *Running on Empty; Trucking Deregulation and Economic Theory*, 43 ADMIN. L. REV. 253, 306 (1991).

163. Kahn Address, *supra* note 107, at 39.

164. Alfred E. Kahn, *Airline Deregulation—A Mixed Bag, But a Clear Success Nevertheless*, 16 TRANSP. L.J. 229, 248 (1988).

165. Because the numbers were not adjusted for inflation, they overstated the magnitude of the financial collapse in relation to accumulated industry profit.

dive that resulted from it, Kahn replied, "No. I talked about the possibility that there might be really destructive competition, but I tended to dismiss it. And that certainly has been one of the unpleasant surprises of deregulation."[166]

One need only revisit Alfred Kahn's 1971 treatise on economic regulation to find a definition of an industry which exhibits the tendency to engage in destructive competition. Wrote Kahn:

> The major prerequisites [of destructive competition] are fixed or sunk costs that bulk large as a percentage of total cost; and long-sustained and recurrent periods of excess capacity. These two circumstances describe a condition in which marginal costs may for long periods of time be far below average costs. If in these circumstances the structure of the industry is unconcentrated—that is, its sellers are too small in relation to the total size of the market to perceive and to act on the basis of their joint interest in avoiding competition that drives price down to marginal cost—the possibility arises that the industry as a whole, or at least the majority of its firms, may find themselves operating at a loss for extended periods of time.[167]

Kahn described the post-deregulation airline industry almost perfectly. Fixed costs outweigh variable costs, by a margin of about four to one. The airline industry suffers from relentless excess capacity. On a national and long-haul basis, the industry is unconcentrated, leading to tremendous network competition for connecting traffic, often driving prices down to variable costs. Under deregulation, the airline industry has operated at a loss for extended periods of time.

Another individual who may have explained why competitors sometimes tend to engage in individually rational, but collectively irrational, behavior is Garrett Hardin, a student of population and environmental problems. In his powerful essay, *The Tragedy of the Commons*, Hardin wrote:

> Picture a pasture open to all. It is to be expected that each herdsman will try to keep as many cattle as possible on the commons. Such an arrangement may work reasonably satisfactorily for centuries because tribal wars, poaching, and disease keep the numbers of both man and beast well below the carrying capacity of the land. Finally, however,

166. Anthony Velocci, Jr., *Kahn Tells Airlines: Sit Tight, Cut Costs*, AVIATION WK. & SPACE TECH., Aug. 16, 1993, at 41.

167. ALFRED KAHN, ECONOMICS OF REGULATION 173 (1971).

> comes the day of reckoning, that is, the day when the long-desired goal of social stability becomes a reality. At this point, the inherent logic of the commons remorselessly generates tragedy.
>
> As a rational being, each herdsman seeks to maximize his gain. Explicitly or implicitly, more or less consciously, he asks, "What is the utility to me of adding one more animal to my herd?" This utility has one negative and one positive component.
>
> 1. The positive component is a function of the increment of one animal. Since the herdsman receives all the proceeds from the sale of the additional animal, the positive utility is nearly +1.
>
> 2. The negative component is a function of the additional overgrazing created by one more animal. Since, however, the effects of overgrazing are shared by all the herdsmen, the negative utility for any particular decision-making herdsman is only a fraction of 1.
>
> Adding together the component partial utilities, the rational herdsman concludes that the only sensible course for him to pursue is to add another animal to his herd. And another . . . . But this is the conclusion reached by each and every rational herdsman sharing a commons. Therein is the tragedy. Each man is locked into a system that compels him to increase his heard without limit—in a world that is limited. Ruin is the destination toward which all men rush, each pursuing his own best interest in a society that believes in freedoms of the commons. Freedoms in a commons brings ruin to all.[168]

Substitute airlines for herdsmen, aircraft for cattle, and the airways and airports for the commons and you can see how the airline industry propels itself toward destruction, particularly in markets in which consumers value frequency. Airlines have a tendency to "over graze" city-pair "fields" with an excessive number of aircraft feasting on a limited number of passengers.

