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A Two Part Analysis of the Current State of the U. S. Airline Industry

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A Two Part Analysis of the Current State of the
U.S. Airline Industry

A THESIS
The Honors Program
College of St. Benedict/St. John's University

In Partial Fulfillment of the
Requirements for the Distinction "All College Honors"
In the Department of Economics

by
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May, 1993

A Two Part Analysis of the Current State of the U.S.
Airline Industry

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I. Part One

Introduction

In 1978 the United States airline industry was released from government regulation, the first of the regulated industries to be deregulated. 1993 marks the fifteenth year of airline deregulation. Throughout these years there has been an on-going controversy as to whether or not deregulation was good for the consumers and airlines of America. America's consumers have survived deregulation, but many of its airlines have not. Cyrus Smith once said upon leaving his position as president at American Airlines that "These days no one can make any money in the goddamned airline business. The economics represent sheer hell" (Sampson 1).

Perhaps Smith was correct. Today many old and respected corporate names in air travel have either vanished from public sight or are near disappearance. Names like Pan Am, Eastern and Braniff are forever gone. Others, like TWA and Continental, are languishing in bankruptcy. Meanwhile, a few strong survivors, such as American, United and Delta are scavenging through the ruins of the defunct airlines, picking up the most valuable pieces and becoming bigger and bigger so that they may muscle out the few surviving weaker and smaller carriers. Even before deregulation the smaller airlines feared that the larger carriers could or would use

their superior financial strength to push them out of the market.

America's airways have become a battle zone, a place where the strong survive and the weak perish. This is what is expected of a free market open to competition. There should exist a weeding out period to remove the weak, inefficient carriers. The irony of airline deregulation is that fifteen years after its passage into law, most of the surviving carriers are badly hemorrhaging cash. For example, in 1991, American Airlines lost \$240 million and United lost \$331 million (Fortune 93). In 1990 alone the U.S. airline industry lost \$4 billion (AirTransport 1991, 3). Delta airlines, traditionally one of the strongest carriers lost \$324.4 million in 1991 (Fortune 93). Not to be out done, American and United each lost over \$200 million that same year (Fortune 93). All three of these airlines have generally been consistent profit earners in the past. According to the Airline Transport Association of America (ATA), 1990 was the worst business year ever for America's airlines, even though the airlines set new records in the number of passengers and amount of cargo carried. Could it be that deregulation has left the airlines more susceptible to changes in the economy, or perhaps the industry is just going through a maturing process?

With the current financial instability and rapid consolidation of the industry today, this paper proposes to

examine two possible explanations for this state of the industry today. Has deregulation made America's airlines more vulnerable to the business cycle than they were under regulation, resulting in the incredible losses we are seeing today, or has a natural evolution of the industry, following the life cycle model, been the cause behind the recently negative profits, bankruptcy and demise of firms, and increased market share of a few airlines? All dollar values in this paper will be presented in 1982 constant dollars.

These are the issues that will be examined in two parts. Part one examines the history of airline regulation and the problems associated with it. Then deregulation will be briefly explained. Finally, part one will discuss the performance of the airlines before and during the recessions of 1969-1970 and 1973-1975, when the industry was regulated. It will be compared and contrasted to their performance before and during the recessions of 1980-1982 and 1990-1991, when the industry was operating under deregulation. This will determine if deregulation has made them more vulnerable to the changes in the economy.

Part two covers the industry life cycle model. The concept of the model is explained and then the model itself is applied to the industry. Here different aspects of the industry, such as market growth, competition and profits, are applied against the theoretical results of the model to

determine where the industry currently stands in its life cycle.

Regulation

The fledgling airline industry was subsidized by the U.S. government to encourage its development. Subsidies were given to the young airlines in the form of mail contracts. Until 1925 the commercial air transport industry in the United States was virtually nonexistent. That year Congress passed the Air Mail Act of 1925 which created the federal air mail contract program for private firms. Up to the mid 1930's passenger traffic was practically nil and the airlines depended heavily on revenues from air mail contracts. Consequently, the contracts acted as a form of subsidy provided by the federal government to the industry. The contracts were designed to be lightly based on costs and usually exceeded costs. Therefore, carriers received a generous surplus in revenues from the mail contracts which subsidized the growth of passenger service. Unfortunately, this resulted in a great scandal, involving the manner in which the U.S. Postal Service awarded the contracts. The scandal forced Congress to transfer the subsidy authority to the Interstate Commerce Commission(ICC).

The ICC also could not administer the subsidy granting authority in a fair manner, since there was room to cheat in the process. The agency awarded the mail contracts through a bidding process, and whichever airline bid the lowest price won the contract. The only setback to this system was that the airlines knew the government would raise the

subsidy to the selected carrier if the initial reward proved to be insufficient to cover costs incurred in providing the service. Effectively, carriers had the incentive to bid a zero price in order to win the contract. This was demonstrated by Braniff losing the bid to carry mail between Houston and San Antonio with a bid of \$0.00001907378 per airplane mile to Eastern with a bid of zero cents per airplane mile (Caves 124).

This process was viewed as allowing excessive competition by permitting the airlines to submit under cost bids. They could win a route with an artificially low bid, even if it cost them more to operate the route than those who bid against them, since the government would raise the subsidy if their bid proved to be too low. By winning the awards the airlines could expand their route systems with the government paying for it. This gave the airlines the ability to expand their systems even if they were not the lowest cost supplier. Consequently, the only way the government could minimize the subsidy payments required was through regulation. In 1938 the United States airline industry was regulated under the Civil Aeronautics Act of 1938. This imposed government regulations on airline fares and entry and exit into the market.

Not only did the government use the abuse of subsidies as a reason for regulation, but also advocated it on the grounds that regulation would prevent unwarranted high

airfares and excessive competition, and would encourage the flow of investment into the developing industry. Investment in airlines was a risky business before regulation in 1938, since the business was financially unstable. The industry's terrible financial condition was the result of the airlines' tendency to engage in what has come to be regarded as "destructive competition" (Caves 124). Proof of this tendency can best be illustrated by the Braniff and Eastern bidding example already explained. Consequently, few investors invested in the airlines and the funds to encourage capital improvements and technological advances were virtually non-existent during the late 1920's and early 1930's.

Even though the industry did experience growth by the mid 1930's, when revenues grew almost 75 percent, between 1935 and 1938 it continued to incur losses. Expenses still exceeded costs: the industry lost \$29.4 million in 1935, \$6.6 million in 1936, \$1.3 million in 1937, and \$13.4 million in 1938 (Wilson 62). The president of the Air Transport Association testified before a congressional hearing in 1938, that of the \$1 billion in private funds that had been invested in the industry, half of that, \$500 million had already been lost. The financial position of the industry only continued to worsen as 1940 approached. Consequently, through regulation the government could help

provide the financial stability needed to attract investment.

