THE FUEL CRISES AND DEREGULATION: IMPACT ON AIRLINE OPERATIONS AND PROFITABILITY
U.S. Trunks Domestic Service: 1973-1982

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Introduction and Conclusions

This paper updates a presentation given at the Transportation Research Board's Second International Workshop on Aviation Forecasting in March 1981. The paper, titled "Aircraft Technology, Productivity and Operations, Impact on Costs and Yields" discussed the long-term aircraft and operational factors influencing real (inflation-adjusted) air fare levels; the United States domestic trunk airlines' reaction to the rapidly escalating fuel prices during the 1973-1979 time period; and the outlook for real air fares in the 1980s given uncertain fuel costs and domestic airlines deregulation enacted in late 1978.

This paper reviews the conclusions of the 1981 presentation. The data have been updated through 1982, extended back to 1973 and expanded to include more detailed labor and crew cost data. Conclusions are summarized as to the long term impact of the two fuel crises and deregulation on the domestic operations and profitability of U.S. trunk airlines. The presentation also includes some thoughts on the topic: "Is there a case for airline regulation as a public utility."

The long term impact of the fuel crises is indirect. The fuel crises distorted fundamental economic relationships and disrupted the level of worldwide economic activity with two major recessions. The continuing uncertainty of fuel supply and price will plague the airline industry in deciding future aircraft requirements.

The airline industry has many characteristics of a public utility. However, no strong economic case can be made for/aginst regulation. In the short-term, unit cost/price levels under a regulated system or a non-regulated system would be about the same. The case for/against regulation is more political than economic.

Up to now the success or failure of airline deregulation is in the eyes of the beholder. Other factors - such as the fuel crises, the air controller strike and the recession - confuse the analysis. While there have been some positive benefits, deregulation has been a financial disaster for the trunk airlines. The long term legacy of deregulation will be higher fares. The uncertainty of a deregulated environment, coupled with uncertain future fuel prices, will impede the development of new technology aircraft and result in higher operating costs.

A disturbing factor, exacerbated by deregulation, is the recent trend in the sales distribution system. It is no longer stretching the imagination to conceive that the air transportation industry will be dominated by outside marketing organizations who will take for themselves the benefits of future technology in an increasingly unregulated oligopolistic environment.

Conclusions From the 1981 Presentation

The 1981 paper noted that the United States airline world changed drastically during the 1970s due to two major events: the fuel crises and airline deregulation. The two fuel crises in 1973 and 1979 resulted in a three-fold increase in real jet fuel prices, completely altering the relationship between capital, energy, and labor. Adjustment to the higher energy cost level resulted in two worldwide economic recessions and a general slowdown in the rate of economic growth. This in turn reduced the demand for air travel. Airline deregulation radically altered the competitive structure of the airlines. Thus, as a result of these two major events, not only did the basic supply (cost)/demand (revenue) relationships of the domestic airlines drastically change but the level of industry activity itself was considerably below (as least 20 percent) what was reasonably expected before the 1979 fuel crisis.

The 1981 presentation concluded that future real air fares would have to increase to cover the increated price of fuel in the short run but could decrease in the long run and that the most significant long term impact of deregulation would be to bring labor costs under control. The presentation also included data showing that past improvement in aircraft efficiency (lower costs) was due more to the increase in the size of the aircraft than to technological advances.

Future Fare Levels

In the 1981 report, the question was posed: "Which way would real fares go in the 1980s in view of continuing inflation, uncertain but increasing fuel costs, and uncertain load factors?" It was concluded that real fares would continue going up 1.5 percent per year through 1982 and after that real fares could decline one percent per year (1982-1985), if the following assumptions proved to be true:

Real Fuel Price: Percent Increase

1981	+15 percent
1982	+ 8 percent
1983-85	+4 - 5 percent per year

All Other Direct and Indirect Operating Costs Per ASM Change at the 1975-80 Average Annual Historic Trend:

Crew	-1.1 percent
Direct Depreciation	-4.2
Direct Maintenance	-4.5
Indirect Maintenance	-1.1
Passenger Service	+0.6
Aircraft/Traffic Service	-1.7
Promotion/Sales	+2.5
General and Administrative	-4.5
Indirect Depreciation	-3.5
Transportation Related	-8.5

Real fares would increase through 1982 to cover the increase in real fuel prices in excess of a 5 percent improvement in fuel efficiency (gallons per available seat mile (ASM)), resulting from a more efficient fleet and more seats per aircraft. Real fares after 1982 would decline one percent per year if:

- Fuel prices increased no more than 5 percent over the rate of inflation;
- Operating efficiencies improved at the 1975-1980 rate; and
- Load factors gradually increase to 63 percent (118.3:Index 1973=100).

The first of these assumptions depended on the price of world oil. The second and third depended on the economy, the competitive situation arising from deregulation, and how the airlines reacted to deregulation.

Table 1. U.S. trunk - domestic service, real operating cost per ASM - 1982.

	1979 $ FORECAST 1/	1979 $ ACTUAL
DIRECT COSTS (DOC)		
CREW	0.69 ¢	0.65 ¢
FUEL	2.30	1.66
INSURANCE	0.01	0.01
OTHER	0.01	0.01
DEPRECIATION	0.30	0.31
MAINTENANCE	0.52	0.45
TOTAL DOC	3.83 ¢	3.09 ¢
INDIRECT COSTS (IOC)		
MAINTENANCE	0.09	0.09
PSGR. SERVICE	0.66	0.59
A/C TRAFFIC SERVICE	0.96	0.91
PROMOTION/SALES	0.79	0.87
GEN/ADMINISTRATIVE	0.18	0.21
DEPRECIATION	0.06	0.08
TRANSPT. RELATED	0.10	0.12
TOTAL IOC	2.82 ¢	2.88 ¢
TOTAL OPERATING COST (TOC)	6.65 ¢	5.97 ¢
TOC LESS FUEL	4.35 ¢	4.31 ¢

1/ TRB – 3/81

The March 1981 forecast of real operating cost per ASM, by component, for 1982 compared to actual 1982 results are shown in Table 1. As may be seen actual real total operating costs were 10 percent below forecast, all due to the wrong assumption regarding fuel prices. Instead of fuel prices continuing to increase, they stabilized and then decreased. In real terms (after adjusting for inflation) fuel costs per ASM were 28 percent below the forecast. The forecast of total operating costs, excluding fuel, were within one percent of forecast.

It should be noted that in 1981 there was a strong consensus that real fuel prices would increase at about 3-5 percent per year over the 1981-1991 period. Current consensus "suggests" that fuel prices will increase at about 1-2 percent per year, with most of the increase in the latter part of the decade. Future fuel prices are not forecastable with any high degree of confidence. It remains primarily a political unknown.

Impact of Deregulation

In the 1981 report, the following was concluded regarding the impact of deregulation on future fare levels:

> "It is becoming evident that the most significant long-term impact of deregulation will be to bring labor costs under control. This issue has been a sleeper; in all the years during the deregulation argument I have never heard a discussion of the impact of deregulation on labor. It was always assumed that labor's rights would be protected. Even Senator Edward Kennedy, a staunch supporter of unionized labor, was an early supporter of deregulation."

This conclusion was reached after an analysis of comparative operating costs of the one airplane type, the B-737-200, operated by trunks, locals, and "new carriers". The operating costs per ASM of the new carriers were considerably below those of the trunk and local carriers primarily due to lower wages and to work rules more favorable to the carrier. Due to the competition from the non-union, new carriers and the surplus pool of labor, including pilots, the only way for the large carriers to become price competitive would be by increasing productivity. Events have borne out the above conclusions.

Aircraft Productivity

In the 1981 presentation, a brief history was given of aircraft productivity improvements over the previous 35 years. Larger aircraft (more seats) and greater speed increased productivity (ASMs per year) which decreased real direct operating costs per ASM, as shown in Table 2. It also was stressed there was a big time lag between drawing board technological improvements and actual use in commercial airline operations.

