COMMUNICATIONS FORUM

"Deregulation: A Comparative Assessment of the Airline and Telephone Experience"

April 16, 1992

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Seminar Notes

Prof. Richard Caves, Economics Department, Harvard University

Prof. Jerry Hausman, Economics Department, MIT

Prof. Steven Morrison, Economics Department, Northeastern University

Mr. Robert Skinner, Transportation Research Board, National Research Council

Prof. Peter Temin, Economics Department, MIT

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Prof. Peter Temin, of the MIT Department of Economics, moderated today's seminar. He opened the seminar by emphasizing the comparative perspective of today's seminar. In thinking about the deregulation (if that's the right phrases to use) in the industrial structure and the regulatory structure of telecommunications, we thought it might be interesting to compare these with another industry that has recently undergone changes. So, two of today's speakers will discuss changes in the last decade or so in the airline industry, and then we'll have two speakers on the telecommunications industry. The connections will be apparent, just by the juxtaposition of all of this, but we hope that the speakers on telecommunications will reflect on what they've learned about the airlines in an attempt to draw some comparative conclusions.

Temin observed that one of the most interesting aspects of the various episodes of deregulation across industries is the unexpected quality of them. At the time that one debates whether to change structures, one has a whole set of scenarios about what will happen. In these cases, beyond 1980s, the scenarios were all about the wonders of competition. The image was about how the industries, both of them, could resemble something like your corner drugstore. Of course, that did not happen and we'll talk about why that did not occur.

The first speaker was Mr. Robert Skinner, Director of Special Projects on the Transportation Research Board of the National Research Council. Skinner's talk was based on the results of a study by the Transportation Research Board, which looked at the changes in domestic air transportation since deregulation. His aim was to discuss what the implications of these changes might be for deregulation in general, and to speculate with the other panelists about the possible correspondence with telecommunications.

Skinner explained that the Transportation Research Board is one of the major units of the National Research Council which, in turn, is the operating arm of the National Academies of Science and Engineering. These were originally chartered by Congress in the 1860s to provide government with independent scientific and technical advice; the groups are non-profit, private organizations. The study product that was the subject of the talk was produced by a Committee, as are all National Research Council activities. This Study Committee was a panel that included experts in economics and management, with particular expertise in airline and airport operations. The panel included technologists with expertise in air traffic control systems and aircraft maintenance and operations. The panel was chaired by Dr. Joel Fleischman, who is the Senior Vice President at Duke University and the former head of the university's School of Public Policy.

There are two views of aviation that have been articulated over the past decade. According to Skinner, one of these views, which is more prevalent in the media, is "the frenzied skies version." This talks about higher and irrational fares, concern over bankruptcies, and fear of the erosion of safety because of careless maintenance and operating practices. Another view is one that we hear less often, which stresses the lower average fares that may have resulted, better service options, and a safety record that has been pretty much maintained intact. The National Research Council felt that, after ten years of experience with deregulation and a considerable foundation of independent studies, that the time was ripe for a comprehensive assessment of the changes over the past decade.

The National Research Council began its study with support from the Sloan Foundation the NRC Fund, a pool of private, discretionary funds available to support NRC-initiated public policy studies. The Council looked at impacts in a couple of different categories, termed "private impacts" and "public sector impacts." The private impacts included effects on carrier management and financing, effects on consumers (principally through fares and flight frequencies), and the changes in the nature of air carrier competition. In the public sector, we looked at the impacts on safety, on the provision of airport and airway capacity, and the ability of the Federal Aviation Administration to respond in the new, deregulated environment.

Skinner offered a summary review of the background to the deregulation of air carrier service. First, the overall rationale for economic regulation of the aviation industry was threefold: (1) an economic rationale that, if there was unrestrained and unregulated competition, this would lead to unregulated monopolies and all of the negative effects for consumers that such monopolies

would entail; (2) a social rationale, that without regulation we wouldn't have the adequate service to small, rural communities that are necessary for the social and economic vitality of the country; and (3) a safety rationale, that if there were unregulated competition, we would find airlines cutting corners on their operating and maintenance practices, and inevitably this would lead to a compromise in safety.

In 1938, the Civil Aeronautics Administration was established, and two years later it was re-established as the Civil Aeronautics Board (CAB). They regulated market entry, routes, and fares. By the 1970s, however, a substantial body of academic literature had been published which laid the groundwork for deregulating the market. The arguments were that deregulation would lower fares and would lead to more choices; that the ease of entry into the marketplace was sufficiently low that the markets would be contestable; and that the threat of contestability would discipline prices in the market. In 1975, the CAB began administrative deregulation, allowing more competition in routes and allowing some discounted fares. In 1978, the Airline Deregulation Act effectively ended airline regulation. Of course, we've had a fairly turbulent time in the aviation business since then. There certainly have been a variety of other factors that have had a role to play in this - e.g. the energy crisis in 1979, the Air Traffic Controllers Strike in 1981, the recession of the early 1980s, and the Persian Gulf War at the end of the 1980s-early 1990s, and the current recession.

Using overhead slides, Skinner summarized the key results and findings of the study. We see that there was substantial traffic growth during the period in question (Slide 1), and although the growth can't be attributed entirely to deregulation, deregulation played an important role. In terms of the economic condition of the airline industry, it is precarious both before and after deregulation (Slide 2). There has been substantial evidence of productivity improvements in the industry (Slide 3), and these improvements can be attributed to deregulation (e.g. improved equipment utilization and lower labor costs). Fares have fallen, and real fares have dropped by about 20 percent during the period (Slide 4). In terms of service frequencies, these have increased, even in the rural communities with which we were particularly concerned (Slide 5). Despite the recent trends towards increased concentration in the industry, overall we have more choices today than we had in the past in terms of different airlines. For example, today the number of city pairs that have three or more airlines is forty percent (versus twenty percent prior to deregulation). The extent of competition in city pair markets, organized by distance, shows that the longer markets have increased competition (Slide 6). This is basically because of the hub-and-spoke network system adopted by most airlines. This allows a number of carriers to compete for the longer distance trips. In addition to the hub-and-spoke system, we have seen a variety of other changes in the way airlines do business. We've seen them adopt fairly complex fare structures, although there has been substantial discussion over the past couple of weeks about simplifying the fare structures. Nonetheless, fare structures remain more complicated than they were before deregulation.