With the passage of the Civil Aeronautics Act of 1938 came the establishment of the Civil Aeronautics Board (CAB). The CAB was the regulatory agency for the airline industry, replacing the ICC. This five-man board was responsible for overseeing the economic conduct of the nation's airlines. The decisions passed by the board were to follow set guidelines which included the following four provisions:
lines which included the following for provisions:

- a) The encouragement and development of an air-transportation system properly adapted to the present and future needs of...the United States.
- b) The regulation of air transportation. . .as to recognize and preserve the inherent advantages of . . . and foster sound economic conditions in, such transportation.
- c) The promotion of adequate, economical and efficient service by air carriers.
- d) Competition to the extent necessary to assure the sound development of an air-transportation system properly adapted to the needs of the. . .United States.

(Caves 126)

The interesting guidelines are provisions b, c and d.

All three deal with the economic health of the industry. It appears that the guidelines of the CAB were designed in such a manner as to assure profitable operations of the airlines under regulation by controlling competition and all other aspects of the market.

Problems with Regulation

When an industry receives a subsidy, such as the airlines with mail contracts, the result is usually higher-than-normal profits and the use of excessive resources, according to economic theory. There are some disputes about whether or not this was true for the airlines. Caves says that profits in the air-transport industry have not been more than normal (Caves 253). Yet Teal states that the industry enjoyed "unprecedented profits in the mid 1950's" (Teal 53). It may very well be that the post war years of the 1950's were a period of exceptional growth for the industry. Subsidies were not the only problem with regulation. There also existed seller concentration, barriers to entry and control of competition.

As the industry was being regulated in 1938, nineteen carriers were given certificates for domestic service (Caves 13). By the 1960's only one small shuttle operation had exited the market, while six other small and financially weak carriers either merged or were taken over by other airlines (Caves 13). The incentive to merge with a weak carrier resulted from the CAB's policy of not allowing the airlines to sell route authority and usually not allowing them to trade them either. Route authority is an airlines permission, granted by the CAB, to fly between two or more cities. Since the CAB had restrictive entry policies at the route level, an airline could quickly expand its route

network through a merger with another airline. Many weak carriers about to go out of business received generous merger offers, usually greater than the airline's asset value.

Furthermore, banks readily lent money to financially unsound carriers, since they knew that they, the banks, were protected against default on the loan by the fact that another carrier would most likely merge with the failing airline. Before deregulation not a single airline holding authority to provide scheduled service went bankrupt. The CAB controlled not only entry but also exit from the industry. Because of this an airline would have to receive CAB approval before exiting any or all of its routes. The Board even gave financially struggling carriers preferential treatment in route proceedings in order to help increase their profits. Thus under regulation the CAB provided incentives for firms to operate in an inefficient manner since a financially weak carrier was likely to receive special treatment from the CAB in order to increase its profits.

The Civil Aeronautics Board never admitted an airline to the industry with full national airline status, that is one with long haul routes crossing the country. A potentially new airline could only offer promises of quality service and low fares compared to the proven record of an established airline, with an extensive route network that

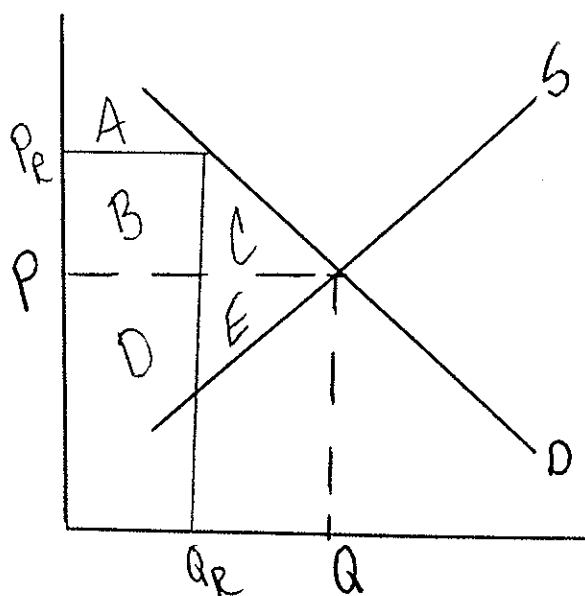
provided numerous connecting possibilities. This gave the existing airline a great advantage in presenting its case for a new route before the CAB. The advantage was so strong that the Board rejected numerous applications to start new airlines over the years. This meant the Board itself created barriers to entry. It tried to protect the financial stability of the industry by preventing new entry and fare reductions whenever there appeared to be a sizable threat to an incumbent airline's profits. Therefore, many airlines enjoyed monopoly routes. For example, CAB-protected monopoly routes allowed Delta Airlines to achieve the highest rate of return in the industry.

Furthermore, the CAB controlled forms of competition. The agency disliked price competition in any form and viewed it as too much competition. Therefore, carriers had to compete with the quality of service offered. This too was controlled by the CAB. For example, in 1956 TWA attempted to make up for its slower aircraft on transcontinental routes by offering the "Siesta Sleeper Seat" in first class. This seat would nearly flatten out for sleeping. TWA felt that competition justified its change in first class. Yet upon hearing this, American and United threatened retaliation by adding the same seats to their faster fleets. The Board ruled in favor of American and United, claiming that installation of the larger seats would reduce the available number of seats per plane. Consequently, if all

transcontinental airlines made the switch, profits would substantially decline (Cave 235). This demonstrates the CAB's attempts at managing airline profits by stifling innovative ideas coming out of nonprice competition. In effect the Board attempted to keep airline profits from eroding due to any type of competition. Furthermore, the CAB did not advocate or permit fare reductions unless all the airlines were prospering and could easily withstand greater price competition (Caves 125).

Finally, regulation itself was inefficient. (See Fig. 1, p.16). Using the assumption that the industry is perfectly competitive in an unregulated market, the airlines would reach equilibrium at price P and quantity Q , with total benefits to society equaling areas $A+B+C+D+E$. When the industry is regulated by an agency such as the CAB, and quantity, price and competition are restricted. The regulated quantity is Q_R at price P_R . Consequently, the benefits to society are reduced to the area $A+B+D$. The result of regulation is a loss of total benefits to society of area $C+E$. This loss represents inefficiencies in a regulated market. Thus the airlines were making profits with help from the CAB, but operating under an inefficient system. Yet it must be kept in mind that deregulation does not necessarily guarantee a perfectly competitive market, where the industry would move to P and Q . They may come close to P and Q , but not reach that point.

Fig. 1.



Furthermore, in a non-competitive market, external forces such as potential entry of new firms, stockholder revolt, or bankruptcy do not require firms to act efficiently. Regulation insulates firms from the forces of a competitive industry which cause firms in unregulated markets to operate efficiently. For example, in a competitive industry a firm which can reduce its costs can increase its profits while using its cost advantage to expand. Under regulation there existed little incentive to reduce costs since an airline could not use its cost advantage to expand its market share and production. Since efficient carriers could not cut fares or expand, because the CAB controlled what prices they charged and which routes they flew, inefficient carriers were protected. Consequently, the CAB basically eliminated the risk of financial ruin for inefficient airlines, which might have

been very prevalent in an unregulated environment, if the industry was perfectly competitive.