An analysis of aircraft technological developments produced a big surprise: the past improvement in aircraft efficiency was due more to the increase in the size of the airplane, called economies of scale, than to technological advances. As shown on Figure 1, a comparison of the B-747 and B-707 concluded that only 22 percent of the reduced seat-mile cost was due to technology and 78 percent was due to the increase in aircraft size (number of seats).

A comparison of direct operating costs per ASM of all aircraft operated by United States trunk carriers in domestic operation in 1982 is shown in Table 3. The importance of aircraft size in determining operating costs is supported. Other factors, such as flight distance and technology (age of aircraft), are also important. Cruise speed is no longer a factor as all aircraft are jets; obviously block speed (distance divided by time between actual departure/arrivel at the gate) varies directly with distance.

A comparison of direct operating costs per ASM, by distance, of a larger aircraft (DC-10) with a smaller aircraft (B-727-200 Adv.) is shown in Figure 2. The DC-10 has lower seat-mile costs at all distances, even at 250 miles. (Load factor is not considered as this is a function of the size of the market and the number of carriers competing in the market. That is, load factor has to do with demand and not with operating efficiency and costs.)

Since direct operating (aircraft) costs per ASM decrease as the size of the aircraft increases, the airplane may be considered as a factory (producing seats between two points, or ASMs) subject to increasing returns to scale. By this, economists mean that as the scale of operations increases, returns increase or unit costs decrease. In economic theory this usually has to do with the size of the plant -- a technical relationship between the various factors of production -- and not the size of the firm which incorporates many other considerations including demand and finance.

This issue is very important. Support for airline deregulation was based, in part, on the fact that large airlines did not have lower unit costs than smaller airlines. Since it was contended there were no economies of scale in the airline industry, there was no benefit to society in regulating airlines as a public utility. This issue will be discussed later.

Table 2. Historical trend of capacity, seats, productivity and operating costs, U.S. Domestic (1981 report).

AIRCRAFT TYPE	YEAR INTRODUCED	AVAILABLE SEATS	BLOCK SPEED MILES/HOUR	ANNUAL AVAILABLE SEAT-MILES MILLIONS	D.O.C. PER AVAILABLE SEAT MILE 1976 $
DC-3	1936	21	150	6	5.90¢
CONSTELLATION	1945	46	290	33	3.90¢
SUPER CONSTELLATION	1952	58	285	55	3.95¢
B707-120/DC-8-10	1959	112	450	125	2.90¢
DC-8-60	1967	196	470	250	2.60¢
B747-100	1970	380	470	700	1.90¢
L-1011-1	1972	256	480	375	1.95¢

Figure 1. Economics of size and technology: past improvement in efficiency (lower costs) due more to economy of scale (size) than to technological advances (1981 report).

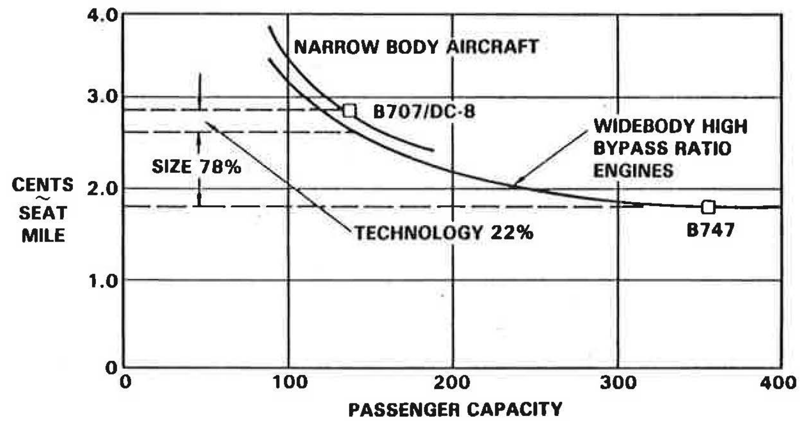


Table 3. Direct operating costs/ASM versus aircraft size, domestic trunks - 1982.

AIRCRAFT	DOC/ASM (¢/ASM)	NO. SEATS (AVG)	AVG. FLT. DIST. (ST. MILES)
DC-9-30	5.1¢	95	406
B727-100	5.0¢	108	677
B737-200	4.4¢	122	401
B727-200	4.2¢	144	639
B707's	5.4¢	149	766
DC-8's	4.1¢	200	834
A300's	3.7¢	242	816
DC-10's	3.6¢	262	1379
L-1011's	3.7¢	288	1038
B747's	3.0¢	406	2116
AVG.	4.1¢	172	689

The Trunk Airlines: 1973-1982

Prior to 1970 there was a mutually reinforcing upward spiral at work in air transportation. As new technology aircraft were introduced there was a reduction in costs; this resulted in lower yields which in turn generated increased traffic. In addition, as the world economy was rapidly growing, airline traffic was booming. This enabled more efficient aircraft to be introduced into service because the airlines had the ability to finance them. Thus, the combination of an expanding economy, improving technology, and increasing efficiency (size and speed) of airplanes, mutually reinforced one another to produce a larger and more efficient air transportation industry.

Figure 2. Airplane - a factory subject to increasing returns to scale (decreasing costs with larger aircraft).

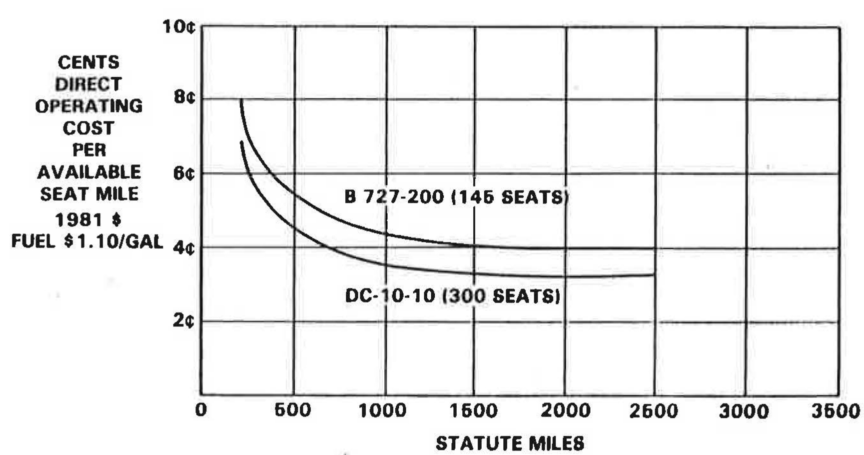
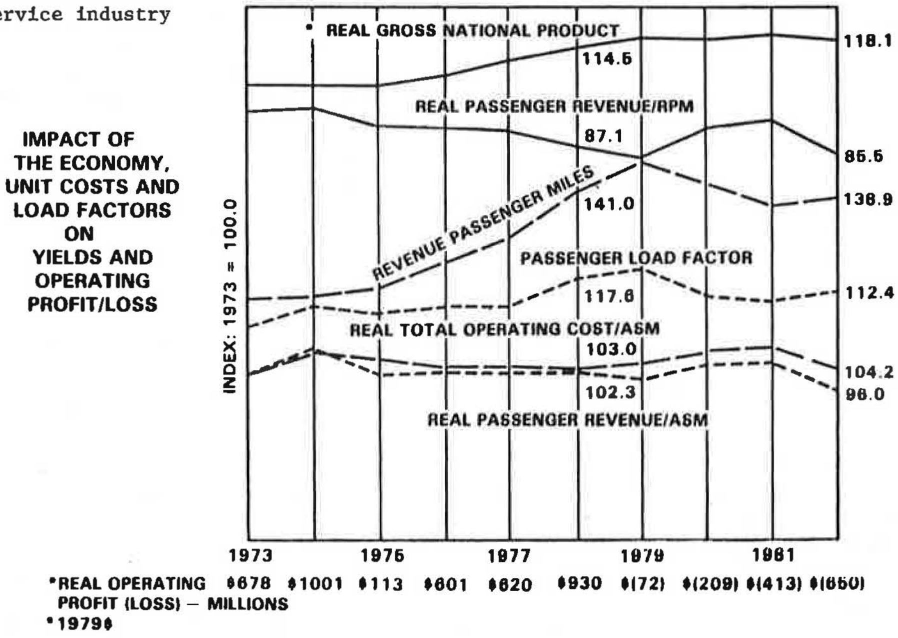


Figure 3. Domestic trunk service industry trends, 1973-1982 (a):



During the period 1950-1970, the average size of aircraft in trunk domestic operations increased 3.5 times and speed 2.3 times. Safety also improved markedly. Real yields decreased 35 percent. Combined with a growing economy, traffic measured in revenue passenger miles (RPMs) increased twelve times.

