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The Deregulation of the U.S. Airline Passenger Industry: The Response of the Carriers to the First Phase.†

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1. INTRODUCTION

THE AIRLINE DEREGULATION (ADA) of 1978 [1] ended four decades of economic regulation of the airlines by the Civil Aeronautics Board (CAB). Over the following five and a half years the protective entry regulations and the pricing authorization exercised by the Board will be phased out. By 1985 the CAB will no longer exist, nor will there be regulations restricting the entry of carriers or the fares they can charge.

Although substantial reductions in the entry regulations have occurred, the deregulation of air fares will only be completed at the end of 1982. The industry, in fact, is still operating in a transitional period from that of partial regulation to deregulation. The responses of the carriers to these changes can be considered as 'short run' responses to partial deregulation. The responses of the carriers, however, are also affected by the extent and age of their equipment and by changes in the economy which are independent of the changes in regulation. Similarily, the performance of the industry is affected by such factors as the rate of growth in income and the changes in the price of fuel. In order to evaluate the response of the carriers to deregulation, and the effects of these responses on the performance of the industry, observations are needed over a longer period, covering the full span of the industry's cycle.

It is not yet possible, of course, to make such observations. What is possible, is to attempt to discern the response of the carriers to the partial deregulation and to observe the apparent incidence of the economic regulation of the industry as exercised under the 1938 Civil Aeronautics Act (CAA). Put simply, at this early stage we are more able to discern the effects of the former regulations than we are the effects of deregulation. This paper [2] attempts this task and makes tentative observations concerning the effects of the carriers' responses on the structure of the industry.

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2. REGULATION, DEREGULATION AND REREGULATION

The ADA introduces a phased diminution in the economic regulations applied to the air passenger carriers (see Table 1). The timing, however, of the diminution and the removal of particular regulations differs. Entry restrictions will have been removed before the carriers are free from the requirement of having their fares authorized by the CAB. The ADA also introduces regulations. These are primarily aimed at cushioning the perceived adjustment cost incurred as a result of deregulation.

The Small Community Programme restricts the exit of carriers from those routes, which, as a result of the exit, will experience services below a specified "essential" level. The ADA stipulates that "essential air transportation cannot be less than two daily round trips, five days a week, or the level of service actually provided during 1977" [3]. When necessary, the CAB is authorized to provide specific, cost-based subsidies for the service if it cannot be provided without financial assistance.

A simultaneous deregulation of entry and fares is expected to bring forth rapid changes in the routes and the fares. In the case of the formally protected trunk routes, new entrants are expected from the ranks of the intrastate, supplemental and local service carriers. Fare levels are expected to drop, as passengers, like those in the largely unregulated intrastate markets of Texas and California, choose lower quality (comfort and convenience) in return for lower fares. The fare structure and the long run structure of the industry will depend on the economies of carrier scale and the economies of route expansion. If there are no discernable unit cost advantages—or disadvantages—over the observable size range of carriers (economies of carrier scale), and if the economies obtained by acquiring additional routes by the same traffic density as the existing network also appear to be negligible, then the share of the market held by the incumbent carriers will decrease as they shrink in size in the face of newly entered and competing carriers. Fares can be expected to move down to equate with marginal (and average) costs. The extent of the discrimination in the fare structure will diminish as the protection of the carriers from new entrants is removed.