The inefficiencies which existed in the industry can best be illustrated by a study conducted by Douglas and Smith between the years 1965 to 1974 (See Table 1, p.18, Pustay). With 1.0 representing a performance at the industry average, it can be seen that the three largest airlines, American, Eastern and TWA, all performed below the industry average during the years of the study. Since the three largest airlines were operating less efficiently than the other smaller airlines in the market, it may very well prove that regulation lacked the adequate incentives and external pressures to cause firms to operate efficiently.

In an unregulated industry market forces tend to make firms perform efficiently as a condition of survival. Regulation, on the other hand, may protect a firm from many of the outside forces, such as entry of new firms, bankruptcy or stockholder revolt, that would cause an unregulated firm to act efficiently. Even though any cost reductions by a regulated carrier would still result in an increase in profits, the regulated carriers are spared from the "stick (threat of bankruptcy, takeover) that disciplines unregulated firms to produce efficiently" (Pustay 50). Thus the study further reinforces the notion that regulation insulated the airlines from operating efficiently. Furthermore, since the CAB controlled the prices the

airlines charged, the carriers had incentives to engage in inefficient nonprice competition by scheduling more flights on a route for convenience, roomier seats, free drinks, piano bars, designer painted planes and movies.

Table 1.

AGGREGATE EFFICIENCY INDICES DOMESTIC TRUNK AIRLINES, 1965-74										
	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
American	0.950	0.978	0.950	0.959	0.968	0.975	0.968	0.963	0.946	0.958
Eastern	0.963	0.913	0.919	0.913	0.945	1.004	0.972	0.965	0.928	0.930
TWA	0.972	0.970	0.980	0.961	0.959	0.947	0.951	0.999	0.954	0.947
United	0.991	0.937	0.973	0.986	0.986	1.004	0.992	1.012	1.054	1.025
Braniff	1.058	1.099	0.973	0.984	1.025	1.054	1.053	1.059	1.051	1.089
Continental ^c	1.329	1.523	1.486	1.318	1.271	1.185	1.130	1.107	1.053	1.084
Delta	1.104	1.149	1.095	1.110	1.111	1.132	1.091	1.080	1.057	1.058
National	1.112	1.102	1.080	1.090	1.044	0.857*	1.022	1.026	1.033	0.918*
Northeast*	0.933	0.954	0.890	0.969	0.861	0.970	0.916	0.942	—	—
Northwest	1.248	1.322	1.337	1.210	1.172	0.994*	1.094	1.006*	1.133	1.155
Western	1.061	1.078	1.079	1.044	0.953	1.059	1.005	1.022	1.053	1.051

* Carrier struck for longer than 90 days in the year.

† Northeast merged with Delta in 1973.

‡ Continental's indices before 1970 are not strictly comparable to the indices of the other carriers because of its extensive transpacific charter operations from 1965 to 1969.

N.B. Aggregate Efficiency Index = $0.2430 E_1 + 0.2483 E_2 + 0.4087 E_3$.

Sources of cost and output data: US Civil Aeronautics Board, *Aircraft Operating Cost and Performance Reports* and *Handbook of Airline Statistics*, various issues.

Thus regulation insulated the airlines from the effects of a competitive market. The CAB controlled the number of firms in the industry, entry and exit of firms, price and quality of service offered. This explains why no airlines went bankrupt (Brenner 7) and why the industry suffered no substantial losses during regulation (See table 2, p.19); only after deregulation do significant losses become evident.

Table 2 shows that the airlines consistently had a positive operating profit margin, as a percent of operating revenue, the years prior to deregulation, but even then they fell below the CAB's profit targets of 10.5 percent for the

1960's and 12 percent for the 1970's (Bailey 26). This again is another example of the CAB's attempts at providing the industry with continuous profits through regulation. Yet, the airlines could not meet its expectations even

Table 2.

<u>Airline Industry</u>		<u>Industry Profitability</u>	
Years	Profit Margin on Operations (in percent)	Rate of return on stockholder's equity (in percent)	
1967	9.3	13.3	
1968	6.4	6.3	
1969	5.6	4.7	
1970	.3	-4.5	
1971	3.4	1.6	
1972	5.8	6.6	
1973	4.9	5.0	
1974	6.5	10.5	
1975	.8	-2.1	
1976	4.0	8.5	
1977	3.8	11.2	
1978	5.5	17.7	
<u>Post Deregulation:</u>			
1979	-0.4	3.4	
1980	-1.1	4.2	
1981	-2.2	-3.7	
1982	-4.0	-15.8	
1983	-1.7	-7.8	
1984	4.9	9.9	
1985	3.1	9.6	
1986	2.6	4.9	
1987	4.3	7.2	
1988	5.4	10.8	
1989	2.6	6.3	
1990	-2.5	-6.0	

Source: Bailey 25.

though the CAB focused the formulation of most of its policies on the financial health of the industry. The first few years after deregulation they record consistent losses, especially through the years 1979 to 1983. During these years the CAB no longer regulated the airlines and set profit targets. It may well be that the immediate losses after deregulation are a sign that inefficient carriers were able to operate profitably under regulation, since under regulation the carriers recorded no losses. This performance may be due to the fact that the industry was going through a period of transition to an unregulated market. Yet, after a few years of prosperity, basically 1984 through 1989, the industry in 1990 again recorded a loss. It is not surprising that these periods of loss are also periods of economic recession for the economy.

Also during these post deregulation periods the rate of return on stockholder's equity is negative, while for all manufacturing in general the numbers are positive. In addition, during regulation negative returns on stockholder's equity for the airlines were significantly less than after deregulation. As can be seen in Table 2, the losses to stockholders in 1970 and 1975, the only two negative years on the table, are relatively small, only -4.5 percent and -2.1 percent respectively. Meanwhile, the losses to stockholders after deregulation are much greater. In 1982 the loss was -15.3 percent, in 1983 it was -7.8

percent and in 1990 it was -6.0 percent. This further illustrates the airlines poor performance during recessionary periods after deregulation.

Deregulation

Since the industry was no longer in its infancy, reform was called for in the 1970's. Another factor leading to airline deregulation was the experience of the intrastate carriers, who were exempt from CAB authority. These airlines demonstrated that by offering low fares they could successfully generate increases in traffic between city pairs. Thus by the mid 1970's economists had presented information that revealed regulation was unneeded.

Then during the years of President Jimmy Carter, Alfred Kahn was appointed chairman of the CAB. Kahn was a staunch proponent of airline deregulation, and he tried to ease the control the Board had over the airlines. Furthermore, Congress was working on a bill to deregulate the industry and on Oct. 28, 1978 President Carter signed the Airline Deregulation Act into law (Bailey 34). This act proposed a slow relaxation of the CAB's control of the industry over a four year period, ending with the termination of the Board. The airlines were now free to operate in an unregulated market. The implications for the major airlines were enormous. Gone were the days of CAB protection.