During this period (1950-1970) the passenger received an improving product, safer and more reliable, and at less cost. Airline wages were increasing (perhaps too much) and while airline profits were not high relative to other industries, they were at least positive and enough to attract capital to finance constantly improving aircraft. New airports were built and financed to a great extent by the flying public in every major city in the United States. The manufacture of commercial aircraft, indirectly supported by military research and development, became one of the largest positive items in the United States balance of trade.

As we know, the world and especially the airline world has changed dramatically since 1973. Figure 3 shows various industry trends relating airline unit costs, load factor and the U.S. economy to yields and operating profit/loss:

- Real gross national product increased by about 1.9 percent per year; however, the economy experienced the two biggest post World War II downturns during the nine-year period.

- Real yields (passenger revenues per RPM adjusted for inflation) decreased 17 percent between 1973 and 1979 and especially in 1978 and 1979 under the impact of deregulation; yields increased in 1980 and 1981, as fuel prices soared as a result of the Iranian crises; and dropped sharply in 1982 as fuel prices dropped and fare wars increased.

- As a consequence of the above, revenue passenger miles increased by over 50 percent between 1973 and 1979. However, RPMs fell 10 percent between 1979 and 1982 due to a stagnating economy.

- Load factors averaged between 52-55 percent between 1973 and 1977, and reached a peak of 63 percent in 1975. The high load factors were achieved at the expense of low real yields. Load factors dropped sharply in 1980 and 1981 as yields increased; in 1982 load factors increased to 59 percent, as yields fell sharply.

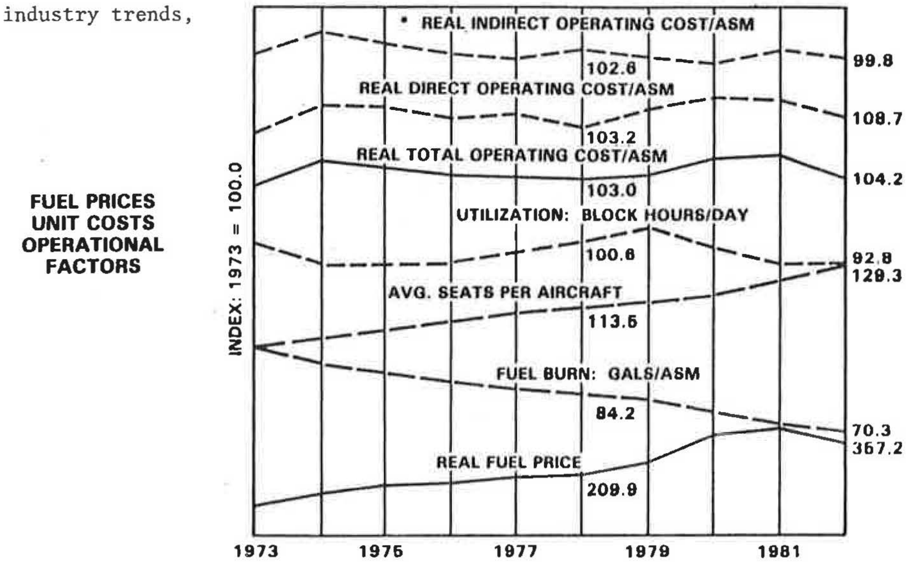
- Total operating costs per ASM, except for an increase in 1974 after the first fuel crisis, was relatively flat until 1979-1980 and then dropped again.

- Passenger revenue per ASM, taking into account lower load factors, dropped 4 percent during the nine-year period compared to the 4 percent increase in costs per ASM.

- It is interesting to point out that the two highest real profit years for domestic trunk operations were 1974 (first year in the fuel crisis) and 1978 (the year when the Deregulation Act was passed). Since 1979 industry real losses (inflation adjusted) have become progressively worse.

The operational and cost factors that produced these results are shown on Figure 4. Real fuel price increased sharply in 1974; then increased slowly until the second fuel crisis in the latter part of 1979 and reached a peak in 1981 when it was four times greater than in 1973. Real fuel price fell 11 percent in 1982 versus 1981. Despite these tremendous increases in fuel price, real total operating costs per ASM increased only 13 percent between 1973 and 1981, and then fell 8 percent in 1982 compared to 1981. Real direct operating costs per ASM, which includes fuel, increased 10 percent in 1974 and gradually decreased through 1978. After the fuel increase in 1979-81, real direct operating per ASM increased reaching a peak in 1981 and then dropped in 1982. In 1982, real direct operating costs per ASM was only 8.7 percent above 1973.

Figure 4. Domestic trunk service industry trends, 1973-1982 (b):



How were operating costs kept under control? One major factor was the 30 percent improvement in fuel burn (gallons per ASM) over the nine year period - or 3 percent per year. In addition, productivity (ASMs per aircraft) increased as average seats per aircraft increased by a similar amount (29 percent). After 1974, aircraft utilization (block hours per day) increased, peaking at 9.7 hours per day in 1979, which also increased productivity. Since 1979, utilization dropped to 8.4 hours per day.

The other component of total operating costs, indirect operating costs, generally reflect airline operations in contrast to aircraft operations reflected in direct costs. Indirect operating costs, in real terms, were virtually constant the entire period. They increased in 1974, but then dropped back.

During the period between the first fuel crisis in 1973 through 1978 (the last year before deregulation and before the second fuel crisis) real yields decreased 13 percent in spite of the more than doubling of fuel prices and a 50 percent increase in the inflation rate. Moreover, the airlines made reasonable profits in each year except 1975. But with increasing competition in 1979 resulting in lower yields, the industry registered a small loss, even with high load factors, high utilization, and a strong economy. The industry's profits have continued to deteriorate due to a combination of increasing costs and inadequate revenues (traffic decline due to the worsening economy) as load factors dropped in response to higher fares.

An analysis was made by aircraft type to better understand the impact of fleet mix and operations on fuel efficiency and, hence, direct operating costs. As shown in Table 4, fuel gallons per ASM dropped 32 percent between 1972 and 1982, or 3.2 percent per year. There was a fuel consumption improvement across the board; even old clunkers improved.

Table 4. U.S. trunk domestic service fuel efficiency: total fleet (passenger aircraft) and aircraft type, 1973-1975-1979-1982.

	FUEL GALS/ASM				% DECREASE		PERCENT FLEET ASMS			
	1973	1975	1979	1982	1973-82	AVG	1973	1975	1979	1982
DC-9-30	0.0339	0.0330	0.0321	0.0269	20.6	2.1	6.7%	5.6%	3.4%	3.2%
B737 (ALL)	0.0316	0.0302	0.0274	0.0202	36.1	3.5	3.0	2.4	2.1	2.2
B727-100	0.0371	0.0350	0.0321	0.0279	24.8	2.5	16.9	15.8	12.7	7.3
B727-200	0.0321	0.0303	0.0281	0.0239	25.5	2.6	14.1	22.4	34.3	41.2
B707 (ALL)	0.0329	0.0300	0.0276	0.0270	21.9	2.2	12.3	11.6	7.6	1.6
DC-8-10/50	0.0390	0.0368	0.0311	–	–	–	6.7	3.8	1.3	–
DC-8-60/70	0.0286	0.0256	0.0247	0.0227	20.6	2.1	5.9	5.1	4.3	2.9
L-1011's	0.0263	0.0251	0.0206	0.0191	27.4	2.7	1.9	6.8	10.1	12.4
DC-10	0.0235	0.0227	0.0205	0.0193	17.9	1.9	9.8	14.6	13.4	15.7
B747	0.0231	0.0212	0.0193	0.0176	23.8	2.4	6.5	9.7	8.5	8.8
A300B's	–	–	–	0.0195	–	–	–	–	0.9	2.4
SUB-TOTAL	0.0349	0.0288	0.0269	–	–	–	83.8	97.8	98.5	97.6
OTHER	0.0210	0.0745	0.0651	–	–	–	16.2	2.2	1.5	2.4
TOTAL	0.0320	0.0291	0.0260	0.0222	32.3	3.2	100%	100%	100%	100%

Table 5. U.S. trunk domestic service operations impact on fuel efficiency, total fleet (passenger aircraft) and aircraft type, 1973-1975-1979-1982.