TABLE 1

SUMMARY OF THE FORM AND TIMING OF DEREGULATION AND REGULATION

REGULATION **Entry**	**Form of Deregulation and Regulation**	**Timing**
Automatic Entry Programme	One route certificate granted to interstate carriers. Incumbent carriers allowed to protect one route.	1979, 1980 and 1981.
Dormant Route Authority	Carriers allowed to operate certificates on routes which fail to have a minimum five round trips for 13 out of any 26 week period.	Started October 1979.
Close Door Restrictions	Removes the prohibition on interstate overseas carriers from providing local passenger services.	Started October 1979.
Operating Market Restrictions	The Board removes intermediate-stop restrictions from U.S. Airlines' domestic routes. The first stage removes all long-haul restrictions. The second substitutes one-stop restrictions for all multi-stop and single-plane restrictions. The third stage eliminates all operating restrictions in monopolized and minor markets (less than 7,300 O & D connecting passengers a year).	Completed in four phases: August 1979; December 31, 1979; June 30, 1980; and December 31, 1980.
Entry Deregulation	CAB no longer regulates the entry of carriers into routes.	January 1st, 1983.
Exit		
Small Community Air Service Programme	Essential Air Service defined as at least two round trips daily, Monday to Friday, and a total of two round trips for the remaining two days. Service will have to be sufficient to accomodate up to 40 passengers a day (Monday-Friday) to and from the hub, at a 50 percent load factor.	Communities receiving certificated service or whose service has been suspended on Oct. 24, 1978 will receive essential service for ten years. Communities that have lost air service since July 1968 are to become eligible for the programme after 1980. December 1985 Local Service Subsidy ends. November 1988 Government no longer obligated to set and guarantee essential service nor to provide subsidies.

Air Fares	Unregulated fare zone established. The ceiling set by the standard industry fare level which is adjusted every two months by the Board. Carriers on routes on which they carry 70 percent or more can raise fares five percent above the standard. Carriers operating on routes on which four or more carriers have authority can raise fares by ten per cent. Carriers can reduce fares below the standard industry level by 50 percent without Board approval.	The fare zone started on Oct. 1978 and continued until July 1979. From July 1979 until 1982 the same floor operates, but the upward zone for all routes—save for those in which a carrier serves 70 percent or more—is set at 5 percent above the standard fare.
Commuter Carriers	Joint fares between commuters and scheduled carriers mandated.	Started in 1979 and expected to be phased out by January 1st, 1983.
Fare Deregulation	The Board discontinued its fare regulation.	January 1st, 1983.
Regulation by the Board	CAB is dissolved. The remaining functions to be absorbed by other agencies.	December 31st, 1984.

If there are, say, economies of carrier scale, but limitations to the economies gained from adding routes, then the expectation will be for incumbent carriers to reduce their route networks and concentrate on increasing the flow of traffic over their contracted network. Given such economies of carrier scale, the pricing structure will consist of differentiated fares, reflecting the falling average cost of production over the dense routes. Over time, such an industry is likely to be characterized by an increase in carriers, many specializing in a few routes.

There are, however, three constraints which could act to affect the emergence of the unregulated industry's structure. They are: the timing of the entry and pricing restrictions, the possible difficulty of new entrants being able to enter airports and thirdly the point in the industry's cycle at which the changes in regulation occur.

The ADA introduced, in effect, freedom of entry in the first year. In contrast, although fare flexibility operated, the Board still established the standard fare around which the 'flexibility' operated. The carriers, therefore, were constrained in their competitive behaviour during this initial phase of the deregulation process.

The possibility of the second constraint springs from the fact that many of the certificated carriers have long-term contracts with the airports, and at many of them they constitute the operating committees which allocate the airport slots. The incumbent carriers could use their control over the airport slots to block the entry of competitors. The possibilities of such blockages are greatest at those airports which are already experiencing congestion at peak hours.

The third constraint refers to the industry's re-equipment cycle, for the year of 1978 was one in which the carriers were faced with decisions to replace their aging fleets. Of the turbo jets in operation in 1978, 65 percent were 9 years or older [4]. Furthermore, regulations applied to noise levels effectively passed the 'death sentence' on the older jets. At the end of 1978 the certificated carriers had orders for 393 aircraft, in contrast to the 178 on order at the end of 1974 [5]. The year of the ADA clearly occurred at a time when the carriers were engaged in the re-equipment stage of their cycle. It also occurred during a year in which oil prices rose by 80 percent.

The industry's cycle and the oil price increases were independent of the process of deregulation yet they are likely to have influenced the responses of the carriers. They also raise two questions relevant to the evalation of the first phase of the ADA. To what extent did the freedom resulting from deregulation allow the carriers to increase their productivity and so offset the cost effects of higher oil prices? Did the lack of new aircraft keep the carriers from entering new routes?