We've also seen airlines, if not adopt for the first time, certainly accelerate the use of a variety of marketing strategies such as "code sharing arrangements" with commuter airlines. In code sharing, the commuter airline adopts the codes, or the flight numbers, of a major carrier. So, when you book a flight with a commuter airline, you get the sense that you're travelling with a major carrier. We've also seen an increase in the importance of frequent flier programs as a marketing strategy. Computer reservation systems are also increasingly important in this era of deregulation, as are commission overrides (essentially, incentive bonuses given to travel agents who book more flights on a specific airline during a given period of time).

Our study expected, at this point in time, to see greater concentration. We complete our work about a year ago and, since that time, we've lost PanAm, so we were correct in our observation. Our Committee believed that as long as there were three competitors in a market, that would be adequate to discipline prices. On balance, we felt that if we could end up with five or six major carriers and a couple of mid-size players, that would be enough to maintain discipline in prices.

According to Skinner, safety was one of the great concerns related to deregulation (Slide 7). The accident records for commuter and major airlines show a continuation in the same sort of pre-deregulation trends after deregulation. We are seeing, statistically at least, constant improvements in safety. There are some reasons for concern, however. We are concerned about the ability of the Federal Aviation Administration to adequately monitor safety and to conduct inspections. The Eastern Airline problem with maintenance violations shortly before they went bankrupt is illustrative of the kinds of concerns we have. Also, we've seen increased reliance on commuter operators in the network and increased service by commuters. The safety standards that apply to commuter carriers are less stringent than those that apply to major carriers.

The final area of the impact of deregulation discussed by Skinner was airports and airway capacity. The flexibility that we've seen on the part of air carriers to develop wholly new ways of business under deregulation has not been matched by flexibility on the part of government. Government plays a critical role in the aviation industry, in that the federal government provides the air traffic control system and the state and local governments provide capacity at airports, improvements to existing airports, and new airports. We found that the Federal Aviation Administration has had difficulty in maintaining adequate staffing for its Air Traffic Control System and in introducing the new technology necessary to address the new demands we are seeing. We are seeing substantial growth in passenger traffic, and the hub-and-spoke networks place some very difficult stresses on the aviation system. At hub airports, we're trying to have lots of aircraft land and take off at the same time, but this is a stressful situation for the network and has placed demands on the network that didn't exist before deregulation.

According to Skinner, the Committee made several recommendations concerning deregulation. In the area of trying to do what we can now to preserve existing competition, several measures were suggested. One is to urge the Department of Justice to be aggressive in its anti-trust monitoring and actions, essentially opposing any further parallel mergers or acquisitions. There is a need for vigilance in this area, and there are concerns about the availability of airport capacity, which is controlled in part by the airport authorities and in part by airlines that have lease arrangements giving them effective control over gates and landing slots. The Committee also recommended that the travel agents who now have exclusive use agreements on computer reservation systems be allowed to use their equipment to connect to multiple computer reservation systems, so that they won't be captive to one system or another. The Committee also recommended that travel agents be required to disclose the commission overrides that they receive from the airlines. In the area of safety, we recommended increased staffing on the part of the FAA, increased safety oversight in terms of inspections, and narrowing the differences between safety standards for commuter operators and those for major carriers. In the area of capacity, we believed that the FAA should encourage more experimentation with congestion pricing in airports to make more efficient use of existing capacity, and that the FAA should conduct additional research in simulation modeling of network operations, in order to figure out more efficient ways to manage the air traffic control system. Finally, the Committee addressed the question of the institutional home of the Federal Aviation Administration. Fundamentally, the problem is that, as an agency of the federal government, the FAA is subject to a number of forces that make it a comparatively slow and ineffective participant in the aviation system - it has unreliable funding; it has a variety of restrictions on its personnel policies, which keep it from moving air traffic control people around and from recruiting people to live and work in high cost urban areas (which tend to be the areas with the most troublesome air traffic control problems); it has cumbersome procurement policies; and the FAA administrators, typically, have a very short tenure. The Committee believed that a solution to these problems is to move the FAA to some sort of public or private corporation, where it would have added flexibility to address the aforementioned problems, and that the Congress should convene a special commission to decide on which of those two forms (public or private corporation) is most advantageous.

In thinking about the above history of deregulation of the airline industry, Skinner noted several important lessons. First, in the case of a complex industry such as aviation, which has

grown up in a regulated era, when you deregulate it, it will be difficult to predict all the consequences. It's fair to say that we underestimated the potential for innovations in management and marketing practices by the airlines, which affect competition. There have been a variety of unanticipated outcomes. These include the pivotal role of the hub-and-spoke systems in airline operations; the hub dominance by a single carrier (with the exception of Dallas, Denver, and Chicago, each of which has two major carriers using it as a hub) and the impact on fare prices; and the need to adapt government to this new, deregulated environment, in such areas as providing infrastructure and safety responsibility.