	AVG SEATS PER AIRCRAFT				BLOCK HOURS PER DAY UTILIZATION				AVG. FLIGHT DISTANCE			
	1973	1975	1979	1982	1973	1975	1979	1982	1973	1975	1979	1982
DC-9-30	90	90	91	95	10.26	9.01	9.41	8.15	334	342	356	406
B737 (ALL)	94	96	104	122	6.92	6.17	8.06	7.19	306	301	309	401
B727-100	96	97	102	108	8.74	8.00	9.23	7.18	560	565	633	677
B727-200	123	127	132	144	8.66	9.02	10.29	8.94	498	492	577	639
B707 (ALL)	129	138	144	149	8.60	8.89	9.33	5.36	986	949	1,042	756
DC-8-10/50	127	131	134	–	9.30	7.23	8.02	–	880	829	1,090	--
DC-8-60/70	169	184	187	200	8.40	8.47	9.81	7.77	982	975	1,043	834
L-1011's	222	242	284	288	8.21	7.93	10.23	9.21	1,185	882	1,000	1,038
DC-10's	233	234	256	262	9.38	8.71	9.94	8.57	980	1,100	1,295	1,379
B747's	332	363	378	406	10.65	8.85	12.09	10.16	1,739	1,775	2,021	2,116
A300B's	–	–	240	242	–	–	10.11	8.82	–	–	893	816
TOTAL	133	142	153	172	9.09	8.28	9.72	8.44	571	582	639	689

What caused the improvements? As shown on Table 5, in each case the number of seats per aircraft increased and the average flight distance increased except for the older B-707/DC-8s and the A300-Bs. But most important was the distribution of total ASMs by aircraft type. Over the nine-year period the fuel efficient 727-200 became the dominant shorter-range aircraft while the fuel-efficient wide-body trijets replaced the B707/DC-8 aircraft as the dominant longer-range aircraft type.

An analysis, by component, of direct and indirect operating costs, shown on Table 6, shows the extent to which other operating efficiencies enabled the airlines to absorb the huge fuel price increases. The other components of direct operating costs (crew, insurance, depreciation, and maintenance), when measured in terms of ASMs, all decreased between 1973 and 1982. Crew and maintenance had strong decreases since 1979. With regard to indirect costs, every component decreased during the nine-year period except promotion/sales. Promotion/sales costs increased substantially between 1979 and 1982, while passenger and aircraft service decreased faster during this three-year period. All in all, indirect costs per ASM were remarkably constant during the nine-year period. Interest

Table 6. U.S. trunk domestic service real operating costs per ASM, 1973-1975-1979-1982, (1979 dollars).

	CENTS PER ASM				AVG ANNUAL CHANGE			
	1973	1975	1979	1982	1973-75	1975-79	1979-82	1973-82
DIRECT COSTS								
CREW	0.745¢	0.738¢	0.706¢	0.645¢	-0.5%	-1.1%	-2.8%	-1.4%
FUEL	0.688	1.125	1.532	1.664	+28.0	+ 8.0	+ 2.8	+ 10.3
INSURANCE	0.025	0.022	0.012	0.009	-6.2	-14.0	-7.7	-5.7
OTHER	0.001	0.146	0.008	0.012	*	*	*	*
DEPRECIATION	0.624	0.402	0.331	0.314	-19.2	-4.7	-1.7	-4.6
MAINTENANCE	0.760	0.719	0.582	0.450	-2.5	-2.1	-7.1	-3.9
TOTAL DOC	2.843¢	3.152¢	3.171¢	3.094¢	5.3%	0.1%	-0.8%	-0.9%
INDIRECT COSTS								
MAINTENANCE	0.101¢	0.102¢	0.097¢	0.094¢	+ 0.5%	-1.2%	-1.0%	-0.7%
PSGR. SERVICE	0.640	0.617	0.636	0.590	– 1.8	0.7	-2.3	-0.8
AIRCRAFT/TRAFFIC SERVICE	1.102	1.075	0.999	0.912	-1.2	-1.7	-2.8	-1.8
PROMOTION/SALES	0.672	0.672	0.739	0.867	0.0	2.4	+5.5	+2.9
GENERAL AND ADMINISTRATIVE	0.265	0.262	0.212	0.216	-0.6	-5.3	+0.6	-1.9
DEPRECIATION	0.101	0.085	0.070	0.076	-8.2	-4.3	+2.8	2.5
TRANSPORTATION RELATED	–	0.216	0.133	0.119	--	-11.4	-3.4	
TOTAL IOC	2.881¢	3.029¢	2.885¢	2.874¢	2.5%	-1.2%	-0.13%	0.0%
DOC/IOC RATIO	987	1.041	1.099	1.077	-	-	-	
TOTAL OPERATING COST	5.724¢	6.181¢	6.056¢	5.968¢	4.0%	-0.6%	-0.5%	+0.5%
INTEREST EXPENSE	0.122¢	0.1664¢	0.136¢	0.211¢	4.4%	2.8%	+15.8%	+7.3%
TOTAL COSTS INCL INTEREST	5.906¢	6.2404	6.192¢	6.179¢	3.9%	0.4%	0.00	+0.0%

*NEGLIGIBLE % OF DOC

expense per ASM, while still a small item, increased over 70 percent. Insurance costs per ASM are now so small they can be ignored.

It is interesting to note the changes in the percentage distribution of the components of direct and indirect operating costs between 1973 and 1982, as shown in Table 7. In 1973, the four major components of direct cost were about equal. In 1982, fuel represented over half; crew about one fifth; and depreciation and maintenance combined, about one quarter. These are to be expected in view of the fuel price increases.

the most, as expected, from 40.0 percent to 28.4 percent and in absolute real terms fell 21.4 percent. Labor's share of indirect costs was fairly constant and only fell since 1979, about 6.3 percent. Other non-fuel costs decreased 15.7 percent during the nine-year period; their share fell from 43.3 percent to 35.1 percent.

Comparison of the labor/non-labor split of passenger service and promotion/sales costs since 1979 indicates that passenger service non-labor costs has dropped significantly while the non-labor cost of promotion/sales has increased

Table 7. U.S. trunk domestic service real operating cost per ASM, 1973-1975-1979-1982 (1979 dollars).

	PERCENT OF TOTAL			
	1973	1975	1979	1982
DIRECT COSTS				
CREW	26.2%	23.4%	22.2%	20.8%
FUEL	24.2	35.7	48.4	53.8
INSURANCE	0.9	0.7	0.4	0.3
OTHER	0.0	4.6	0.3	0.4
DEPRECIATION	22.0	12.8	10.4	10.2
MAINTENANCE	26.7	22.8	18.3	14.5
TOTAL DOC	100.0%	100.0%	100.0%	100.0%
INDIRECT COSTS				
MAINTENANCE	3.5%	3.4%	3.4%	3.3%
PSGR. SERVICE	22.2	20.4	22.0	20.5
AIRCRAFT/TRAFFIC SERVICE	38.3	35.5	34.6	31.7
PROMOTION/SALES	23.3	22.2	25.6	30.2
GENERAL AND ADMINISTRATION	9.2	8.6	7.4	7.5
DEPRECIATION	3.5	2.8	2.4	2.6
TRANSPORTATION RELATED	–	7.1	4.6	4.2
TOTAL IOC	100.0%	100.0%	100.0%	100.0%
DOC/IOC RATIO	0.987	1.041	1.101	1.077

However, the changes in indirect cost may reflect the longer term impact of deregulation: lower passenger/aircraft service costs and higher promotion/sales costs per ASM, both in relative terms as well as in absolute real terms. Lower service costs per ASM possibly may reflect more efficient operations, or less service.