3.1 THE RESPONSE OF THE CARRIERS TO THE DEREGULATION OF ENTRY AND THE CHANGES IN EXIT REGULATIONS

Under Section 10 of the ADA all qualified carriers were allowed to apply for unused route authority and for protection of one of their routes each year. The process of allocating the applicants to the dormant routes was on a "first-come-first served basis," a method which resulted in overnight stays by airline representatives outside the CAB headquarters. After the initial rush, the count in mid-1979 showed carriers filed 913 route applications. Of these, 809 were for new authority and 104 were for protection, the latter coming largely from the trunk carriers.

Although most of the outstanding 9,600 dormant city pairs remained in this condition, a number of significant changes took place. Some 20 new carriers received certificates. Many were formally intrastate carriers previously unable to obtain interstate routes under the CAA regulations. As a group, these "new" carriers obtained 78 percent of the routes they requested and accounted for over 33 percent of the awarded new routes (Table 2).

The Big Four (American, Eastern, United and Delta) made 29 percent of their route applications on existing routes, while the locals made only six percent. Most of the new routes were to the growing "sunbelt" of the south and west, from the populous eastern and western centres. By the middle of 1979, however, only 161 city pairs were still receiving service from a new carrier, of which 19 were accounted for by the new entrants. Of the carrier groups, the Big Four and the new entrants, implemented the highest percentages of their acquired routes. In contrast, the locals only implemented six percent of their acquisitions. The percentage figures of implementation [6] for some of the major trunks were: American 61, United 55, Eastern 43, Delta 28, Braniff 29 and Allegheney 18.

It appears, however, that the new entrants captured only a small share of the market. In October 1979 new entrants accounted for only 3.10 percent of the revenue (RPM) produced [7]. In the year ended on October 31, 1979 the domestic scheduled RPMs expanded by 12.7 percent. The largest two trunks' share of the domestic scheduled market had dropped by just under one percent over the first year of the ADA. The share of the six smaller trunks had fallen by 1.5 percent, while the local service carriers' share had risen by 10.4 percent. These figures, however, were affected by the strikes among the large trunks and the locals, the latter occurring in September 1979. Furthermore, data are not available for approximately 300 commuter carriers. These omissions probably account for the shares of the other carrier groups being overstated by around five percent [8].

The trunks can be separated into two groups according to their reactions to the relaxations on entry under the ADA. The Big Four carefully added routes which complemented their route systems. These routes were few in number and the carriers took defensive positions. It is behaviour, in fact, which indicates that under the CAA they had obtained most of the routes they desired to operate. Perhaps the most significant aspect of the ADA for these carriers was their ability to operate without many of the former route restrictions. The smaller trunks were readier to apply for and to operate new routes. The behaviour of the most prominent carrier of this group, Braniff, suggests that its rush to expand was less a reflection on its former inability to obtain routes under the CAA, than a fear that regulation in a more severe form may return [9].

The local trunks also applied for many routes—but many failed to implement those they have been designated. This could be due, as some of them claim [10], to the fact that many of the routes have also been designated to other carriers. The policy of multiple permissive authority is expected to work in this way and, over a longer period, different carriers are expected to enter and leave the routes they have been designated. The former intrastate carriers have been the prominent entrants into the market. Even so, they represented only just over two percent of the services supplied by all the certificated carriers. No actual "new" entrant appeared to have entered the longer and denser routes. Those that entered were at the small community end of the market.

The lack of available equipment is likely to have played a part in the actions of the locals. At the time of deregulation the locals did not operate wide-bodied jets. Collectively they operated 20 three-engine and 295 two-engine turbojets and turbofan aircraft. Alternatively, their orders during this period did not indicate they would be entering competition with the trunks. At the end of 1978 they had on order 100 aircraft: 42 DC-9-30's, 19 Boeing 737's and 17 B727-200's [11]. They also found that the lead time on deliveries were increasing as production reached its limits. This was also the case in the commuter sector, where the new orders in the year of deregulation reached $300 million and the delivery lead time had stretched between one and two years [12].