The next speaker was Prof. Steven Morrison, from the Economics Department at Northeastern University. Morrison referenced Skinner's point about two views regarding the evolution of the airline industry under deregulation, one being the popular or newspaper view, the other being the more academic view. Morrison observed that one finds from many of the primary critics of deregulation is that they rely heavily on anecdotal evidence to support their arguments. Morrison's talk was based on the results from a data analysis on deregulation, and he noted that his results would parallel what Skinner presented. Morrison's data comes from research he has being doing with a colleague at the Brookings Institute.

According to Morrison, critics of airline deregulation speak often of the increasing concentration in the industry. What this means is the percent of the national market controlled by a certain number of airlines. Using overheads, Morrison showed that concentration levels declined until the merger wave, and that today we have approximately ninety-two percent of domestic passenger miles controlled by the largest eight airlines. This is the picture that one gets from newspaper accounts.

The problem with the above picture, in Morrison's view, is that there really is no such thing as a national market. The markets for air transportation are the individual city pairs and, there, paralleling the slide that Skinner showed, you see a different picture than the newspaper accounts. One does not see an increase in concentration, if you adjust for unequal market shares. At the route level, we have almost as much competition today as there ever was before deregulation. Although there are fewer carriers nationwide, those carriers are meeting each other at the route level more frequently.

Another way of looking at the issue is to look at the percentage of passengers flying on carriers whose market share on that route is less than twenty percent. We could call that competitive carriers. There has been a dramatic increase of the number of passengers flying on carriers that we could call competitive, in the deregulated environment. Similarly, there has been a dramatic decrease in the percent of passengers flying on near-monopoly carriers.

The interest in industry concentration is related to the fact that we think that has some influence on the behavior of carriers and, more specifically, on fares. We can look at the effects of deregulation on fares. Again, Morrison remarked that his results corroborated those of Skinner. Airline yield (revenue per passenger mile) adjusted for inflation shows a downward trend before deregulation, and a continuation of this trend after deregulation. Critics and advocates of deregulation do not disagree about where fares are today relative to where they used to be - they are lower, on average, compared to where they used to be before deregulation. The debate centers on critics' contention that, under a regulated industry, fares would be even lower than they are at present. Morrison's data, comparing actual yields with a formula for where fares would be today under a regulated industry, shows that the regulated yield is always higher than actual yields, thereby disproving the argument of those critics of deregulation. Fares are about twenty percent lower, by his estimates, than they would have been if regulation had continued.

There have been fundamental changes in fares, including a greater array of fares after deregulation. Looking at the dispersion of fares around each route's average, Morrison claimed that fare dispersion was relatively tight in the fourth quarter of 1978; in 1984, the distribution of fares was more dispersed and, in the fourth quarter of 1990, fares were even more dispersed. So, we see a greater dispersion of fares after deregulation. Part of that trend is because fares more accurately reflect costs. Some of it reflects price discrimination.

In addition to the greater dispersion in fare structure, Morrison looked at how real fares have changed by distant. Short-haul fares have gone up, and long-haul fares have gone down. This is a fully expected result of deregulation, because airlines previously had been artificially setting fares in the opposite direction.

On the basis of fares, there are winners and losers in deregulation. For 1989, what we see is that 60 percent of passengers are paying fares lower than they would have payed under deregulation, and 30 percent are paying higher fares than they would have payed without deregulation. On a passenger mile basis, we see that over 70 percent of passenger miles are being flown at lower fares than would have been the case under regulation.

According to Morrison, another big issue surrounding airline deregulation has been the hub-and-spoke system. Airline networks changed with deregulation. In terms of the composition of connecting passengers, about half of the connecting passengers were also changing airlines. After deregulation, the total amount of connecting passengers has risen but the nature of the plane changes is different - more of these people are on the same airlines, which is much less of a logistics problem than changing airlines was. Along with the idea of single-carrier, on-line connections comes the issue of hubs and concentrated hubs. Morrison's numbers agreed with Skinner's data.

The General Accounting Office Study of 1990 said that fares at fifteen concentrated hubs (where one or two carriers control the large share of the traffic) were twenty-seven percent higher than fares at thirty-eight unconcentrated airports. Unfortunately, the GAO was comparing apples and oranges. They didn't adjust fare differences. One of the big reasons why fares differ from route to route and from airport to airport is because of differences in miles travel. Fares per mile decline as numbers of miles increase. Hubs, by their nature, have shorter flight segments that non-hubs
in terms of fares and deregulation, short-haul travellers are paying higher fares. That by itself would make fares per mile look higher at hubs than at non-hubs. Hubs, by their nature, have a greater fraction of travellers travelling on single-coupon tickets (making no connections), which are more expensive for any given distance than are multiple-coupon tickets because airlines price the connecting price lower in order to get people to take them in lieu of the non-stop flights. The GAO made no corrections for these factors. Morrison's data corrects for these factors, and shows that the hub premium today is on the order of about five percent.

With regard to service quality, Morrison made several observations. One aspect of service quality is how easy it is to get a seat and how many people are sitting around you on the plane. That has increased from the mid-fifties to the low sixties (in percentage terms) with deregulation. Since deregulation, not only are there more seats filled but there are also more seats per plane. The load factor to distance relationship shows that, in general, load factors rise with distance. But load factors for short-haul routes have fallen since deregulation and load factors for long-haul routes have risen since deregulation; that trend is perfectly consistent with trends in fares since deregulation.

Morrison summarized by noting that one can always come up with anecdotes to support the criticisms of deregulation but that a more detailed analysis of the data shows another view. He acknowledged that there have been both winners and losers because of deregulation. He contended, however, that the gains to the winners have far exceeded the losses to the losers, so that there has been a net gain because of deregulation.