An analysis of the labor component of costs is shown in Tables 8 and 9.

Over the past nine years, labor's share of total operating costs fell from 44.0 percent to 37.0 percent. In absolute real terms it dropped 13.4 percent. Labor's share of direct costs fell significantly. A comparison of labor and non-labor costs per ASM of individual components from Tables 6 and 8 are as shown in Table 10.

It would appear that since 1979: unit labor costs (including crew) have decreased in most categories, except passenger service; and non-fuel other costs decreased in all categories, except promotion/sales, whose increase virtually offset the decrease of the others. In view of the recent concessions in wages and work rules made by both unionized and non-union employees, real unit labor costs will continue to decrease significantly.

Table 8. Real total operating costs/ASM, by labor, fuel and other (1979 dollars).

	1973	1975	1979	1982	% Change 1973-1982
LABOR	2.551¢	2.492¢	2.411¢	2.210¢	-13.4%
FUEL	.688	1.125	1.532	1.66	+141.9%
OTHER	2.485	2.564	2.113	1.09	-15.7%
TOTAL	5.724¢	6.181¢	6.056¢	5.968¢	+4.3%
	PERCENT DISTRIBUTION				
LABOR	44.6%	40.3%	39.8%	37.0%	
FUEL	12.1%	18.2%	35.3%	27.9%	
OTHER	43.3%	41.5%	34.9%	35.1%	
TOTAL	100.0%	100.0%	100.0%	100.0%	

Table 9. U.S. trunk domestic service real labor costs per ASM, 1973-1975-1979-1982 (1979 dollars).

	CENTS PER ASM				AVG. ANNUAL CHANGE			
	1973	1975	1979	1982	1973-75	1975-79	1979-82	1973-82
DIRECT COSTS								
CREW	0.698¢	0.693¢	0.665¢	0.609¢	-0.3%	-1.0%	-4.2%	-1.3%
MAINTENANCE	0.440	0.411	0.343	0.286	-3.2	-4.1	-8.3	-3.4
TOTAL LABOR IN DIRECT COSTS	1.138¢	1.104¢	1.008¢	0.895¢	-1.5	-1.9	-5.6	-2.3
% LABOR OF DIRECT COSTS	40.0%	35.0 %	31.8%	28.9%	–	–	–	–
INDIRECT COSTS								
MAINTENANCE	0.068¢	0.066¢	0.065¢	0.067¢	–	-0.3	+ 1.6	+ 0.2
PASGR. SERVICE	0.255	0.263	0.290	0.301	+ 1.5	+ 2.5	+ 1.9	+ 1.9
AIRCRAFT/TRAFFIC SERVICE	0.731	0.703	0.681	0.609	-1.9	-0.8	-5.8	-1.7
PROMOTION SALES	0.239	0.232	0.256	0.235	-1.5	+ 2.6	-4.1	-0.2
GENERAL/ADMINISTRATIVE	0.122	0.124	0.111	0.103	+ 0.6	-2.6	-3.6	-1.6
TOTAL LABOR IN INDIRECT COSTS	1.413¢	1.388¢	1.403¢	1.315¢	-0.9	+ 0.3	-3.2	-0.8
% LABOR OF INDIRECT COSTS	49.0%	45.8%	48.6%	45.8%			–	
TOTAL LABOR IN TOTAL OPERATING COSTS	2.551¢	2.492¢	2.411¢	2.210¢	-1.2%	0.8%	-4.1%	-1.4%
% LABOR IN TOTAL OPERATING COSTS	44.6%	40.3%	39.8%	37.0%				

Comparative Costs: "New" versus Existing Airlines

In the 1981 report, an analysis was made of the operating costs of the one airplane type flown by the diverse categories of airlines - the B-737-200. This analysis has been updated: Table 11 compares these costs for the year 1982 for the trunks, locals, and several "new" carriers. (Only one trunk carrier operated this aircraft.) Again, what stands out is the high direct operating costs per ASM of the trunks compared to the "new" carriers. Again we compare the number of seats per aircraft, average flight distance and other factors to assure that the differences are not due primarily to these factors. Again, it must be concluded that lower crew costs account for most of direct operating cost advantage of the "new" carrier.

1982 costs were compared to 1980 costs to see if the trunk costs decreased and "new" carrier costs increased during those two years. It would appear that such a trend is taking place, as shown on Tables 12 and 13. Finally, an analysis was made of

Table 10. Labor and non-labor cost per ASM.

	1979	1982	Percent Change
Passenger Service	.635¢/ASM	.590¢/ASM	- 7.1 percent
Labor	.290¢	.301¢	+ 3.8
Other	.345¢	.289¢	-16.2
Promotion/Sales	.739¢/ASM	.867¢/ASM	+17.3
Labor	.256¢	.235¢	- 8.2
Other	.483¢	.531¢	+10.1
Aircraft Service	.999¢/ASM	.912¢/ASM	- 7.1
Labor	.681¢	.629¢	-10.6
Other	.318¢	.303¢	- 4.7
Maintenance/Direct	.582¢/ASM	.450¢/ASM	-22.7
Labor	.343¢	.286¢	-16.6
Other	.230¢	.164¢	- 4.7
Maintenance/Indirect	.097¢/ASM	.094¢/ASM	- 3.1
Labor	.065¢	.067¢	+ 3.1
Other	.32¢	.027¢	-15.6
General Administration	.212¢/ASM	.216¢/ASM	+ 1.9
Labor	.111¢	.103¢	- 7.2
Other	.101¢	.113¢	+11.9

Table 11. Comparative direct operating costs per ASM - 1982 (B-737-200).

	SOUTHWEST	AIR FLORIDA	AIRCAL	PEOPLE EXPRESS	LOCALS	TRUNKS
OPERATING COSTS						
CREW	0.471¢	0.330¢	0.930¢	0.291¢	1.011¢	1.154¢
FUEL	2.195	2.081	2.420	1.880	2.364	2.039
INSURANCE/OTHER	0.041	0.107	0.030	0.096	0.037	0.015
DEPRECIATION	0.433	0.788	0.735	0.227	0.471	0.461
MAINTENANCE	0.479	0.647	1.111	0.341	0.698	0.727
TOTAL	3.619¢	3.953¢	5.226¢	2.763¢	4.581¢	4.396¢
OPERATIONAL FACTORS						
NO. OF AIRCRAFT (AVG)	31.4	11.6	14.9	16.4	94.7	60.6
NO. OF SEATS (AVG)	118	125	114	118	109	122
UTILIZATION (BLOCK HOURS)	11.91	8.02	8.74	11.09	8.86	7.19
PSGR LOAD FACTOR	61.6%	48.5%	52.5%	60.9%	57.7%	57.1%
AVG FLIGHT DISTANCE (MILES)	297	355	335	426	343	401
GALLONS/ASM	0.0226		0.0230	0.0193	0.0239	0.0202

Table 12. Comparative direct operating costs per ASM: B-737-200 (years ended September 1980 and December 1982).

	LOCALS			TRUNKS		
	1980	1982	% CHANGE	1980	1982	% CHANGE
OPERATING COSTS						
CREW	0.861¢	1.012¢	+17.6%	1.495¢	1.154¢	-22.8%
FUEL	2.163	2.364	+ 9.3	2.117	2.039	-3.7
INSURANCE/OTHER	0.031	0.037	+19.4	0.011	0.015	+36.3
DEPRECIATION	0.375	0.471	+25.6	0.324	0.461	+42.3
MAINTENANCE	0.653	0.698	+6.9	1.083	0.727	-33.9
TOTAL	4.083¢	4.582¢	+12.2%	5.030¢	4.396¢	-12.6%
OPERATIONAL FACTORS						
NO. OF AIRCRAFT (AVG)	68	95	+27 A/C	68	61	-7 A/C
NO. OF SEATS (AVG)	107	109	1.9%	106	122	+15.7
UTILIZATION (BLOCK HOURS)	9.31	8.85	-4.9	7.16	7.19	0.4
PSGR. LOAD FACTOR	55.0%	57.7%	+4.9	59.7%	57.1%	-4.4
AVG FLIGHT DISTANCE (MILES)	328	343	+4.6	334	401	+20.1
GALLONS/ASM	0.0250	0.0239	-4.4%	0.0256	0.0202	-21.1

the components of crew costs for these various carriers in 1982 as shown on Table 14. It is interesting to note that benefits/pensions, which account for about 20 percent of the trunk and local carrier total crew costs, exceeded the total crew costs of People Express. These data speak for themselves.