Even though "profit margins from 1967-1977 averaged only 1.7 percent for airlines versus 4.8 percent for U.S. manufacturing companies" (Brenner 8) the majority of airlines did not want deregulation. After all, deregulation allowed entry of competitors into the existing airlines'

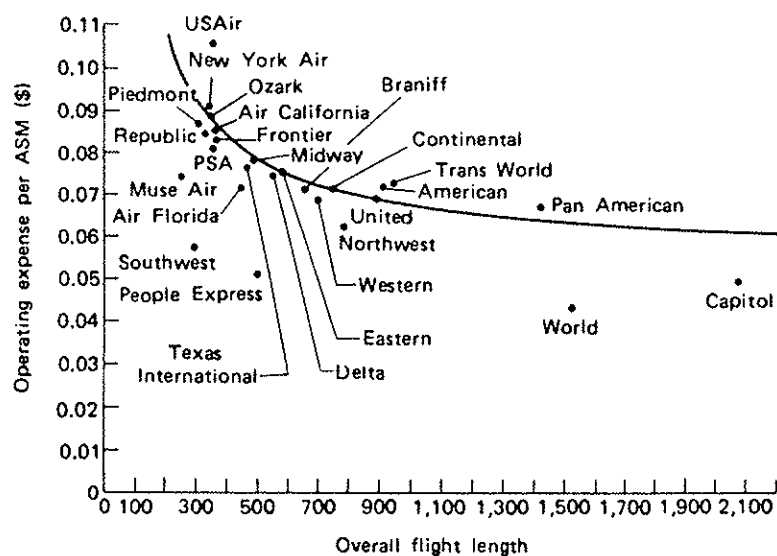
most profitable routes. Airlines like American, Eastern and TWA vehemently opposed regulation since they were in weak financial positions. This adds another piece of evidence to the idea that regulation had insulated the airlines from the effects of the economy.

Deregulation was considered to be positive for the consumer, since competition would theoretically bring about lower fares, new types of service and greater efficiency in the industry. This it did do in the short run. New airlines, such as New York Air, People Express and Midway entered the market offering low airfares. For example, People Express offered a \$35 fare between Buffalo and Newark, which was quickly matched by the dominant carrier in the market, USAir (Bailey 106). This caused the dominant airlines to begin to practice predatory pricing to drive out competitors and gain market share. Today there are very few of the upstart airlines from the 1980's, offering low fares to the consumer. The price wars may also be a reason for profit declines in the recessions after deregulation. During regulation they could easily ask the CAB for fare increases to cover any losses due to an economic slowdown. Today they cannot.

Cut-throat competition is something the airlines were not use to before deregulation. As can be seen from figure 2 p.25, even after deregulation there still exists economies of scale 'as related to distance flown. Figure 2 shows that

the airlines with flights of shorter distances have higher costs

Figure 2.



Source: Bailey 92, 1982.

per available seat mile flown (ASM). Cost per ASM is what it costs an airline to fly one seat one mile. Therefore, airlines with short distance route systems are at an even worse disadvantage to compete with discount fares than the airlines involved in long haul service. This has an even worse implication since the demand for air travel is price and income elastic. Consequently, the airlines must offer discount fares to encourage traffic during recessionary periods.

Demand for Airplane Seats

The airlines sell perishable goods. Once the plane leaves the ground with an empty seat, the revenue that could have been earned from putting a paying passenger in the seat is lost. This perishable commodity is also very income elastic. As a person's income changes the quantity of airline seats they demand will change at a greater percentage than their income.

The demand for seats is procyclical, meaning that when the economy is in good shape, people tend to have greater incomes and therefore demand a great quantity of airplane seats. Conversely, as the economy turns down and people's incomes do too, people tend to greatly curtail the number of seats they demand. The demand for air travel changes with the performance of the economy.

Deregulation was pursued at a time of general economic expansion of the nation's economy. Between the years 1975 and 1978, the upturn in the economy caused quite an increase in the demand for air travel, causing improved financial health of the industry. Consequently, even the weakest carriers under regulation were able to prosper initially under deregulation. "The demand for air travel is positively related to the growth of the economy" (MacAvoy 182). Therefore, deregulation appeared desirable at the time of its creation, since the country was experiencing a period of sustained economic growth.

Not only is demand for airline seats income elastic, but it is also price sensitive, suggesting that at lower prices people demand even more air travel. Most studies have concluded that the demand for air travel is elastic and the CAB came up with the elasticity of demand for air travel approximately equaling -1.3 (MacAvoy 188).

MacAvoy conducted a study whereby he calculated the change in industry profits according to different price elasticities of demand if a 16 percent fare decrease were to take effect. (See Table 3, p.28). As can be seen from the table the more price sensitive the demand for air travel is, the greater positive impact a decrease in fares will have on the industry profits. At a demand elasticity of -2.5 the industry would experience an increase of profits of positive \$1.1 billion with a 16 percent decrease in fares, this is if the economy was not in a recession. According to Bailey, a prolonged economic slump or rapid cost increases would depress traffic and profitability. Caves states that individuals in high income groups are usually more likely in any year to take a trip (Caves 39). Yet, during an economic recession people look for ways to scale back their expenses, so those individuals who would normally travel will not unless the price is low enough to make it worthwhile for them to spend the money. Even business travelers, who have been considered traditionally to possess very low price sensitivities since their business must depend on travel,

now look for travel substitutes such as teleconference calls and fax machines.

**SENSITIVITY OF SHORT-RUN INDUSTRY PROFITS
TO DEMAND ELASTICITY**

(assuming sudden, complete deregulation; 16 percent fare decrease;
\$10 billion total industry revenue and cost)

Table 3.

Demand Elasticity Assumption	Change in (Short-Run) Industry Profit Rate (millions of dollars per year)	Change in (Short-Run) Industry Profit Rate as Percentage of Initial Industry Total Revenue and Cost
$e_d = -.7$	-660	-6.6
$e_d = -1.0$	-352	-3.5
$e_d = -1.3$	-44	-0.4
$e_d = -2.0$	+675	+6.8
$e_d = -2.5$	+1,189	+11.9

Prior to 1978, the substitutes for air travel were relatively limited, especially for long distances. The airlines could then ask the CAB for fare increases which would then be implemented in the price least elastic markets in order to cover the losses incurred by the recession. Under deregulation, technological advancements have given rise to more substitutes for travel, consequently carriers have a harder time trying to raise fares in the least elastic markets to cover losses. Furthermore, with free pricing in the market, any fare increases could be under cut by a rival carrier.

Performance of the Airlines during Specific Recessionary
Periods under Regulation and Deregulation

It is helpful to examine the airlines performance during select recessionary periods during regulation and after it, in order to see if the business cycle had an effect on their profits and the number of people traveling. I chose the recession years during regulation of 1969-1970 and 1973-1975 to compare to the deregulation recession years of 1990-1991 and 1980-1982. The recession of 1969-1970 and 1990-1991 were matched up because they are of comparable length. Consequently, the recession of 1973-1975 matched up with the recession of 1980-1982 for the same reason. By matching up these regulated recessionary periods with the unregulated recessionary periods, I will demonstrate that the airlines performed worse in unregulated periods than in regulated periods.