The next speaker was Prof. Jerry Hausman, from the Economics Department at MIT. Hausman noted that he would forego the history of deregulation (or, lessened regulation, as he put it) in the communications industry. He focused on the question of how to decide whether deregulation has been a good or a bad thing for the transportation and communications industry. There are all sorts of factors that must be considered - safety, convenience, efficiency, etc. Hausman used revealed preference theory to examine this question of winners and losers. Basically, people buy more when the price goes down (demand curves slope downwards) and, although the aforementioned other factors that must be considered, these are all reflected in something called the virtual price - this looks at the output and says that, holding other things

equal, people buy more when the price is less. In terms of the airlines, Hausman argued that there has been a vast increase in demand since deregulation. This implies, in his view, that there are some second order problems in terms of price discrimination, but to a first order of approximation, an output increase demonstrates that society has been made better off. Hausman argued that, with respect to telecommunications, price discrimination hasn't changed enough to worry about it and, in terms of overall benefits to society, deregulation has been a good thing.

With respect to the losers from deregulation, there have been some. Hausman said that the way to think about this is that the government should not be trying to redistribute income through telecommunications prices. So overall, society has been made better off. We should look at this from an aggregate basis. In both airlines and telecommunications, we have had enormous output increases. So no matter how you control for what was happening before or for what would have happened if regulation had continued, Hausman maintained that there is no doubt the social welfare or economic efficiency has greatly increased.

Applying his claims to telecommunications, Hausman began by looking at long distance. There are two flavors of long distance. One flavor, controlled by the FCC, is interstate; these are the good guys in the story. The other flavor of long distance is within a state, and there are actually two types of this; one is interLATA and the other is intraLATA. In the latter flavor, some state regulators wear grey hats and others wear black hats.

What has happened in long distance? If you compare 1980 to 1984 and 1984 to 1990, what you find is that long distance growth was about four percent higher per year in the latter period. So, we've had this much higher rate of growth of output, which demonstrates that things have gone the right way. An additional rate of growth of four percent per year implies a doubling of output every eighteen years.

What about prices? Prices in long distance have come down by thirty-five percent in real terms during the same period as considered above. But, here we are a little hamstrung by the data. We can get prices for residential and small business lines much more easily than for large businesses. It is interesting to note that for the small business and residential group, while prices have come down by thirty-five percent in real terms, that has not been because of competition but because of a regulatory transfer. Local prices have gone up, but the access prices which long distance providers pay to local carriers (and, of course, which consumers pay) have gone down.

What about local prices? They have gone up. There was this transfer whereby when access prices came down local prices would go up to some extent. But how do we measure whether this has helped or hurt consumers? In most places, consumers can make an unlimited number of local calls. So, we need to measure things by penetration. Under the Communications Act of the 1930s, the country decided that it wanted to have universal service. That led to a lot of mischief in the future, because AT&T regulators kept local prices quite low by subsidizing them with long distance prices. When these local prices went up, you would expect people to drop off the network. In fact, when the FCC changed its policy and introduced the SLC (Subscriber Line Charge) in the middle 1980s, the Consumer Federation of America and the U.S. Public Interest Research Group testified to Congress that they predicted that six million subscribers would drop telephone service between 1984 and 1986. It turns out that during that period there was actually a 4.1 million increase in subscribers. There was an output increase, even amongst local penetration, which has continued. From 1984 to 1990, penetration in the U.S. went up from 91.4 percent to 93.3 percent and, in California, it went up from 91.7 percent to 94.8 percent despite the greatest influx of immigrants we've seen since early in this century and despite the fact that many of these immigrants perceived the phone company as the government.

So, local penetration has gone up. But how could this have happened if the price also went up? Hausman explained this by arguing, that when people have thought about penetration in the past, they have thought only about local price and have argued that penetration is sensitive to the price you pay per month. In this view, regulators were very frightened that numbers of subscribers would decline if they raised prices. In fact, that hasn't happened. Hausman's econometric study suggests that people buy service now not only for local calls but also for long distance calls. Long

distance has become a fact of life, even for poor people, according to Hausman. Hausman looked at all Lifeline customers (the equivalent of welfare for phone service) in California and found that 30.7 percent of the total bill for these customers was for intraLATA calls but, adding in the long-long distance phone calls in, he found that sixty-five percent of the total bill was long distance. This suggests that even poor people want to make a lot of long distance calls. So, when you think about penetration, you have to think not only about the local price but also about the long distance price. And although the local price has gone up, the long distance price has gone down in a way which has encouraged consumer use. Penetration, therefore, has increased.

In both of the output measures used by Hausman, all three flavors of long distance have gone up quite significantly, and the local penetration has gone up quite significantly as well. The next thing that the FCC should do, according to Hausman, would be to continue this process and to raise local prices even more by an increased SLC. By increasing the subscriber line charge, that is, by getting rid of the subsidy for local rates, you are actually making people better off. So long as we have something like Lifeline service, which keeps poor people on the network, such a policy of increasing the SLC would continue to increase consumer welfare.

Hausman considered the reasons behind the trends he discussed. In his view, everything he spoke about today in terms of prices could have been done under the old regulatory system, if the will had been there. In other words, there is not competition-induced boon that has caused the above trends. Hausman did a study to consider whether or not there have been new innovative products and services which have caused people to use more long distance, or whether the aforementioned change in increased long distance had been caused by price. He claimed that there has been no outward shift of the demand curve for long distance; there has only been a movement along the demand curve. This means that price has explained all the change in long distance, which means that the regulators could have done the same thing. Hausman raised the point, however, that there were political considerations for the regulators and that these issues probably interfered with what they did.

Regarding new products, Hausman claimed that 800 service has been the most innovative product in telephone telecommunications in the last thirty years. This was invented in 1969 by AT&T. We haven't seen anything close to that since, despite much more rapidly changing technology. However, according to Hausman, regulators could have done the same thing.