Conclusions

It is virtually impossible to make clean conclusions as to the impact of the 1973 and 1979 fuel crises and of deregulation on the airlines. While the Airline Deregulation Act was passed in late 1978, the impact of a more competitive airline environment

Table 13. Comparative direct operating costs per ASM: B-737-200 (years ended September 1980 and December 1982) (Air Cal, Southwest, Air Florida).

	AIR CAL			SOUTH WEST			AIR FLORIDA		
	1980	1982	% CHANGE	1980	1982	% CHANGE	1980	1982	% CHANGE
OPERATING COSTS									
CREW	0.669	0.930	+39.0%	0.418	0.471	+12.7%	0.361*	0.330	-8.6%
FUEL	2.485	2.420	-2.7	2.065	2.195	+6.3	2.065	2.081	+0.8
INSURANCE/OTHER	0.022	0.030	+36.4	0.039	0.041	+5.1	0.063	0.107	+69.8
DEPRECIATION	0.432	0.735	+70.1	0.360	0.433	+20.3	0.839	0.788	-6.1
MAINTENANCE	0.980	1.111	+13.4	0.483	0.479	-0.8	0.460	0.647	+40.7
TOTAL	4.588¢	5.226¢	+13.9%	3.365¢	3.619¢	+7.6%	3.788	3.953	4.4%
OPERATIONAL FACTORS									
NO. OF AIRCRAFT (AVG)	12	15	+3 A/C	60	32	-28 A/C	11	12	+1 A/C
NO. OF SEATS (AVG)	121	114	-5.8%	118	118	—	116	125	+7.8%
UTILIZATION (BLOCK HOURS)	10.42	8.74	-16.1	11.13	11.91	+7.0	9.36	8.02	-14.7
PSGR. LOAD FACTOR	70.6%	52.5%	-25.6	68.4%	61.6%	-10.0	64.0%	48.5%	24.2
AVG. FLIGHT DISTANCE (MILES)	286	335	+17.1	276	297	+7.6	402	355	-11.7
GALLONS/ASM	0.0249	0.0230	-7.6	0.0246	0.0226	-8.1	0.0227	N/A	

*ESTIMATED

Table 14. Comparative crew costs per ASM - 1982 (B-737-200).

CREW	SOUTHWEST	AIR FLORIDA	AIRCAL	PEOPLE EXPRESS	LOCALS	TRUNKS
PILOTS/COPILOTS	0.372¢	0.272¢	0.613¢	0.170¢	0.713¢	0.774¢
OTHER FLIGHT PERSONNEL	—	0.018	0.003	—	—	—
TRAINERS/INSTRUCTORS	—	0.003	0.008	—	0.018	0.046
PERSONNEL EXPENSES	0.047	0.037	0.060	0.020	0.048	0.059
EMPLOYEE BENEFITS/PENSIONS	0.040	—	0.185	0.014	0.210	0.250
PAYROLL TAXES	0.012	—	0.061	0.015	0.022	0.026
TOTAL CREW	0.471¢	0.330¢	0.930¢	0.219¢	1.011¢	1.154¢

was becoming felt one or two years earlier. (The impact of the air controller's strike in the summer of 1981 and the subsequent reduction in capacity at several major airports, while significant at the time, is not considered as having a long-term impact.) While these two major events are intertwined, an attempt is made to evaluate each individually.

The immediate direct impact of the doubling and then the redoubling of jet fuel prices was:

- to accelerate the introduction of more fuel efficient aircraft;
- to increase the fuel efficienty of existing aircraft; and
- to increase aircraft productivity at the expense of poorer service by adding more and lighter-weight seats.

However, the long-term dominant impact of the fuel crises on the airlines is the indirect one. The energy crises had a devastating impact on the United States and world economies. It changed drastically the existing relationships between energy, labor and capital. Just as many existing aircraft were rendered obsolete by the jump in fuel price, the same happened to much of the U.S. industrial plant. In many industries such as auto, steel, etc., U.S. plants were significantly older than those in West Germany, Japan, and other countries. This put the U.S. at a great competitive trade disadvantage and as a consequence the U.S. is experiencing strong deficits in international trade. The energy crises changed the distribution of the world's wealth and exacerbated the world's international financial problems. The first energy crisis caused a worldwide recession - the worst since World War II - and the second energy crisis caused worldwide double-digit inflation. To curb inflation, the U.S. and other countries have in recent years turned to restrictive monetary policies (i.e., higher interest rates). This, however, produced a second world recession - another worst since World War II.

The impact of the lower growth in real income on the airlines was to increase their costs and to lower demand. As many aircraft were made obsolete by the higher fuel prices, airlines began acquiring new aircraft. While these were fuel efficient, they were more expensive as they were designed and manufactured at post-inflation costs. The uncertainty as to future fuel prices continues to plague the industry in deciding future aircraft requirements.

Now, on top of the ongoing adjustments of the economy to a doubling of energy prices (1973 to year-end 1977) with all its ramifications on the airlines, deregulation must be added.

The immediate and direct effects of airline deregulation was to have more carriers, either existing or new, operate on routes with the most traffic. While this could increase the total demand for traffic on a route, in reality it resulted in spreading the existing traffic among more carriers. As each carrier needs a minimum number of flights to be in a market, this produced an increase in frequencies using smaller aircraft (less seats). A mismatch resulted between the existing fleet of larger aircraft and the fleet of smaller aircraft required in a deregulated environment. Thus, the industry was faced with an excess capacity of wide-body aircraft and insufficient capacity of smaller narrow-body aircraft beginning in 1978. With the decrease in domestic traffic (1981 and 1982 RPMs were less than in 1978) this mismatch could continue through 1984.

Another direct impact of deregulation (and also of the depressed traffic conditions) was the ability of new carriers to enter new markets with significantly lower operating costs than existing carriers. The new non-union carriers could enter these markets and establish themselves by offering very low fares. Their low costs were made possible by the pool of pilots, maintenance people and others laid off by the existing carriers due to the recession. The laid-off airline personnel were willing to work at less than union salaries and under work rules that greatly increased their productivity. In addition, surplus used aircraft could be acquired and existing maintenance facilities could be leased at favorable rates. The existing airlines are still operating under union wages and work rules.

The existing carriers, to compete and perhaps drive out the "new" carriers, matched the fares of the new carriers. Lower yields, decreasing traffic, and increased costs resulted in successively greater real operating losses for the trunks beginning in 1979. Thus, the short-term impact of deregulation has been a financial disaster for the trunk airlines. Deregulation, however, came just before the second fuel crisis which resulted in the doubling of jet fuel prices and prolonged economic stagnation (1982 real gross national product is the same as 1979 and 1980).

Up to now the success of airline deregulation depends on the eyes of the beholder. What about the long-term impact of deregulation. As mentioned earlier, it will be to bring airline labor costs under control. The position of organized airline labor has been substantially weakened by competition from non-union airlines, the surplus pool of labor, and the diminished political power of organized labor in general. This will enable the trunk airlines to approach the lower unit costs of the new carriers and stabilize their market shares. Within five years, the excess capacity in the industry will have been eliminated and trunk carriers will have rationalized their fleets to fit the deregulated environment. Trunk carriers will increase their market share, at higher real yields and finally achieve profitability. Obviously, all this depends on the ability of the trunk airlines to achieve unit labor costs close to those of the new carriers whose costs will probably increase. If the trunk carriers cannot achieve this, several of the trunk airlines will cease to exist until a new industry supply/demand equilibrium is achieved.