During the years 1969-1970 real GNP dropped about 4 percent each quarter, indicating a recession. During this time the airlines were regulated. As shown in Table 4, p.31, in 1969 the industry had a net profit \$132.4 million, while in 1970 the industry incurred a net loss of \$476.2 million. At the same time passengers enplaned dropped from 171.8 million in 1969 to 169.9 million in 1970 (Air Transport Association), as shown in Table 5, p.32.

Compare those numbers to the 1990-1991 recession. Here in 1990 the industry had a \$2.9 billion dollar loss compared

to the \$132.4 million gain in 1970. In 1991 the industry lost \$2.6 billion dollars compared to the loss of \$476.2 million. The difference between these two losses is quite great. Total passengers enplaned increased from 453 million in 1989 to 465 million in 1990. This is a 2 percent increase from the year before. Compare that to a decline in passengers enplaned for the 1969-1970 recession. There seems to be a problem with this scenario. How could an industry lose money when more consumers are buying more of its product? Perhaps the answer is lower fares, meaning more passengers but less revenue.

During the recession of 1973-1975 industry profits went from \$457.8 million in 1973 to a net loss of \$141.9 million in 1975. Compare this to the results during the 1980-1982 recession. Net profits were a net loss of \$258.5 million in 1980 to another loss of \$733.4 million in 1982, with a loss in 1981 as well. The industry had net losses both at the beginning and end of the recession compared to net losses only at the end of the two recessions during regulation. Furthermore, passengers enplaned dropped from 296 million in 1980 to 294 million in 1985. The number of passengers enplaned from 1973 to 1974 actually increased from 202.2 million in 1973 to 207.4 million in 1974.

Table 4.

Profit/Loss for the Airline Industry
for various Recession Years in 1982 dollars

<u>Recession Year</u>	<u>Profit/Loss</u>
1969	\$132.4 million
1970	-\$476.2 million
1990	-\$2900 million
1991	-\$2640 million
<hr/>	
1973	\$457.8 million
1974	\$595.6 million
1975	-\$141.9 million
1980	-\$258.5 million
1981	-\$320.0 million
1982	-\$733.4 million

Source: Air Transport Association of America, various
years.

Table 5.

Passenger Enplanements for the Airline Industry
for various Recession Years

<u>Recession Year</u>	<u>Revenue Passengers Enplaned</u>
1969	171.9 million
1970	169.2 million
1990	465.5 million
1991	318.6 million
<hr/>	
1973	202.2 million
1974	207.4 million
1975	205.0 million
1980	296.9 million
1981	285.9 million
1982	294.1 million

Source: Air Transport Association of America, various years.

Profit margins lend further support to the concept that deregulation has left the airlines more vulnerable to the business cycle. Since 1978 the profit margin on operating revenue of the industry has declined (See Table 2, p.20). One reason for the slump in the industry after 1978 may have been the rapid rise in fuel prices during the recession of 1980-1982. Yet if this were true there should also have been a decline in profit margins during the 1973 oil shock. This did not occur (see table 2, p.20). Profit margins for the major trunk airlines such as American, United, Northwest and Delta increased from 4.9% in 1973 to 6.5% in 1974 (Bailey, Appendix 208-210). Furthermore, the locals, such as North Central, Ozark and Frontier, increased from 6.0% to 7.7% in the same period (Bailey, Appendix 208-210). During deregulation, the profit margin for the major trunk airlines in 1980 was -1.1% of operating revenue, with a further decline in 1981 to -2.2%. Therefore deregulation left the airlines more vulnerable to shifts in the economy than they were under regulation. Braniff Airlines lends further support to this statement since the airline went bankrupt in 1982, the first major airline ever to do so, since before regulation in 1938.

Further evidence of regulation protecting the airlines from fuel price increases is shown in the following example. Aviation fuel rose from 22.5 cents per gallon in 1974 to 27.2 cents per gallon a year later in 1975 (MacAvoy 182).

In 1977 fuel accounted for 20 percent of the major airlines average operating expenses. The Federal Energy Administration predicted that by the end of 1977 the price of aviation fuel would rise another three cents per gallon. Such a price increase would raise the airlines' cost level by 2.2 percent. This would make fuel expense almost 21.7 percent of total costs. This increase in costs would represent a profit reduction of \$220 million annually (MacAvoy 182).

Under regulation there were two ways in which the airlines could respond to such a change. First, they could slow the rate of capacity expansion, until demand caught up to the higher break even load factor. With higher costs the airlines would need a higher load factor, or percentage of total seats filled by paying passengers, to cover the higher cost of transporting the passengers. Secondly, they could increase fares with the approval of the CAB. If the latter response were chosen, each airline could raise its fares in individual markets a proper amount in order to cover the increased costs brought about by the higher fuel price. Therefore, the burden of lost profits shouldered by the airlines would be far less than the \$220 million mentioned earlier.

Under deregulation the airlines really have no way to respond to such fuel increases except to lower other costs. If any airline tried to raise fares, some other carrier

could undercut the fare and steal market share away from the other carrier. This is fine if the economy is in good shape and there is plenty of air travel demand, but if the economy should go into a recession, the airline may lose its share of an ever decreasing number of passengers. Airlines must offer very low fares, sometimes even below cost to stimulate travel. The net result has been greater losses for the industry in times of recessions during deregulation than under regulation, since the airlines are now open to price competition, while selling a commodity which is price and income elastic.

Conclusion to Business Cycle Explanation

The previous six sections have demonstrated that the airlines are more vulnerable to the effects of the business cycle now that they have been deregulated. Since the United States has just recently gone through a recession this may very well be the reason why the airlines are in a bad financial position today. They sell an income elastic and price sensitive commodity. Therefore, as people's incomes change they demand an even greater or lessor amount of air travel. Also, as the price of an airplane ticket changes people will demand more or less tickets. This is all connected to the performance of the economy.

Under regulation, even during recessions the airlines rarely encountered operating losses or bankruptcy. When people demanded less air travel as incomes declined, the airlines could raise fares and make up the difference with those who could afford to continue traveling at the higher fares. This allowed them to experience either small losses or low profits. Since the CAB regulated fares in the market the carriers did not have to worry about price competition. Furthermore, they competed with fewer carriers on their routes, since the CAB strictly controlled the number of carriers competing between to cities.

Under deregulation price competition becomes relevant, since now the carriers can charge what ever price they want on their routes. Consequently, if one airline is losing

money during a recession and wants to raise its fare on a route, it will have difficulty doing so, since its competitors can now move into that route at will and charge a lower fare. This means the airline will lose market share if it tries to raise its fare.

As was shown with the airlines performance during recessions under regulation and deregulation, the airlines tended to fare better as far as profits are concerned during recessions under regulation. Therefore, deregulation has definitely left them more vulnerable to the business cycle. This may explain why the airlines are losing so much money today, since our economy has just gone through a recession. Yet there may be more than one explanation for the current state of America's airlines. One of these other explanations is covered in the following sections.