There were few station or route closures. The trunk carriers closed 35 stations and the locals 87, closures which were far below the numbers predicted by the claimants of the argument that extensive cross-subsidization maintained many unprofitable routes and stations [13]. The CAB in implementing the essential air service programme has defined a level which appears to be close to the threshold at which carriers will enter the market. A number of communities receiving services above this minimum, essential level, appear to have experienced services which are now provided by carriers operating slower and less advanced equipment. Some also appear to be receiving more services to the medium and larger-sized hubs than before. One group that did appear to have suffered reduced services were those centres near the larger hubs. The latter attracted most of the adjusting services, to the detriment of the former.

A statistical summary of the first year of the ADA showed that there was a net loss of 24 single-plane markets between Ocotober 1979 and October 1978. There were 415 new competitive markets in October 1979, and 292 deletions, for a net gain of 123 competitive markets [14].

The structure of the industry is still undergoing change as a result of these responses. Since the passing of the ADA a number of merger proposals have occurred. Of these the Pan American/National merger has obtained CAB approval, and in December 1979, it obtained Presidential assent. The North Central/Southern has occurred, while the Continental/Western was denied. The merger of the former two carriers would appear to indicate the existence of network economies and the efficacy of merging as a means of realizing them. It is nevertheless difficult to use this as a general indicator of the likely developments in the growth of carriers, for growth by internal expansion has also been going on, and carriers have taken the chance to expand and compete on new routes.

3.2 THE RESPONSE OF THE CARRIERS TO THE DEREGULATED FARE ZONE

Within the year of the passing of the ADA, the standard industry fare level was increased on six occasions, pushing up its level by 24 percent. Although the general fare level, as measured by the standard industry fare level, may have dropped in real terms in 1978, it rose in 1979. It would appear, however, that the reason for the increase had little to do with the effects of deregulation. The major cause was the unexpected increase in oil prices. Between July 1978 and July 1979 the average price per gallon for the domestic trunks rose by 52.5 per cent, for local carriers by 50.7 percent [15].

In 1978 fuel costs accounted for 21 percent of domestic scheduled carriers' operating costs, labour for 42 per cent [16]. Assuming little or no substitutes of other inputs for fuel, a 50 percent increase in fuel can be expected to increase costs by 10 percent. Such a rise would require an increase in labour productivity of 23 percent to offset the cost increase.

Calculations made by the Board [17] suggest that from the year end of 1976 to the fourth quarter of 1979 the price of airline inputs rose by 53 percent, while the consumer price index rose by 31 per cent. In order to keep yields at their 1976 levels the carriers productivity would have had to rise by more than 53 percent. They did not, and instead rose by only 32 percent because of increases in productivity.

An examination of the movements of fares and the changes in fare was made by taking 71 short-haul routes of high and medium density which were at least as large as the Dallas—San Antonio route in 1974. This set of routes was used in the U.S. Department of Transportation study (5) which examined the fare differentials between the largely unregulated intrastate routes in Texas and California and the interstate routes regulated by the Board.

In the fall of 1979 carriers on the denser, short-haul routes chose to alter their fare structures rather than to reduce substantially the level of their coach fares. Of the 71 city pairs, only 18 registered coach fares below the standard industry fare level (formula coach fare). By dividing according to route density and distance, a number of interesting results emerged. Taking 250 miles as the point at which the fare curve approximately intersects the "trip cost curve" [18] on non-stop routes, it is expected that carriers on routes below 250 miles will be inclined to maintain or to increase their fares at or around the level of the formula coach fares. At lengths greater than this distance costs are thought to be below the formula coach fares, and so provide the carriers with the possibilities of reducing their fares. Of the routes less than 250 miles in length, 11 registered coach fares below the formula coach fare, 12 increased them above the formula fares and 6 placed them at the coach level. As for the routes greater than 250 miles, only seven registered coach fares below the formula coach fares, 18 were above the formula fares and 17 were at the level of the formula coach fares. If these movements are examined with respect to route density, of the 11 drops in coach fares on routes less than 250 miles, seven were in the top half of the densest routes. All of the seven drops in coach fares on routes exceeding 250 miles were in the top half of the densest routes. Of the 18 increases in fares above the coach formula on routes exceeding 250 miles, 10 were