It is the inability to capture the commons (for airlines: the airports and airways) through private ownership that creates a relentless tendency toward excessive consumption of its resources. Hardin points out that the tragedy of the commons can be avoided where private property rights exist. The problem is

---

168. Hardin, *supra* note 34, at 1244; *see also* LAURENCE E. GESELL, AIRLINE RE-REGULATION 126, 127 (1990).

dividing the skies into parcels of property.[169] Domestically, economic regulation attempted to parcel the commons into property rights by issuing certificates of public convenience and necessity to only that number of airlines the market could profitably support. In international markets, the bilateral air transport agreements historically have done that by limiting the number of entrants; capacity limitation agreements discipline firms from their primordial tendency to flood the market with excessive capacity; and price regulation attempts to restrain carriers from pricing below average fully allocated costs. Airlines operating in regulated international markets traditionally have enjoyed higher load factors and yields than in unregulated domestic markets, although consumers in most regulated international markets have been denied the opportunity to buy air travel below the cost of providing it.

Other economists have examined the airline industry and concluded that it does not fit the perfect competition model. As Robert Kuttner observed, airlines are "a highly capital-intensive industry with a standard product [which] cannot stand pure price competition—for all the profits would soon be competed away. Airlines dwell not in an Adam Smith world but in a world more reminiscent of economist Joseph Schumpeter's model in which 'efficiency' depends more on technical advances than on price wars."[170] Schumpeter was an Austrian-school lawyer/economist who argued that "perfect competition is not only impossible but inferior, and has no title to being set up as a model of ideal efficiency."[171] Professor Scherer concurs in Schumpeter's view that "perfect competition has no title to being established as the model of dynamic efficiency."[172]

Schumpeter believed productive efficiency was a superior measure of market performance than the perfect competition model, with its objective of creating allocative efficiency in terms of consumer welfare. According to Schumpeter, with sufficient profits, firms would be incentivized to create technological breakthroughs, and such technological advances are the driving force in spurring economic growth. With airlines in distress (and with the dominant hub-and-spoke route structure), the aircraft

169. *See* Paul Stephen Dempsey, *The Rise and Fall of the Civil Aeronautics Board: Opening Wide the Floodgates of Entry*, 9 TRANSP. L.J. 91 (1979).

170. Robert Kuttner, *Flying in the Face of Reason: Why the Skies Need Regulating*, BUS. WK., May 3, 1993, at 18.

171. JOSEPH SCHUMPETER, CAPITALISM, SOCIALISM AND DEMOCRACY 106 (1942); SCHERER, *supra* note 100, at 438.

172. SCHERER, *supra* note 100, at 438.

manufacturers have less ability to pursue the next generation of larger and faster aircraft.

But even among those who embrace allocative efficiency as the proper goal of a market economy, one finds serious doubt as to whether commercial aviation is able to achieve it. One school of economics, which suggests that the perfect competition/allocative efficiency model is inappropriate for aviation, centers around core theory. Core theory grew out of game theory, which uses formal mathematical models to evaluate different types of conflict between two categories: noncooperative (e.g., the prisoner's dilemma[173]), and cooperative.[174] The "core" is a key notion of cooperative game theory.[175] Cooperative game theory assumes that players communicate with each other, and are free to bargain or form coalitions with other players in order to maximize their personal benefit. A game has an empty core whenever each and every coalition can be outbid by a rival coalition. Games without a core lack the possibility of achieving a stable competitive equilibrium or a Pareto optimal result[176]—prices and output fluctuate incessantly.[177]

---

173. Attributed to Thomas Hobbes (1588–1679), the prisoner's dilemma considers two prisoners suspected of criminal complicity. They are confined in separate cells and cannot communicate. The prosecutor confronts each individually with the following proposal:

> Confess to the more serious charge and you will be treated leniently. Your partner in crime will be jailed for ten years, you for one. If you fail to confess but your partner does, the sentences will be reversed. Should both of you confess, each will be sentenced to five years. Yet should neither of you confess, evidence now suffices to convict both only on a lesser charge drawing three-year sentences each.

If both prisoners are rational and committed to minimizing their own sentences, each will reason thus: "I don't want to confess, but the other person might. If he confesses and I do not, I get ten years and he one. So, I should confess. For then, if he fails to confess, I get one year, and if we both confess, we each get five." So, if rational, both will confess. *See* DAVID THEO GOLDBERG, ETHICAL THEORY AND SOCIAL ISSUES 57 (2d ed. 1995).

174. *See* JOHN VON NEUMANN & OSKAR MORGENSTERN, THE THEORY OF GAMES AND ECONOMIC BEHAVIOR (1953).

175. For an application of game theory to the airline industry, see James Lanik, *Stopping the Tailspin: Use of Oligopolistic and Oligopsonistic Power to Produce Profits in the Airline Industry*, 22 TRANSP. L. J. 509 (1995).