Hausman noted that one outcome of deregulation and changing competition has been large gains in productivity. Studies for Pacific Bell show that their productivity has been growing in the range of 7% to 9% per year. Hausman spoke about AT&T in terms of its productivity as a bureaucracy. One of the big things we've seen since deregulation of competition has been an incredible downsizing in the number of employees. Again, this is partly related to technology, but a lot of it has to do with gains in efficiency. This is a first order economic gain, in Hausman's view. We see them producing the same product - or an even better product - with lower cost.

Referring to the initial overheads regarding eight-firm concentration ratios, etc., Hausman claimed that the telecommunications industry long distance shows an extremely high concentration level. Yet, if we look at the industry, it is tremendously competitive. So, much of traditional industrial organization, which emphasizes that structure can predict the conduct or performance, has nothing to say with respect with telecommunications. He ventured that this claim may hold true for the airlines industry as well.

The final speaker was Prof. Richard Caves, from the Economics Department of Harvard University. Caves remarked his major work on regulated industries was a long past piece of research on air transport. He also had done reading in the telecommunications sector. His talk today constituted observations and assessment of a number of pieces of research conducted by economists who have studied the changes in the telecommunications industry as a result of deregulation.

Caves remarked that it's worth ruminating on where an economist looks to observe the effects of any form of deregulation. It does have to do with whether prices fall and quantities increase. In telecommunications, there are a few more subtleties that enter into the picture.

Among the effects of the deregulation of, first, long distance and now, to some extent, local service and of the AT&T break-up is the considerable opening up of the markets for equipment and considerable expansion of the possibilities for the reallocation of activity within the sector (broadly speaking, these two factors can be deemed to increase productivity). Secondly, the AT&T break-up was accompanied by the undermining of the traditional consensus on how the revenues from long distance service should be carved up, and by a reduction in the use of cross subsidy to household users. So, among the consequences we want to look at is the degree to which prices have changed and, as a corollary, the redistribution of income that may have occurred.

Adding to Hausman's comments on productivity, Caves noted that the work on productivity that he has seen in the telecommunications sector supports Hausman's data. Not only has productivity been rising rapidly in recent years but, in the context of the last twenty years of deregulation, the rate of growth of productivity has been accelerated over that period of time. This acceleration is consistent with the effects of some opening up in the long distance market in the early 1970s and, of course, the changes following the AT&T break-up in 1982.

The telecommunications equipment market is an important area for consideration because, according to Caves, one of the forms of gain in efficiency or productivity in the sector broadly defined has been access of users (by which he meant both telecommunications firms and their customers) to a wider range of choices about the equipment that they might utilize.

Caves mentioned a recent piece of research by economists using ordinary U.S. Census Bureau plant data. Their information bears on productivity changes in the individual plants that produce telecommunications equipment. The rapid increase in productivity of that telecommunications sector over recent years can be broken down into that within individual plants in that sector and gains due to the re-allocation of activity between plants with low and high levels of productivity. What they found was that the big story was that highly productive plants had been gaining share within the industry in recent years, while other plants had been losing it. The productivity increase was remarkable even compared to any typical manufacturing industry. Caves concluded that this opening up of the equipment markets has allowed suppliers who were productive to gain considerably in shares of activity relative to everybody else. Another consideration is the fact that users now have access to foreign sources of supply; in 1982, only four percent of our total use of telecommunications equipment consisted of imports, whereas in 1987 that total had gone up to nearly fourteen percent.

So, the trends in productivity for both telecommunications services and equipment show that there has been a very considerable rise that coincided with deregulation. Caves suggested that this trend represents a significant effect of deregulation after we control for various changes in technological opportunities that have come along as well.

Caves commented on the quality of telecommunications services, remarking that the speakers on airlines deregulation had correctly observed that quality is not just a question of the value of output relative to the value of inputs, but also costs incurred by users when service is temporarily unavailable or degraded in quality.

Evidence on quality of telecommunications services is found in Robert Crandall's recent study at Brookings on the telecommunications services industry. Caves remarked on the simplicity of Crandall's methodology for evaluation whether or not there have been major quality problems with telecommunications services. Crandall reasoned that, if there were major quality problems, people would have complained to the state regulatory commissions and that those commissions would be well aware of public dissatisfaction. Crandall's telephone interviews with state commission offices indicated that there was not a major quality problem. Caves observed that, insofar as there is a quality problem, it mainly affects large users who have access to alternative sources of supply.

Caves reiterated that, with regard to productivity, the story seems to support the fact that there have been gains from deregulation, which is quite consistent with the previous speaker's point about activity increasing and price falling. Caves turned his focus, now, to comment on the findings he has seen on the structure of prices (the prices for long distance, the access charge

issue and its effect on household subscribers, local service, etc). It is agreed that the prices of long distance service have fallen, and many argue that because there is more than one long distance provider, prices will settle at marginal cost over the long run. Caves speculated on this assumption. For the most part, we have three major players in the long distance market. We started out the process of deregulation after MCI and Sprint - relatively low cost carriers and hungry starters - were on the market. They had a considerable incentive to cut prices at the start, given their small market share. AT&T held off meeting the others' price cuts, giving up market share in the process. Now AT&T has lost enough to have a much increased incentive to price competitively.

Caves wondered if, in the future, three firms would be enough to guarantee us prices that are equal to marginal cost. One cannot be confident that the current market structure will guarantee a purely competitive outcome. The real question is whether competition of AT&T with the new carriers is giving us more effective service and lower prices than we would have enjoyed with continuation of the FCC's regulation if it were to continue its long tradition of relative laissez faire. Some would argue that we are always better off with some competition - even among only three firms - than with somnolent regulators. But Caves commented that the current situation still leaves open the question of how competitive the market will be in the future.