The long-term impact of a deregulated environment will result in higher prices to the consumer because unit costs will increase. The rational behind this conclusion is the increase in the number of carriers per route in a deregulated environment would prevent the "economy of scale" from working. The difference between the two cost levels - that under a deregulated environment in contrast to that under a regulated environment - are probably not that great in the short run. The periods are defined in terms of aircraft development. Long run is the time required to develop and put into commercial service a new aircraft type or a significant derivative. This is a minimum of five to seven years.

The state of the economy and the development of aircraft technology are probably of greater importance to the future of the airline industry. This leads back to the conclusion that deregulation will result in higher unit operating costs over the long term. The uncertainty of a deregulated environment will impede the development of new improved technology aircraft. In a deregulated environment, and especially one compounded by uncertain future fuel costs, future aircraft payload/range requirements are uncertain, as is airline industry profitability. Both result in uncertain airline launchers of new aircraft programs. The impedance of the development of new technology aircraft will be the lasting legacy of airline deregulation.

A Cast For/Against Airline Regulation

The prior discussion leads one to question what is the case for or against the regulation of airlines as a public utility. First, a brief review is made of the theoretical "textbook" characteristics of a public utility. This is followed by a discussion of airline industry characteristics. A comparison of the degree that actual airline industry characteristics are similar to the theoretical will enable a conclusion to be reached regarding the case for/against deregulation.

The economic basis of a public utility is the concept of a "natural monopoly". An industry is a candidate for public regulation if it is subject to the "economies of scale"; that is "the larger the output of a plant, the lower will be the costs of production per unit". Since this condition exists to some degree in many industries, it is a matter of judgment relating to other factors as well.

An industry suitable for regulation usually is limited as to storage capability. This results in overcapacity most of the year attempting to meet peak demand- period requirements. Overcapacity is aggravated by competition.

A public utility industry usually requires heavy investment in specialized plants which are usually at fixed locations.

The demand for the product of a public utility industry is usually considered to be a basic necessity. Demand for these products tend to be inelastic: as price rises consumers increase expenditures rather than decrease demand. The nature of supply/demand relationships is such that price discrimination or discrimination among customers is both possible and attractive to the producer since:

- Fixed costs are a large share of total costs;
- Unused capacity exists much of the time;
- Significant differences exist in the demands of various customers; and
- Price differentiation (discrimination) may increase revenues and minimize unused capacity.

Finally, in a regulated industry, unit revenues would be fixed at levels to achieve adequate rates of return on investment (ROI) to provide for expansion and new technological development.

The basic characteristics of the airline industry fit the concept of "natural monopoly". It is true that large airlines do not necessarily have lower unit costs than smaller airlines. However, the airline is not the plant. The aircraft is the plant. It is the technical relationships of the aircraft which produce increasing "return to scale" as aircraft become larger. It has been demonstrated by actual operational experience that larger aircraft have lower unit costs than smaller aircraft, even at shorter distances.

There are no inventories in the airlines. Moreover strong time variations in demand exist, not only on a seasonal basis but also on a daily and even hourly basis. Airlines attempting to meet these peak requirements tend to generate periodic oversupply in capacity; i.e., excess capacity in mid-day, or weekends, or in several winter month periods.

While airlines require heavy investment in specialized plant, these plants (aircraft) are movable. They are not, however, as flexible as often claimed. Payload/range differences in aircarft often make them suitable only for specific markets or during certain time periods. Thus, while movable, aircraft cannot be indiscriminantly used in diverse markets.

Demand for air travel is both necessary and discretionary. Most business trips are considered necessary, as are some nonbusiness trips (e.g., emergencies). Business travel represents about one-half the demand and tends to be inelastic. The demand for the other half, composed of personal and vacation travel, tends to be elastic. Another aspect of demand which tends to be monopolistic is that each city pair is a different product. If you have to go to Chicago, a trip to Cleveland can not be a substitute. Moreover, if you have to be in Chicago by noon time, a flight that gets you into Chicago at 5:00 p.m. can not be a substitute. There are types of trips which can be substituted one for the other: a "sun 'n fun" vacation when you don't care exactly where you go. Thus, the airlines' basic products (seats between two points) are not usually homogeneous products: all RPM's are not the same.

The supply/demand relationship in the airline industry are such that price differentiation among customers is used to minimize capacity and increase revenues. Rather than allow a flight to depart with empty seats, additional revenue can be generated by selling the seats at any price above marginal cost.

Air transportation is part of a nation's basic infrastructure. For practical purposes, air travel is the only means of transportation for any trip more than 500 miles. Auto trips longer than this take a full day. There virtually is no long haul intercity rail transportation. Thus, air transportation is vital to the social and business structure of the nation.

While air transportation in the United States was regulated through 1978, it has, historically, earned a very low return on investment (ROI) in absolute terms and relative to other industries. It may be concluded that domestic airline regulation in the United States failed from this aspect, even though it met the objectives of the 1938 Civil Aeronautics Act of developing a safe and efficient national air transportation system. (Tables 15, 16).

Is there a case for regulating airlines as a public utility? In my opinion, there is not a very strong case for or against regulation on strictly "economic" grounds.

The case made against airline regulation was that the lack of price competition produced very inefficient airlines. They competed with one another with either more flights, more space or more frills (e.g., gourmet meals, movies, lounges, etc.) More service (flights) ompetition resulted in excess capacity as evidenced by low load factors and/or low utilization and therefore higher operating costs and higher fares than were warranted. Even so, the airlines did not earn the target return on investment which was set by the Civil Aeronautics Board (CAB) at 10.5 percent.

True the trunk airlines did have very low load factors and very low ROIs between 1968 and 1974 when the wide-body jets were being introduced. However, overcapacity must also be attributed to poor economic conditions, especially between 1965 and 1975. Today's overcapacity is similarly blamed almost entirely on a poor economy (by those who favor deregulation).

The historical pattern of the regulated trunk airlines was not one of consistently low load factors and low ROIs:

Period	Aircraft	Avg. Load Factor	Avg. ROI
1950-1957	Piston	63.5%	10.5%
1957-1961	Phase In - Standard Jet	58.5	4.5
1961-1968	Standard Jet	54.0	7.2
1968-1974	Phase In - Wide-body jet	50.9	3.8

The long-term drop in load factors reflected more than a poor economy. Coincidentally, during the phase-in periods of both jets, there were economic recessions. The long term drop in load factor also reflects the continuing increase in competition among the carriers. This resulted from the CAB's policy of awarding new routes to individual airlines (existing carriers, not new entrants, although more liberal rights were given to charter airlines). Thus, the CAB authorized three or more carriers to operate in many markets, which resulted in overcapacity. Adding more carriers did not necessarily give the passenger much better service as the CAB had hoped. It merely resulted in more

Table 15. U.S. trunk domestic service operations and direct operating costs per ASM (total and by aircraft type - 1982).

	DC-9 30	B737-200	B727-100	B727-200	B707's	DC-8 60/70's	L1011's	DC-10's	B747's	A300's	SUB TOTAL	TOTAL
DIRECT COSTS/ASM												
CREW	1.277¢	1.155¢	1.263¢	0.976¢	1.292¢	0.963¢	0.573¢	0.582¢	0.424¢	0.724¢	–	0.858¢
FUEL	2.609	2.039	2.716	2.341	2.671	2.256	1.878	1.898	1.743	1.863	–	2.212
INSUR/OTHER	0.011	0.012	0.008	0.021	0.010	0.007	0.015	0.018	0.008	0.018	–	0.028
DEPRECIATION	0.241	0.460	0.273	0.438	0.207	0.292	0.514	0.467	0.341	0.560	–	0.418
MAINTENANCE	0.958	0.729	0.758	0.467	1.193	0.607	0.738	0.602	0.518	0.573	–	0.598
TOTAL	5.096¢	4.395¢	5.018¢	4.242¢	5.373¢	4.124¢	3.718¢	3.567¢	3.032¢	3.739¢		4.114¢
OPERATIONAL DATA												
NO. ASM (BILLS)	9.0	6.2	20.7	115.9	4.4	8.3	36.5	44.1	24.9	6.8	275.8	281.4
NO. AIRCRAFT (AVG)	99	61	196	674	40	19	91	125	38	12	1363	1419
NO SEATS (AVG)	95	122	108	144	149	200	288	262	406	242	–	172
AVG. FLT. DIST. (MILES)	406	401	677	639	756	834	1038	1379	2116	816	–	689
UTIL.(BI HRS)	8.15	7.19	7.18	8.94	5.36	7.77	9.21	8.57	10.16	8.82	–	8.44
AVG. GAL/ASM	0.0269	0.0202	0.0279	0.0239	0.0270	0.0227	0.0191	0.0193	0.0176	0.0195	–	0.0222
LOAD FACTOR %	58.6	57.1	59.3	57.6	60.0	59.1	53.7	61.3	68.2	56.2	–	58.9

9:oo a.m. or 5:00 p.m. flights. This produced lower load factors and ROIs. If ROIs were not adequate, fare increases were authorized. This is a major example of poor regulation.