TABLE 2

DORMANT ROUTE PROGRAMME STATUS AS OF JUNE 15, 1979

	Queue Position	Number of Dormant Routes Nov/Dec '78	Number of Applications for: Existing Routes	New Routes	Status: Denied	Pending	Relinquished	Awarded	Inaugurated	In Service
Domestic Trunks										
American	3	301	4	45	9	7	1	2	4	26
Brantiff	7	109	12	195	78	—	50	20	25	34
Continental	12	133	6	16	9	—	1	3	4	5
Delta	18	488	—	28	17	3	—	—	1	7
Eastern	2	769	22	17	—	—	—	22	—	17
National	—	253	1	1	—	—	—	2	—	—
Northwest	5	301	15	25	3	7	—	7	14	9
Pan Am	—	24	—	—	—	—	—	—	—	—
TWA	8	294	10	39	19	4	10	9	1	6
United	1	915	14	8	—	8	1	1	7	5
Western	43	276	3	1	—	2	—	1	1	—
Total		3,863	87	375	135	31	63	67	57	109
Local Service Carriers										
Allegheny	15	731	—	71	28	1	22	7	9	4
Frontier (1)	11	48	1	11	5	3	—	3	—	1
Hughes Airwest	9	789	7	36	9	—	11	12	—	—
North Central	4	2,008	—	28	5	—	10	3	—	10
Ozark	16	659	—	18	7	—	—	11	—	—
Piedmont	20	826	4	20	8	2	—	6	4	4
Southern	—	331	—	6	3	3	—	—	—	—
Texas Int'l.	21	414	—	7	2	1	—	3	1	1
Total		5,808	12	197	67	10	43	45	14	30

Regional Carriers										
Air New England	27	12	1	—	—	—	—	1	—	—
Alaska Airlines	—	—	—	2	1	—	—	1	—	—
Hawaiian	22	—	—	11	11	—	—	—	—	—
Wright	14	—	4	14	9	—	—	5	1	3
Total		12	5	27	21	0	0	7	1	3
Total Certificated Carriers		9,683	103	586	223	41	106	119	72	142
New Entrants										
Air California	19	—	—	7	1	—	—	1	5	—
Air Florida	10	—	—	23	3	12	—	2	6	—
Altair	13	—	—	36	3	—	1	3	26	3
Big Sky	—	—	—	5	—	—	—	—	5	—
Colgan Airways	—	—	—	1	—	—	—	1	—	—
Federal Express	—	—	—	2	—	—	2	—	—	—
Golden West	28	—	—	19	2	—	—	9	1	7
Pacific Southwest	6	—	—	8	5	—	—	1	—	2
Southwest	17	—	—	9	4	—	—	4	—	1
Swift Aire Lines	30	—	—	4	—	—	—	—	—	4
Aeroamerica	—	—	—	33	9	—	—	24	—	—
AeroMech	—	—	—	2	—	2	—	—	—	—
Apollo	—	—	—	13	3	—	—	4	6	—
Cochise	—	—	—	2	2	—	—	—	—	—
Empire	—	—	—	9	—	—	1	—	8	8
Imperial	—	—	—	5	1	—	—	—	2	2
Mississippi Valley	—	—	—	18	2	7	—	6	3	—
SkyWest	23	—	—	3	3	—	—	—	—	—
Southwest	—	—	—	7	3	3	—	1	—	—
Coleman	—	—	—	4	—	—	—	4	—	—
Total		0	0	210	41	24	4	60	62	19
Total All Carriers		9,683	104	809	264	65	110	179	134	161

Note: (1) Incomplete listing. True number of dormant routes should be in the approximate range of the other carriers.

Source: B.L. Beyer: "Standing in Line: Was It Worth It? **Air Transport World,** August 1979.

in the bottom half of the routes ranked according to density.

The fare reductions that have taken place have been in the form of special discount and excursion fares and have been most substantial during off-peak hours. Although many fares fell as low as 45 and 50 percent below the coach fares, most of them were limited to a specified number of seats. The lowest off-peak fares showed that night coach fares averaged 80 to 84 percent of coach fares.