Caves next considered local service prices and the income distribution issues associated with the change in the separations pricing and the increase in the so-called access charge (basically the fixed charge that households pay for their local service). The data that Crandall and others have assembled on effective prices of local telecommunications service seem to suggest the following, according to Caves. The real prices of telephone services to household users were falling throughout the 1970s until about 1981 (prior to the divestiture), but started to rise and continued to do so until about 1986. Since then, these prices have been on a downward trajectory. Although the households did take something of a hit then, they did not take a terribly large one. Indeed, the typical urban household probably continues to pay a price for its telephone services that is at least somewhat below the marginal long-run cost of their provision. Caves maintained that, for that reason alone, an economist who cares about overall social welfare benefits (and not just "households versus somebody else") will regard the real increase in households' charges not unfavorably.

Urban households, in any case, apparently were never beneficiaries to all that much cross-subsidy through long distance pricing, simply because they are mainly off-peak users. If anything, the group that was a big beneficiary from the former cross-subsidy patterns was the rural population. There have been substantial institutions which have subsidized telephone services to rural users, and it costs them a lot more to provide service to them than to the typical urban household. However, if one maintains that people ought to pay the marginal cost of what they consume (and economists are prone to do that), then one can say that the income redistribution has not been out of line with such a notion.

Caves discussed the degree to which subscribers have stayed on the system. If you look at the lowest household income recipients, it appears that the early- to mid-1980s increase in the price of access to residential telephone service knocked down by about three percentage points the number of household using service. So there was some reduction of use, but broadly speaking, the overall use trend continues upward. One also should remember that low income people do not use only base services, but are also users of the components of telecommunications services which have fallen in price. Crandall's data on the dollars of benefit redistributed per year away from low income households and towards higher income households (i.e. earnings over $40,000 per annum) do not suggest a significant loss for the lower income group.

A final issue covered by Caves - one for which there is not a lot of completed research - concerned the fact that technological changes seem to be on the verge of doing for local telephone service what the opening of competition in long distance began to do twenty years ago. The press has reported recently on the new players in local telephone service. These include firms such as Teleport, supplying high quality service to large business users; the private branch exchanges by

:arge firms increasingly self-supply; cable t.v. systems; etc. Clearly, a lot of change is ing in the forms in which local telephone service is being provided. As one sees them g out in some of the forefront urban areas, the modes of access to telephone service might ;e considerably for local users. That is likely, in the future, to involve shifts in the mix of ers and in some of those same productivity gains and price readjustments that have already ed in long distance service.

Caves ruminated on how this prospective change relates to some of the changes that have ed in air transport over the years. Suppose that the trends that have been seen in some of w York state regulations in recent years persist. New York Telephone will indeed be required w almost anybody to connect with its switches to supply local service, and will be required undle its pricing so that it sells its switching service separately. If that happens, the result be that such natural monopoly elements as there are in telephone service might largely ear. The effective competitiveness of local telephone service could exceed the effective titiveness of air transport, certainly at a hub city that is dominated by a small number of s. At New York Telephone switches, I suspect that there is no longer a capacity constraint ay there is at Washington National Airport. Nobody controls the gate positions the way they aGuardia Airport. The potential entrants into the market have not been killed off. All of this the possibility that, sometime in the future, it might be that local telephone service is a more stable and competitive activity than air service - at least to such cities as Atlanta. How this out will depend, at least in part, on how regulators react. Unfortunately, a number of these s (especially about local telephone service) will depend upon outcomes fought out in the al arena. Will the operating companies be liberated? Will they be able to defend their turfs t such incursions as described? Will decisions be made on the basis of prospective cost iveness or on the basis of lobbying efficacy? These were closing questions raised by Caves.