II. Part Two

Industry Life Cycle

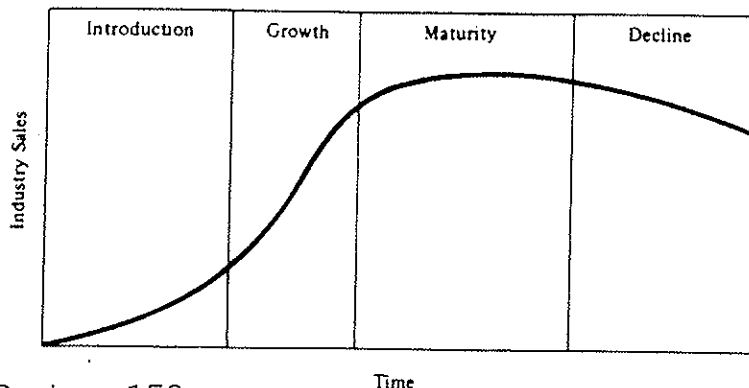
A second explanation for the horrendous state of the airline industry today may be the concept of industry evolution. It must be clarified that this approach may not have all the answers, since it is not always apparent which changes are currently taking place in the industry and which changes will occur in the future. Yet the airline industry's evolution since deregulation may help explain the position the industry is in today, especially when its evolutionary stage is identified.

One of the oldest and most basic concepts for tracking the evolution of an industry is known as the industry life cycle. The underlying theme is that "an industry passes through a number of phases or stages--introduction, growth, maturity, and decline" (Porter 157). These different stages are shown in Figure 3. Basically, the stages of growth are characterized by the industry's rate of growth in sales over time, resulting in a vaguely S-shaped curve. Upon introduction sales are slow, eventually increasing significantly through the growth stage, leveling off in the maturity stage and eventually decreasing in the decline stage.

The slow growth upon introduction can be explained by the difficulty of attracting buyers to a new product. This

results in firms using promotions and other tactics to stimulate trials of the product. Once buyers become

Figure 3.



Source: Porter 158.

Time
Industry life cycle over time.

familiar with the industry's product, growth explodes as new buyers are attracted. This brings us to the growth stage. Towards the end of the growth stage most potential buyers have already been reached. This results in the rapid growth leveling off, bringing us into the maturity stage. During the maturity stage new substitutes begin to appear for the industry's product. The result is a decline in the growth rate, which puts us in the decline stage.

Along with the market growth of an industry which was mentioned earlier, there exist three other characteristics for each stage. They are: market size, competition and profits. These four characteristics possess certain conditions for each stage and when the conditions for each stage are met, it can be seen about where the industry is in its evolution.

Figure 4 shows the four characteristics and their conditions for each stage of the industry life cycle. As can be seen in the table, upon introduction market growth, market size and competition are relatively small, as would be expected with a new industry. Meanwhile, profits are

Figure 4.

Phase	Introduction	Growth	Maturity	Decline
Market Growth	Slow	Rapid	Slow-Level	Negative
Market Size	Small	Medium-expanding	Large	Contracting
Competition	Dominance by innovator, few firms	Entry, many competitors, shifting shares	Solidified shares, product stability	Exits, price competition
Profits	Variable, risky, high to low or negative	High and rising profits	Moderate to low profits	Low and falling profits

Industry life cycle and competition.

Source: Greer 36.

generally erratic. They can be anywhere from high to low or even negative. During the growth stage all four characteristics expand rapidly. More firms enter the industry since profits begin rising. Firms position themselves in the growing industry. Once the market becomes saturated and the market growth slows, maturity sets in. Market size has grown to about its full potential, while the competition begins to solidify its share of the market. Profits begin to decrease in comparison to the growth period with the result that fewer new firms are attracted to the industry. Finally, as substitutes become available the industry moves into the decline stage. Here market growth

is negative along with a declining market size. These factors, coupled with decreasing profits, result in forcing firms to exit the industry. This reduces the number of competitors.

Therefore, the big question is does, and if so, the United States air transport industry fit into the figure? Is it in the introduction, growth, maturity or decline stage? Of course the duration of each of the stages is different for each industry and sometimes it is not always clear which stage an industry is in. Furthermore, some industries do not always follow the S-shaped growth curve at all. They may go from introduction straight to decline. These problems with the industry life cycle may make it more difficult to work with, yet it still provides a framework from which the evolution of a firm can be traced (Porter 158).

Now that the industry life cycle has been fully explained it can be applied to the industry in question. I have chosen the year 1978 as the beginning of the airline industry, since it was in this year that the airlines were effectively cut loose from government regulation. Under government regulation the Civil Aeronautics Board controlled entry into the industry, prices and competitive practices. Therefore, the industry was unable to follow a course of free unrestrained evolution. Regulation may have effectively delayed the evolving process of the industry.

Consequently, 1978 is the year when the airlines were free to begin evolving as an industry without any outside guidance or control.

Introduction Stage

The year 1978 is the point of introduction of the industry, since it was in this year that the airlines were effectively cut loose from government control and allowed to develop like other industries in an open market. Under regulation the government controlled the development of the industry, so the industry life cycle model would not really apply to this period, since the government was an external force directing the industry.

The total number of passengers enplaned in 1978 was 274 million. This increased to 316 million in 1979. Yet from 1980 to 1982 total number of passengers enplaned hovered around 290 million. See Table 6. Therefore, market growth, measured by the number of passengers carried over a certain time period, 1978-1982, did not change considerably. This follows the introduction stage aspect of slow market growth.

Table 6. Passengers Enplaned in millions

<u>Year</u>	<u>Total</u>	<u>% from previous year</u>
1978	274 million	---
1979	316 million	15%
1980	296 million	-6%
1981	285 million	-3%
1982	294 million	3%
1983	318 million	8%
1984	344 million	8%
1985	382 million	11%
1986	418 million	9%
1987	447 million	6%
1988	454 million	1%
1989	453 million	-.2%
1990	465 million	2%
1991	318 million	-31%

Source: Air Transport Association of America, various years.

The next factor to examine is market size, and the same data that is used to measure market growth will be used to measure market size. For measuring the amount of competition, the number of carriers in the industry, the level of competition at the route level and market share of the nations airlines' will be examined. With the onset of deregulation in 1978 the United States had basically eleven passenger airlines. These firms existed upon the industry's introduction using 1978 as a starting date. These firms were well established and had developed route systems. Regulation played a major role in making this possible. Yet with deregulation, new firms could enter the industry, so between the years 1979 to 1990, 148 carriers entered the industry (Morrison 231). See Table 7.

Table 7.

Number of Certificated Air Carriers Providing Service				
Year	At End of Previous Year	New Carriers Added	Carriers Deleted	At End of Current Year
1979	43	22	5	60
1980	60	17	5	72
1981	72	16	8	80
1982	80	10	15	75
1983	75	18	9	84
1984	84	19	16	87
1985	87	18	19	86
1986	86	7	19	74
1987	74	5	11	68
1988	68	4	6	66
1989	66	5	11	60
1990	60	7	4	63
1991	63			
Total		148	128	

Source: U.S. Department of Transportation.