This closer examination of the short-haul denser routes suggests that carriers chose not reduce their coach fares on these high cost routes below the rates determined by the coach formula. Of the 18 reductions out of the 71 routes examined, six were in the former unregulated intrastate routes [19]. The fare reductions occurred on the off-peak fares and on the discount excursion fares. The peak/off peak structure developed such that off-peak fares were ranging between 50 to 80 percent of the lowest coach fares. Estimates of the actual percentage of travellers using the discount fares on these particular 71 routes were not available. According to the average for all trunks and locals, over routes of 200 to 300 miles in length, 22 percent of passengers travelled on discount fares [20].

The dense, long-haul markets with a high potential for transporting non-business travellers were expected to experience the largest drops in fares. Nine long-haul routes were chosen for examination because of their high proportion of non-business travel.

On these long-haul routes carriers have chosen to place their coach fares close to the formula fares, even though at such distances and traffic densities operating costs are expected to be substantially below the formula fares. The drops in fares took place in the off-peak fares. Night coach fares were around 80 percent of the coach fares, while the super coach were less than 50 percent of the coach fares. Nevertheless, these fares reflect a movement away from the "deep discounts" offered in 1977 and 1978. On these particular routes, however, the majority of passengers travel on the discount fares. For the first time, in the third quarter of 1978, trunks carried more passengers travelling on discount tickets than they did on full fares.

In general, the response of the trunk carriers to the decreasing regulation of fares has been to experiment with discount fares rather than taking the opportunity to lower coach fares. The characteristics of the discounts have been their depth—between 30 to 50 percent of coach fares—and the controls on their capacity which limits them usually to 30 percent of the aircraft's seats. The effect of these deep discounts has been to lower yields, and in effect to lower the average price of air travel. In real terms, the average yield on the domestic trunks fell from 4.54 cents to 4.14 cents, a drop of 8.8 percent [21]. This was the largest drop in real yields over the period 1955 to the present, and contrasted with 1979, when they rose. The net profit on domestic trunks rose to $748 million in 1978, up from $421 million in 1977 [22].

4. SUMMARY

The passing of the first year of the ADA allows a number of observations concerning the incidence of the regulations operated by the CAB prior to 1978. Perhaps the most striking indication of the incidence of these regulations has been that the trunk carriers have not dropped, as some had predicted, a large number of routes from their networks. Those routes that have been dropped have found other carriers ready to provide services. Some of these services have been in aircraft of a less advanced technology. Such substitutes have been more frequent where the commuter carriers have replaced the routes vacated by the local carriers. Indeed, most of the movement of carriers in and out of routes have been on those serving the smaller centres. Such movement suggests the former entry and exit regulation on the local routes, and the policies of subsidization, were serving to allocate aircraft and carrier types to routes which were inappropiate to their capabilities.

There is, however, a reverse side to the fact that the trunk carriers have dropped few routes from their networks. With the exception of Braniff, the trunk carriers have entered only a few new routes. Such behaviour suggests the operation of the CAA by the CAB did not unduly restrict the "grandfather" trunks and their descendents from entering and competing on routes they desired. The movement of carriers into routes serving the "sunbelt," however, suggests the trunks had been slow to adjust to the shift in the location of the growth of the nation during the seventies.

As for the efficacy of the Board's policy of protecting these trunks from direct competition on their scheduled routes, it would appear that it has nurtured eleven, sturdy carriers. Although the figures have been affected by unexpected strikes, the share of the traffic on the domestic scheduled routes operated by new entrants has been very small. The local carriers have shown their intentions of entering and competing on trunk routes, but they have been less forthcoming in actually entering. One reason is possibly because the carriers did not have the equipment to enter these routes. The first year of deregulation occurred when most carriers were operating aging fleets. Of perhaps more immediate importance, has been the Board's policy of granting multiple authorizations on many routes. It appears to have caused carriers, and particularly carriers new to the trunk system, to reconsider whether there would be adequate returns from competing. It is interesting to note, for instance, that Midway Airlines started operating out of Chicago's Midway Airport with DC-9s in September 1979. This has been the only carrier, out of the dozen which were awarded rights in the landmark case of July 1978 [23], to have actually started operating.