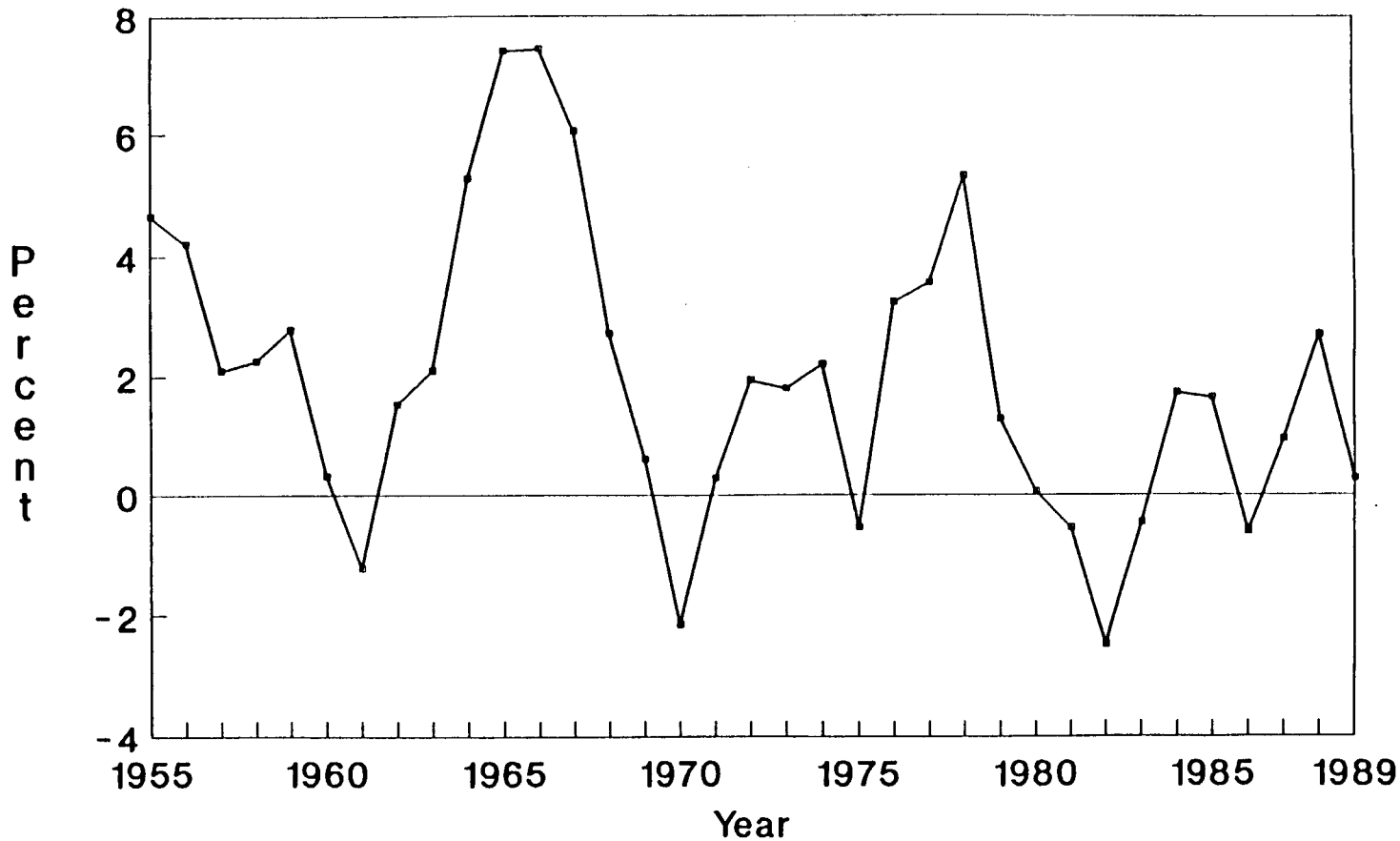
ion & Answer

The first questioner commented on the fact that while there is a lot of discussion about nal cost, we need to recognize that this is highly different in a capital intensive industry if we lking about the cost at the margin of capital already invested or if we are talking about g large, new capital investments for the future. One view of deregulation is not only that it ates a transfer from short- to long-distance, but also that it creates an inter-temporal transfer en the present and the future. All these savings that we are seeing now (or that we believe e seeing now) in costs aren't just coming out of excess personnel being left aside or out of ses in productivity, there also may be savings resulting from lack of investment in the long- system encouraged by greater competition. The questioner asked the panelists to address the ion of who is going to invest in the system if we don't have large players (like AT&T) that can l to do the investing and researching.

Hausman addressed the issue of measurement. He noted that when he and Caves were ssing productivity gains, capital was taken into account. Further, he suggested that the airline try has seen exactly the reverse of what the speaker alluded to. There are two things which occurred that need to be considered. First, under the old style of regulation (rate of return ation) the telephone company and other utilities were in a sense promised a certain rate of n, and gains above that were taken away. Worse than that, there were regulators who ed on what technology the companies should use - this was what is referred to as micro- gement. What has happened is that the FCC, while somnolent is still better than most state ators, has gotten rid of the old system. Productivity gains aren't as tightly regulated, and this ctually spurred investment. The increase in investment, of course, is also partly technology- l, because fiber in the network has come into the fore. But Hausman maintained that there een an improvement.

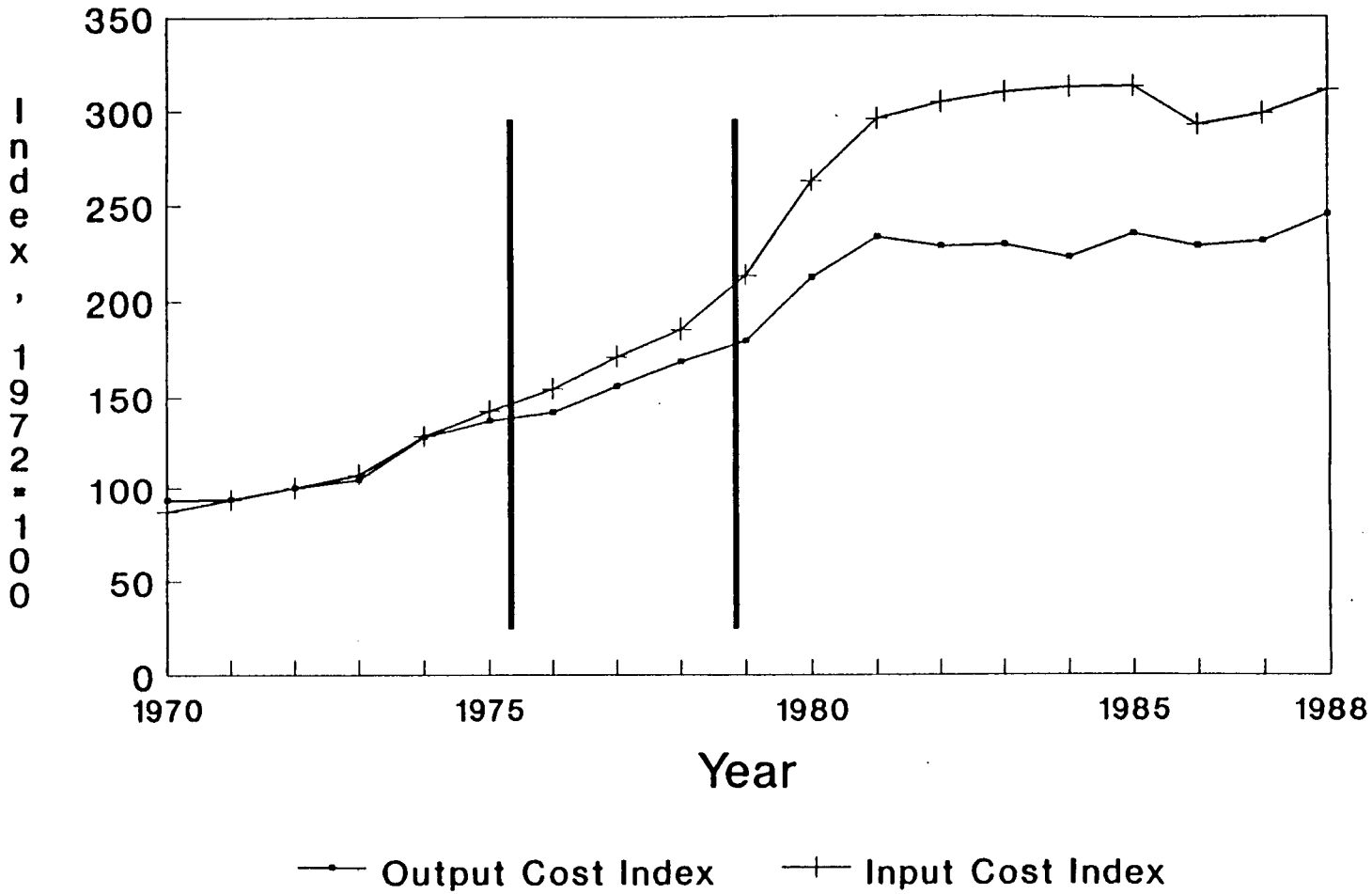
Hausman then considered the question of what would have happened if there had been no gulation and if there was still one AT&T providing all the long distance services. If you look at