Even though 148 firms entered the industry 128 exited, following the industry life cycle model. Upon introduction the industry was dominated by a few firms until 1979 when 22 new firms entered the industry. Furthermore, eight of the

eleven original firms controlled about 83% of the domestic passenger miles along with having 1.52 effective competitors at the individual route level (Morrison 234), as seen in Figures 5 and 6, p.46. This all suggests few competitors. Meanwhile profits during the introductory period were somewhat high compared to the significant losses and profits of later years. See Table 8. In 1978 the industry had a profit of \$1.5 billion compared to a profit of \$441 million in 1979 when 22 firms entered the industry.

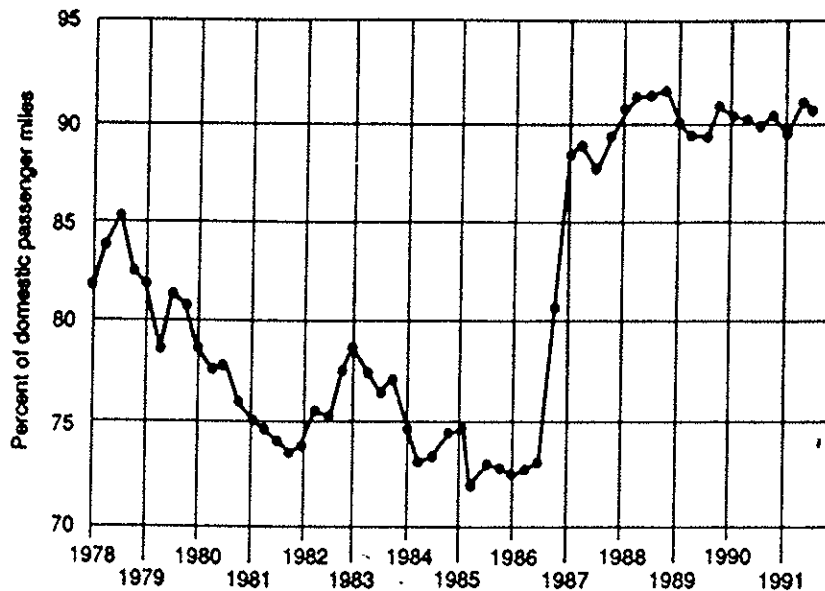
Table 8.

Airline Industry Profits in 1982 Dollars

<u>Year</u>	<u>Profit</u>	<u>% Change from Previous Year</u>
1976	892.7 million	---
1977	1040 million	16%
1978	1500 million	44%
1979	441.0 million	-70%
1980	-258.5 million	-158%
1981	-320.0 million	-24%
1982	-733.4 million	-129%
1983	180.9 million	124%
1984	765.6 million	325%
1985	777.9 million	1%
1986	-206.4 million	-126%
1987	505.1 million	-345%
1988	1400 million	177%
1989	101.2 million	-92%
1990	-2900 million	-2971%
1991	-2600 million	10%

Source: Air Transport Association of America, various years.

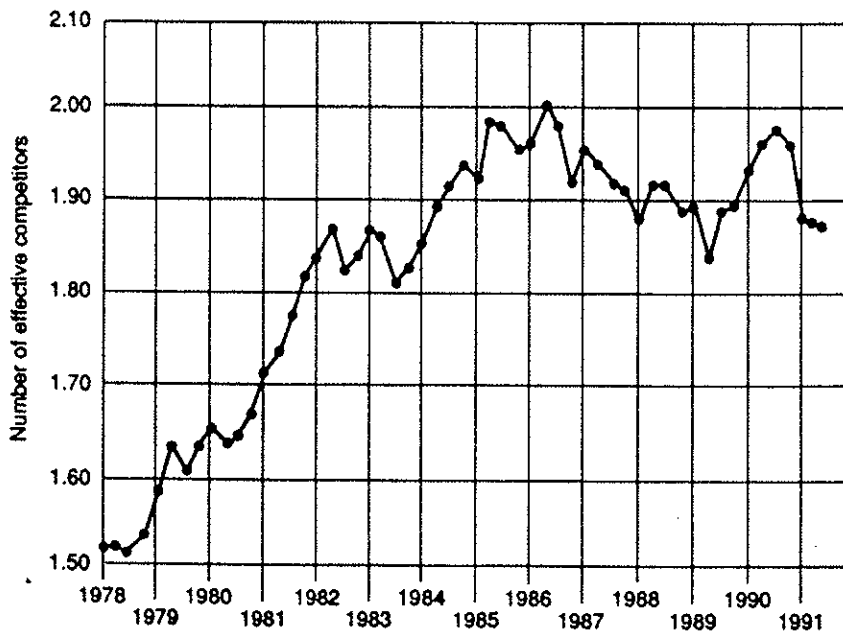
Figure 5.



Source: U.S. Department of Transportation.

Percentage of Domestic Passenger Miles Controlled by the Largest Eight Firms

Figure 6.



Source: Adapted from Steven A. Morrison and Clifford Winston, *The Evolution of the Airline Industry* (Washington, DC: The Brookings Institution, 1993).

Competition at the Route Level

Growth Stage

The growth stage of the industry covered the years 1983 to 1986, since market growth jumped by 100 million passengers over a four year period from 1980 to 1986. As indicated in Table 6, p.43, enplaned passengers increased from 318 million to 418 million over this period. See Table 6. Again this follows the life cycle model where rapid market growth appears in the growth stage along with expanding market size, using passenger enplanements to measure market size.

Meanwhile competition increased as more carriers entered the industry during this period for a total number of carriers at 74 by 1986. Also over this time period the percentage of domestic passenger miles controlled by the eight largest airlines generally declined from 82% in 1979 to 74% in 1985.

Profits in this time period were somewhat erratic, negative from 1980 to 1982, but positive from 1983 to 1985. The low was a profit of \$733.4 million, with a high of 777.9 million dollars in 1985. Generally, during the growth period profits are supposed to be high. Perhaps their erratic nature could best be explained by the recession which took place from 1980 to 1982.

Maturity Stage

In the maturity stage, market growth is supposed to be level and steady. This generally occurred in the years from 1987 to 1989. In 1987 the total number of passengers enplaned was 447 million with an increase to 465 million in 1990. In between those years the increases in enplaned passengers were generally small compared to the previous years. For example, in 1984, 344 million passengers were enplaned compared to 382 million in 1985, a one year increase of 38 million passengers. Furthermore, from 1982 to 1983 traffic increased by 24 million passengers. Compare that to 447 million in 1987 to 454 million in 1988. It is only a three million passenger increase in one year, and from 1988 to 1989 traffic actually decreased by one million passengers from 454 million to 453 million. Consequently, it appears that market growth leveled off in 1987 as did market size.

Competition in this time period should entail the firms strengthening their market share. By 1990 a total of 63 air transport firms operated in America, down from a peak of 87 in 1984. This suggests a consolidation in the industry since a "great merger wave occurred between June 1985, and October, 1987 when 14 mergers were consummated" (Morrison 233). Furthermore the percentage of passenger miles controlled by the eight largest firms increased from almost 75% in 1985 to 91% in 1990. With the demise of Eastern and

Pan Am Airlines in 1991, this trend appears to be continuing. The number of effective competitors at the route level has also steadily declined from almost two competitors in mid 1991 to less than 1.90 competitors in mid 1991 (Morrison 234).