176. Pareto optimality is a utilitarian function to satisfy a majority of the population. It differs from other utilitarian processes in that there are to be no losers when resources are distributed in a Pareto optimal fashion (i.e., anyone's gain cannot be to someone else's loss). When the distribution is "optimized," there is no way of making someone better off without making someone else worse off. Hence, in the airline scenario, Pareto optimalization occurs when just the right number of seats are sold in each of the seating classes—first, business, and coach. As a result, a first-class or business-class passenger, willing to pay extra, receives superior service, but not at the expense of coach passengers who, for whatever reason, do not pay the premium. Equity and efficiency, nor the relative value received, are not at issue. *See* JEFFRIE G. MURPHY & JULES L. COLEMAN, THE PHILOSOPHY OF LAW 212–18 (1984).

177. Abagail McWilliams, *Rethinking Horizontal Market Restrictions: In Defense of Cooperation in Empty Core Markets*, Q. REV. ECON. & BUS. 3 (1990); Lester G. Telser, *The*

University of Chicago economist Lester Telser has applied core theory to the airline industry, and found its core to be empty. He identified six characteristics of markets with empty cores:

- demand is uncertain or periodic;
- plant capacities are large relative to demand;
- plants have increasing returns of scale;
- plants have fixed, or rigid, capacity;
- there exist unavoidable fixed costs; and
- it is costly to store unsold inventory.[178]

As already observed above:

- demand for air travel is highly cyclical;
- airline capacity exceeds demand by a wide margin;
- airlines exhibit economies of scale, scope and density;
- aircraft have fixed capacity;
- airline fixed and sunk costs bulk disproportionately large vis-à-vis variable costs; and
- airline seat inventory is highly perishable and effectively cannot be warehoused.

Telser points out that the transportation industry is comprised of firms with fixed operating costs not dependent on the number of passengers but on the length of travel and size of the vehicle. According to Telser, "Fixed costs of an airline depend on the distance the plane goes, or whether it takes off or not, but they don't vary based on the number of passengers."[179] Because of the nature of the airline industry's cost functions, the market lacks a core.[180] In a chapter entitled "Sufficient Conditions for Natural Monopoly or Natural Monopsony," Telser observes, "The operating cost of an airplane depends primarily on its size and hardly at all on the number of passengers aboard." According to

Usefulness of Core Theory in Economics, 8 J. OF ECON. PERSP. 151, 155 (1994); John Shepard Wiley, Jr., *Antitrust and Core Theory*, 54 U. CHI. L. REV. 556, 585 (1987).

178. Summarized in McWilliams, *supra* note 177.

179. Timothy K. Smith, *Why Air Travel Doesn't Work*, FORTUNE, Apr. 3, 1995, at 45.

180. Lester G. Telser, *Competition and the Core*, 104 J. POL. ECON. 85, 106 (1996).

Telser, average cost in the transportation sector "is a decreasing function of output per plant."[181]

Professor Kenneth Button, who also has carefully investigated the airline industry's "empty core", observes that, "[W]hat is becoming apparent in the airline industry is whether the underlying market structure is intrinsically unstable, and whether government [antitrust] interventions are adding to any problems that already exist."[182] Economist William Sjostrom applied core theory to the transportation industry, focusing on ocean shipping. According to Sjostrom,

> An empty core arises whenever capacity, defined here as the output associated with minimum short-run average avoidable cost, in the industry exceeds the quantity demanded at the price equal to that minimum average cost . . . . [W]henever there is short-run excess capacity, there is unlikely to be a competitive equilibrium.[183]

The bottom line, according to Sjostrom, is that core theory "really amounts to saying that competition just isn't possible in some industries . . . ."[184]

According to economist Abagail McWilliams:

> The policy implications of the empty core theory are clear. It is unrealistic to expect firms to act like perfect competitors in markets where the underlying supply and demand conditions make such behavior disastrous. The issue, then, is not whether some means should be used to achieve a nonempty core. The issue is what form the fix-up will take and how much inefficiency consumers should have to support for the sake of competition."[185]

Telser concludes, "Eventually what happens is, the situation gets so bad that people realize that some very drastic reforms are necessary."[186] The drastic reforms that emerged in the 1930s from

---

181. LESTER G. TELSER, ECONOMIC THEORY AND THE CORE 45 (1978); *see also* Lester G. Telser, *Cooperation, Competition, and Efficiency*, 28 J.L. & ECON. 271, 276 (1985).