The new entrants into the industry, perhaps not unexpectedly, have moved into the routes serving the small communities. The small sums [24] so far spent on subsidizing carriers to operate at the level of "essential" services indicate that the ADA correctly defined the threshold of entry into these routes as being low. At this broad base of the industry, carriers have left and entered routes. In contrast, no "brand-new" carriers have been formed and entered into the scheduled routes. Instead, on these routes there has been the existence of the threat of entry rather than the actual widespread entry of competing carriers.

While the threat of entry can have a powerful effect on the behaviour of the incumbent carriers, the lack of actual new entrants generates questions. It becomes important to know whether the potential restrictions to new carriers at airports have actually operated against their entry into routes. How substantial were the inherited advantages of the formerly protected carriers?

The evidence from the "short run" is that carriers wishing to use new airports in order to compete on new routes have not found undue restrictions [25]. Where new carriers have found difficulties in obtaining slots it appears that the primary reason has been due to airport congestion, rather than due to restrictions imposed by incumbent carriers. There is no powerful evidence, however, to suggest such difficulties have substantially reduced the threat of new entrants.

The effect of the advantages enjoyed by the incumbent carriers over new carriers is difficult to establish. We can observe only the short-run changes. In that time the fares on many routes have developed a marked, two-tiered structure, with the higher tier pushing close to the standard fare set by the Board, and the lower fare pitched at substantially lower levels, and often set to attract the non-business traveller. In view of the average financial performance of the carriers, the intense competition at this fare level that has gone on and the high share of passengers travelling on discount fares, there is reason to believe that non-business passengers travelling on the lower tiered fares did not pay less than marginal costs for their services. If such fares were lower than marginal costs, then it is likely the financial performance of the carriers would have been far worse. Alternatively, if all fares were at the lower tier, it is likely they would have incurred heavy losses. In short, the marginal costs of producing services on many routes appear to be substantially below the average costs of producing such services. In such cases it would seem that there are economies of carrier scale.

If the carriers enjoyed market power as a result of their former protection and if there were no economies of scale, then the entry of competitors would see the diminution of the difference between the fares until they become one fare, equal to marginal and average costs. This does not appear to be happening on many routes. Indeed, the fact that many carriers are pushing up to the fare ceiling with their upper tier fares suggests that the Board is constraining their pricing strategies. Given the existing threat of entry, it appears that the discriminatory pricing structure will exist into the long run [26], for it represents the economies of scale on many routes rather than the exercise of market power inherited from protective regulation. The existence of such economies of scale, however, does not necessarily imply that they will represent a substantial barrier to entry.

The first year of the ADA was an exceptional one. The growth in traffic was substantially greater than the trend of the last two decades [27] while high utilization and productivity increases were registered [28]. There is reason to believe that the increases in utilization represented not only the rapid, exogenously determined growth of that year, but also the gains in efficiency of an industry in which carriers were aligning their equipment and setting their fares in markets where they were previously constrained by regulations. They have also been constrained by the lack of adequate equipment. This should change over the next few years. It remains to be seen, however, whether these gains in efficiency will be sustained over the full cycle of the industry. It will also be interesting to observe the reaction of the carriers if the economy makes its predicted downturn. It is unlikely they will request protective regulation, but like many other industries, they may request indirect financial assistance from the government.