The increase in individual airlines market share also suggests a strengthening of market share for the large firms. As illustrated in Table 9, in 1985 American Airlines had a 13.3% share of the market followed by United with 12.5% and Delta with 9%. By 1991 American had a 20.2% share, United an 18.7% share and Delta a 16.8% share. In 1985 these three airlines only controlled a 35% share of the total market; by 1991 they controlled a 55.7% share. Furthermore, Northwest and Continental each doubled their market share since 1985. This definitely represents a consolidation of the industry.

Table 9. Airline Market Share as a Percent of Total

	<u>1985</u>	<u>1991</u>
American	13.3	20.2
United	12.5	18.7
Delta	9.0	16.8
Northwest	6.7	12.4
Continental	4.9	9.7
USAir	-	8.0
TWA	9.6	6.7

Source: Standard and Poor's Industry Surveys 1992.2

In the maturity stage the airlines consolidated and increased their market share, while the number of

competitors decreased through bankruptcy and merger. Market growth experienced a leveling off, as the increases in the number of people traveling became smaller. The number of passengers enplaned from 1986 to 1987 increased by only six percent, while the number enplaned from 1987 to 1988 increased only one percent. This means that the airlines experience the maturity stage between the years 1987 and 1989.

Decline Stage

Yet this only covers three of the four stages of the industry life cycle. Has the airline industry reached the final stage of decline? Market growth would have to be negative. From 1990 to 1991 passengers enplaned dropped from 465 million to 318 million, but this may not be sufficient to suggest a negative growth in market size. Also, during this period there was a general economic downturn. In 1981 passengers enplaned dropped from 296 million in 1980 to 285 million. Yet, in 1982 the number jumped to 294 million. Therefore, even if the number of passengers enplaned dropped from 1990 to 1991, the amount may increase in following years.

Competition should decline. This has been the case with the exiting of Eastern, Pan Am and Midway from the market. Continental, TWA and America West are currently operating in Chapter 11 bankruptcy. Meanwhile American, United and Delta continue to grow and gain market share. Yet recently a wave of new small carriers has hit the air. Such new airlines as UltrAir, RenoAir, Family, and Kiwi Airlines have entered the market, but only as niche players serving a small section of the country with limited flights.

Finally profits should be low and falling. This has been the case with the industry losing \$2.9 billion in 1990 and \$2.6 billion in 1991. Once again though, the industry has experienced previous periods of loss, most notably from

1980 to 1982. These were recession years along with 1990 to 1991. Again the industry may very well rebound from this current period of losses, just as it has done in the past.

Conclusion to Industry Life Cycle Model

The airline industry definitely fits into some of the categories and characteristics of the Industry Life Cycle Model. Using 1978 as its date of introduction, since the government no longer had much control over the industry, we saw there were initially eleven firms at the onset of deregulation. These eleven firms were the original firms that the CAB granted airline authority to in the 1930's. These eleven firms also had a small market size from which to draw their customers, since before regulation many Americans could not afford to fly at the CAB regulated fares. Furthermore, since the new airlines needed time to establish themselves the eleven only competed among themselves, so the number of competitors was limited.

Market size increased upon deregulation, since new firms entered the industry offering lower fares, making it less expensive for Americans to fly. The increase in market size is most evident from 1983 to 1986 when the number of passengers traveling increased to 100 million, signaling a growth period. During this time period new airlines entered the market to challenge the dominant established airlines. Profits were somewhat erratic and market growth rapid. This is all evident of an industry in the growth stage.

From 1987 to 1989 market growth leveled off as did market size. The industry entered the maturity stage. The number of competitors in the industry was also reduced as

airlines merged or went bankrupt. This helped the remaining carriers to strengthen their market share, by doing this their profits increased too.

Whether or not the airlines have entered the decline stage is too early to tell. They have had losses for the last few years, and market size has contracted, but to know whether or not this means that the airlines are in the decline stage is difficult to tell, since our economy has just pulled itself out of a recession. Furthermore, the substitutes available for air travel are still somewhat limited, so the industry does not have too much competition from substitutes for its product.

Therefore, the Industry Cycle Model can contribute to the explanation of where the industry stands today. It is most likely in the maturity stage. The number of firms has declined and the remaining airlines have strengthened their market share. Profits are hard to come by right now, but that may be more related to the last recession than to the industry life cycle. This model has helped give us an explanation of where the industry is in its evolution and why its in the state that its in today.

III. Final Conclusion

Regulation provided a wall of security around the airlines against most of the effects of an economic downturn. During regulation the airlines faced limited competition and could usually count on some form of profit. The CAB had the power to grant the carriers fare increases if the economic conditions worsened. Consequently, the airlines received little incentive to operate efficiently. Even if an airline was in some form of financial distress the CAB usually followed a policy which protected or would strengthen that carrier, either by granting the firm new routes or by limiting entrance of other carriers to its existing routes. Therefore, the airlines did not have to rely on market forces to help them out of a hole. They could simply call on the CAB.

Then along came deregulation. The old carriers either had to sink or swim. The ones that could not trim costs and compete with the new low-cost, low fare charging carriers have disappeared from the market, but so have many of the new low cost carriers. These new carriers forced the established carriers to trim costs and become more efficient. When a recession occurs under deregulation the airlines can no longer count on the CAB to limit the number of competitors or control the fares charged. This leaves the high cost older carriers more vulnerable to the low-cost newer carriers, and it leaves all airlines more vulnerable

to the business cycle, since the product the airlines sell is income elastic. More people fly more when the economy and their incomes are good, and the quantity of air travel they demand is greater than the change in their incomes, and they demand much less air travel than the decline in their incomes when there is a downturn.

During regulation the airlines could make up for or at least lessen the difference by requesting fare increases from the CAB. Deregulation means they cannot go to the CAB for help. Deregulation has made the airlines more vulnerable to the business cycle since the product they sell is income elastic, and in any recessionary period the airlines will be forced to offer seats below cost to increase ridership, which they did not have to do during regulation.

The business cycle is part of the explanation for the state of the airline industry today, another part is the life cycle. Different stages of the industry life cycle are definitely evident in the years since deregulation. Introduction, growth and maturity are certainly noticeable. Whether or not the industry has reached the stage of decline still has yet to be decided. The information available to assert that the industry is in a state of decline is not yet available. Our economy has just come out of a recession and the signs of decline that are prevalent may just be the effects of the recession.

The industry is most likely in a state of maturity today, since there are fewer airlines and the rate of increase in market size has declined. This helps explain why some airlines have left the industry, because they could no longer compete with the other airlines that were trying to solidify their market share. They had to leave the industry. Even though the industry has experienced large losses, they may not be the result of a decline of the industry.

The business cycle is the most probable explanation for the current state of the United States airline industry, since the United States was just in a recession and it has been demonstrated that the airlines generally have losses during periods of economic downturn. These losses are generally more noticeable during deregulation than they were during regulation when the airlines had government protection from price competition. Therefore, the current state of the United States airline industry is the result of a recession during a deregulated period.

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