182. Kenneth Button, *How Stable Are Scheduled Air Transport Markets?*, *in* GLOBAL COMPETITION IN TRANSPORTATION MARKETS 29 (Adib Kanafani & Katsuhiko Kuroda eds., 2005); *see also* Kenneth Button, Empty Cores in Airline Markets, Address Before the Third Hamburg Aviation Conference, Hamburg, Germany (Feb. 14–15, 2002), *available at* http://www.hamburg-aviation-conference.de/pdf/session1/button.pdf.

183. William Sjostrom, *Antitrust Immunity for Shipping Conferences: An Empty Core Approach*, 8 ANTITRUST BULL. 19 (1993); *see also* William Sjostrom, *Collusion in Ocean Shipping: A Test of Monopoly and Empty Core Models*, 97 J. POL. ECON. 1160, 1161–62 (1989).

184. Smith, *supra* note 179, at 46.

185. McWilliams, *supra* note 177.

186. *Id*. A less pessimistic view is advanced by J.A. Donoghue, *Discovering the Center*, AIR TRANSP. WORLD, June, 1995, at 5.

what was perceived to be destructive competition in the airline industry was economic regulation of entry, pricing, and business practices. Telser suggests that longterm contracts or vertical integration might resolve the problem. According to Telser,

> [A] general method of resolving an empty core requires imposition of suitable upper bounds on the quantities that may be sold by certain sellers . . . . It may seem that a proposal for restricting output must be inefficient, since it has the character of a profit-maximizing cartel. However, in the situation where no core exists, such upper bounds can be efficient, if suitably chosen . . . .[187]

Finally, and succinctly, other economic characteristics of aviation require different types of governmental supervision. The airports themselves are natural monopoly bottlenecks (with declining costs over a large range of output), and are owned by local governments. Where they have been privatized, as in the United Kingdom, economic regulation has been imposed to prohibit monopolistic exploitation of tenants, for airports hold monopoly power over airlines. Externalities such as noise require environmental regulation, for without it, airlines would have little incentive to purchase quieter, but more expensive, aircraft. Safety regulation is mandated largely for social welfare reasons. While the tort litigation system motivates producers to higher levels of accident avoidance, it often works imperfectly. A firm close to bankruptcy, for example, might devote its limited resources keeping marginal aircraft aloft, rather than maintaining aircraft at the levels demanded for a near-zero accident objective.

IV. CONCLUSION

Paradoxically, although airlines are perceived to have been deregulated, they are, in fact, highly regulated. The financially beneficial aspects of regulation—pricing, entry, and the ability to engage in antitrust-free domestic intercarrier agreements—were abolished in 1978. But the financially corrosive aspects of airline regulation were left in place. The result since 1978 has been higher volatility, deeper troughs in the market cycle, prolonged losses, and widespread bankruptcies. Perhaps now, the airline industry reflects Professor Kahn's definition of "destructive competition," Professor Telser's definition of an "empty core," or Professor Hardin's description of the "Tragedy of the Commons."

187. Telser, *supra* note 177, at 159.

Finally, although deregulation has often been credited with producing billions of dollars of consumer savings, it rarely takes the blame for billions of dollars in airline financial losses. Moreover, the notion that consumers have saved billions of dollars as a result of deregulation is an urban myth. Real yields for passengers were falling at an annual rate of 2.3% before deregulation, and only 1.4% after deregulation.[188] Industry net profit margins averaged 2.8% before deregulation, and fell to a –0.6% under deregulation.[189] Profitability and returns on investment have become both more volatile, and significantly worse, since deregulation.[190] The airline industry is one of the few industries in history to have lost all its accumulated profit.[191] Half the fleet capacity of the nation's airlines collapsed into Chapter 11 bankruptcy. By any measure, the financial performance of the airline industry under deregulation has been unsatisfactory. It was so before deregulation, and it has been profoundly so since.

In recent decades, deregulation has touched a number of infrastructure industries—particularly transportation, communications, energy, and financial—some with catastrophic results, leading to major taxpayer bailouts. In various periods of American history, regulation has been interjected into the economy to correct for market failure, and at others, deregulation has been introduced to correct for regulatory failure.[192] Each generation must decide for itself what the relationship of government and the market shall be. It should study the empirical results of its public policy changes carefully, so that when public sentiment shifts, it can better calibrate the government's role in the market. America needs a strong infrastructure to support growth in the other sectors of the economy that rely upon it.

188. *See supra* fig.1.

189. *See supra* fig.2.

190. *See supra* fig.1.

191. *See supra* fig.1.

192. Paul Stephen Dempsey, *Market Failure and Regulatory Failure as Catalysts for Political Change: The Choice Between Imperfect Regulation and Imperfect Competition*, 46 WASH. & LEE L. REV. 1 (1988).