Another major error in regulation had to do with wages and work rules. Organized labor, especially pilots, had monopsonistic powers due to their ability to shut down a carrier's operations, totally. The CAB allowed these increased labor costs to be included in the formula for determining the fare level necessary for the airlines to achieve the 10.5 percent ROI. This goal was rarely met after 1957. If the CAB had not allowed these excessive labor costs to be passed on, airline management might have had more success in moderating unions' demands. In most cases, airline management took the course of least resistance and gave in.

Table 16. U.S. domestic trunk operations: 1953-1982: the economy, traffic, yields, costs and profitability (1979 dollars).

	1953	1958	1969	1973	1975	1979	1982
GNP (BILLS)	$1,019.2	$1,108.5	$1,770.4	$2,042.8	$2,008.3	$2,413.9	$2,411.3
GNP/CAP	$6,387	6,366	8,733	9,639	9,299	10,723	10,391
PSGR REV./RPM	14.73¢	14.01¢	10.53¢	10.09¢	9.59¢	8.37¢	8.63¢
RPM's (BILL)	14.3	24.6	95.6	119.2	123.4	183.5	165.6
ASM's (BILL)	22.1	40.9	182.6	227.3	223.3	289.4	281.4
LOAD FACTOR	64.7%	60.1%	52.4%	52.4%	55.3%	63.4%	58.9%
DOC/ASM	4.956¢	4.479¢	3.112¢	2.843¢	3.152¢	3.171¢	3.094¢
IOC/ASM	4.745	4.235	2.798	2.881	3.029	2.885	2.874
TOC/ASM	9.701	8.714	5.910	5.724	6.181	6.056	5.968
INTEREST EXP/ASM	0.084	0.151	0.222	0.182	0.164	0.136	0.211
TOC INCL INT./ASM	9.785¢	8.865¢	6.132¢	5.906¢	6.345¢	6.192¢	6.179¢
PSGR REV/ASM	9.53¢	8.42¢	5.52¢	5.29¢	5.30¢	5.31¢	5.08¢
OPERATING PROFIT (LOSS) (MILLIONS)	$ 239.8	$ 238.8	$ 602.5	$ 677.9	$ 113.0	$(71.9)	$(649.5)
AVG SEATS/AIRCRAFT	49	59	112	133	142	163	172
AVG BLOCK HOURS/DAY	7.53	7.50	9.14	9.09	8.28	9.72	8.44
AVG FLT DIST (ST MI)	238	305	517	571	582	639	689
AVG GALS/ASM	N.A.	N.A.	0.0366	0.0320	0.0291	0.0260	0.0222

N.A. = NOT AVAILABLE

To support the regulation of airlines, from an economic viewpoint, it must be demonstrated that less-than-optimum performance would result from a nonregulated industry. The following would occur in a nonregulated environment:

> In low-demand city-pair markets, where traffic is not sufficient for more than one carrier, there will be a tendency toward poorer service (fewer flights) and higher fares, relative to high-demand markets. There is, obviously, always the threat of potential competition if the fares become too high. However, monopolistic profits will be made in this type of market, most of the time.
>
> In high-demand, city-pair markets, the large number of carriers will result in the use of smaller aircraft, with more frequencies than required operating at lower load factors and higher unit costs. This would result in either higher fares or loss to the airline if excess competition and capacity generates fare wars.

In today's environemnt there is a surplus pool of labor, facilities, and used aircraft. This has made it relatively easy for new entrant airlines to begin operations with lower operating costs than existing airlines who are burdened with past labor contracts and debts. New entrants have been able to offer very low fares to gain entrance into new markets.

In the future, the pool of surplus labor, excess facilities, and used aircraft will have disappeared. The ease of entry will vanish. Airlines with strong financial resources will be able to acquire the most efficient aircraft, enter any market, increase flights, lower fares and drive out the competitors that do not have strong financial resources. Elimination of carriers will reduce competition, i.e., reduce the number of carriers per city-pair market and result in increasing fares. There is always the potential threat of competition if fares become excessive relative to other markets. However, the elimination of carriers on a city-pair market may lead the remaining fewer carriers to operate larger aircraft with lower unit costs. This would increase their profits and/or enable them to control market share via pricing. The end result will be an industry dominated by few very large carriers with oligopolistic prices, and numerous smaller specialty or local/regional carriers who have carved out a monopolistic niche for themselves. This process could take five or more years.

While some airlines would be winners, the above process would end up with a less than optimum situation for the nation and most passengers, a difficult situation for airport authorities in planning and financing new airport facilities, and a most difficult period for U.S. aircraft manufacturers in developing and launching new programs. This, in turn, would deter new technology and slow down the long term advancement in air transportation.

The case for/against airline regulation boils down to political issues - ideological as well as practical politics.

The development of the United States transportation system has always been supported by public investment. There has been strong historical support for adequate transportation for all regions of the nation, and for fares being related to distance equally in all parts of the nation. This has been U.S. policy since the Interstate Commerce Act of 1887

One trade-off seems to be a willingness to accept long-term, higher airline fares for less government bureaucracy. Another trade-off relates to who reaps the benefits from improved technology. This is more of a political issue than economic. In the past regulated environment, consumers benefited with an improved product at lower prices. However, organized labor received wages higher than they would have received in alternative uses. This was not due to a scarcity of trained labor resources, but more due to a political environment that was pro-union.

Today, there are both surplus trained resources and a political environment that, if not hostile to unions, is indifferent to them. Thus, real wages will be reduced and become closer to those prevailing in other industries. Benefits will probably be split among the consumers, investors/lenders and, if current trends continue, to the sales distribution systems. The cost of promoting and selling has increased significantly in recent years with the addition of new carriers and the proliferation of fares. This will continue in a nonregulated environment. In recent years travel agents have come to dominate this function. It is no longer stretching the imagination to conceive that the air transportation industry will be dominated by outside marketing organizations who will take for themselves the benefits of future technology, in an increasingly unregulated oligopolistic environment.

THE IMPACT OF DEREGULATION ON AIRPLANE SIZE

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Introduction

In the March 1981 edition of Airline Executive, J. S. Murphy, the Editor, in an editorial dealing with Washington International Airport, stated: "What the Federal Aviation Administration, the Congress and the public must understand is that deregulation has changed the role of airports and the United States air transportation is undergoing an equipment revolution that will obsolete the so-called domestic long-range intercontinental airport. The big widebodies that require them will phase out of the picture over the next five to ten years in favor of smaller jets ranging from the 737-300 up to the 767 or A300 Airbus."

What did Murphy mean? Why will there be less need in future for the larger jet when we know from our past experiences that, other factors being equal (i.e., aircraft deployed on the same route networks and developed in the same timeframe from the point of view of technology), small aircraft cost more to operate than larger ones on the basis of cost per available seat mile, they burn more fuel for a given distance per available seat mile, they create more airside delays at airports for a given volume of traffic and they cost more to purchase per installed seat?

In making his statement perhaps Mr. Murphy did not go any deeper than look at the used airplane market today. There are any number of widebodied jets on the market, all sound airplanes, good in fuel consumption and good in operating economics. On the other hand, small aircraft such as the DC-9-30 and the 737-200 are in great demand. Perhaps the answer is deregulation, where more carriers are allowed to compete in the same market for the same traffic - traffic which is not growing and which,