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6. This is measured by taking the number in service and inaugurated, and then dividing by the number of existing and new routes applied for.
7. CAB [1] Nov. 1979, Table E-3. It must be emphasised, however, that these figures have been influenced by the strike at United and the grounding of the DC-10. The latter involved the grounding of almost 24 percent of the U.S. domestic fleet for eight weeks (March 31-May 28, 1979).
8. CAB [2] Nov. 1979, page 14.
9. See A. Stuart: "Braniff's Dizzying Take-Off into Deregulated Skies." *Fortune Magazine,* March 26, 1979. It could also be that Braniff simply made a miscalculation.
10. See James P. Woolsey: "Republic is trying to prove one plus one is more than two," *Air Transport World,* October 1979.
11. *Handbook of Airline Statistics. Supplement.* Calendar Year 1977 and 1978. CAB. December 1979.
12. *Commuter Airline Industry. 1979 Annual Report,* page 83.
13. At the *Oversight Hearings of the Civil Aeronautics Board Practices and Procedures, Subcommittee on Administrative Practices and Procedure;* Feb., March 1975, it was initially claimed that Eastern had 327 "losing" city pairs. This list was then cut down to 29 route segments which were 'susceptible' to loss of service. A year after the passing of the ADA, Eastern had dropped only 8 stations. In 1975 these were estimated to involve 15 unprofitable segments and five profitable segments. See McAvoy and Snow [4], and CAB [1], July 1979, Table A-6.
14. CAB [1] November 1979, Table A-7.
15. CAB: *Fuel Oil and Consumption,* July 1979.
16. Air Transport Association of America, *Annual Report* 1978.
17. An internal study, conducted by the Director, Office of Economic Analysis, dated January 23, 1980.
18. "The fare curve intersects the trip basis cost curve somewhere between 500 and 700 miles; it intersects the non-stop cost curve at approximately 250 miles." Statement of General Policy. Domestic Passenger-Fare Level Policies. CAB Regulation PS-30, footnote 71, page 39528. *Federal Register* Vol. 43, No. 172, Tuesday, Sept. 5, 1978.
19. It is interesting to note, however, the reductions in the difference of fare levels between the former unregulated intrastate carriers and regulated carriers. The changes in fare regulations have meant the fare differences between the Dallas-Houston route and ten former unregulated but similar routes have diminished.
20. CAB [1] July 1979, Table E-5.
21. CAB [1], July 1979.
22. *Air Transport Association of America. Annual Report* 1978.
23. Chicago-Midway Low Fare Route, July 1978. This was a significant decision, for in effect the Board opened up the trunk routes to new entrants. It appears to have frightened the trunks, even though it took 15 months for a new carrier to actually enter.
24. The subsidies incurred in 1979 to implement section 419 of the ADA totaled $507,000. This is projected to rise to $9,400,000 in 1980. The total subsidies, including subsidies to local service carriers and regional was $72,900,000 in 1979. They are estimated to rise to $95,769,000 in 1980. *Budget Estimates, Fiscal year 1981,* CAB.
25. There has been a case, in San Diego, where an airport in trying to impose restrictions on noise levels, had discriminated against new entrants. This ceased after the FAA pointed out that this was in violation of the FAA's prohibition against the granting of exclusive rights by airports receiving federal funds.
26. In considering the long run, the changes in fares and quality of service also have to be considered. As Douglas and Miller [2] have shown, at equilibrium, the quality of service, as measured by the expected schedule delay, adjusted to the fare level authorized by the Board. On routes with relatively high fares, equilibrium was characterized by a high number of scheduled frequences and low load factors. In contrast, on routes with low fares, equilibrium was characterized by high load factors and greater expected schedule delays. They suggested that the Board had set levels of fares, and indirectly quality, which were significantly above the levels of service combinations estimated to be desired by passengers. After a consideration of the early movements of the load factors and price levels, it is tentatively suggested in Ellison [3] that the levels of fares on domestic routes since deregulation approximate more closely to passengers' desired combination of price and quality.

27. The growth in the revenue passenger miles of the total U.S. scheduled domestic market reached 17.3 percent in 1978. This was the third highest annual growth in the last two decades. The schedule carriers registered a return of 13 percent on investment and load factors of over 60 percent. The latter was the highest in the last two decades. The performance of 1978 was not maintained in 1979. Growth, load factors and the return on investment were all down below the records set in 1978.

28. See CAB [1] July 1979, page 18.

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(2) Douglas, George W. and James C. Miller III: *Economic Regulation of Domestic Air Transport, Theory and Policy*. The Brookings Institution, Washington, D.C., 1974.

(3) Ellison, Anthony P., *Deregulation: The U.S. Experience*. In process, the Regulation Reference, Economic Council of Canada.

(4) MacAvoy, Paul W. and John W. Snow (eds.): *Regulation of Passenger Fares and Competition Among the Airlines*. American Enterprise Institute for Public Policy Research, Washington, D.C., 1977.

(5) U.S. Department of Transportation: *An Analysis of the Instrastate Air Carrier Regulatory Forum:* Vol. I/Summary Report. DOT-OS-60078. Jan. 1976.