Net profit margin for total certificated air carriers.

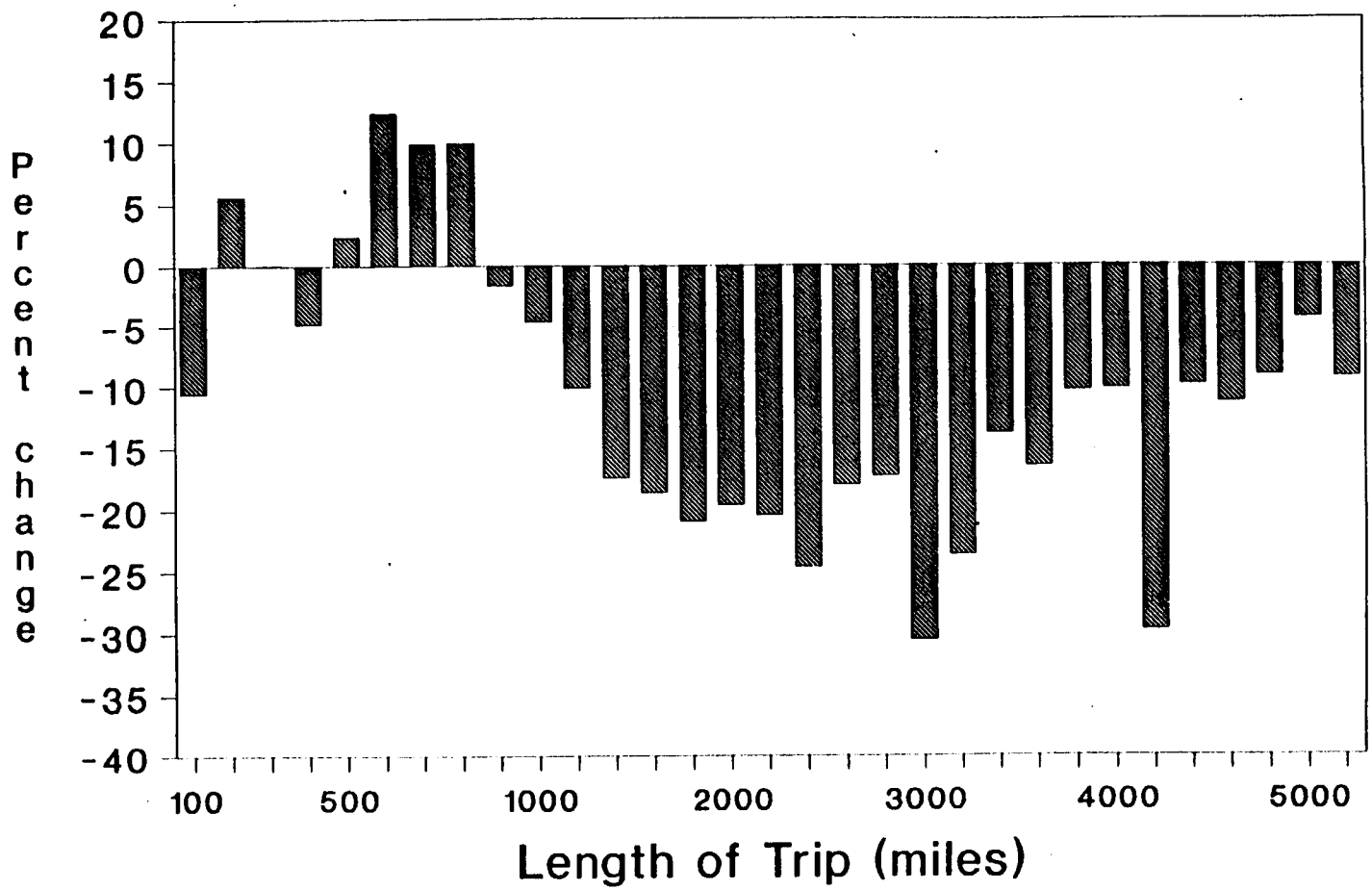


Slide 3

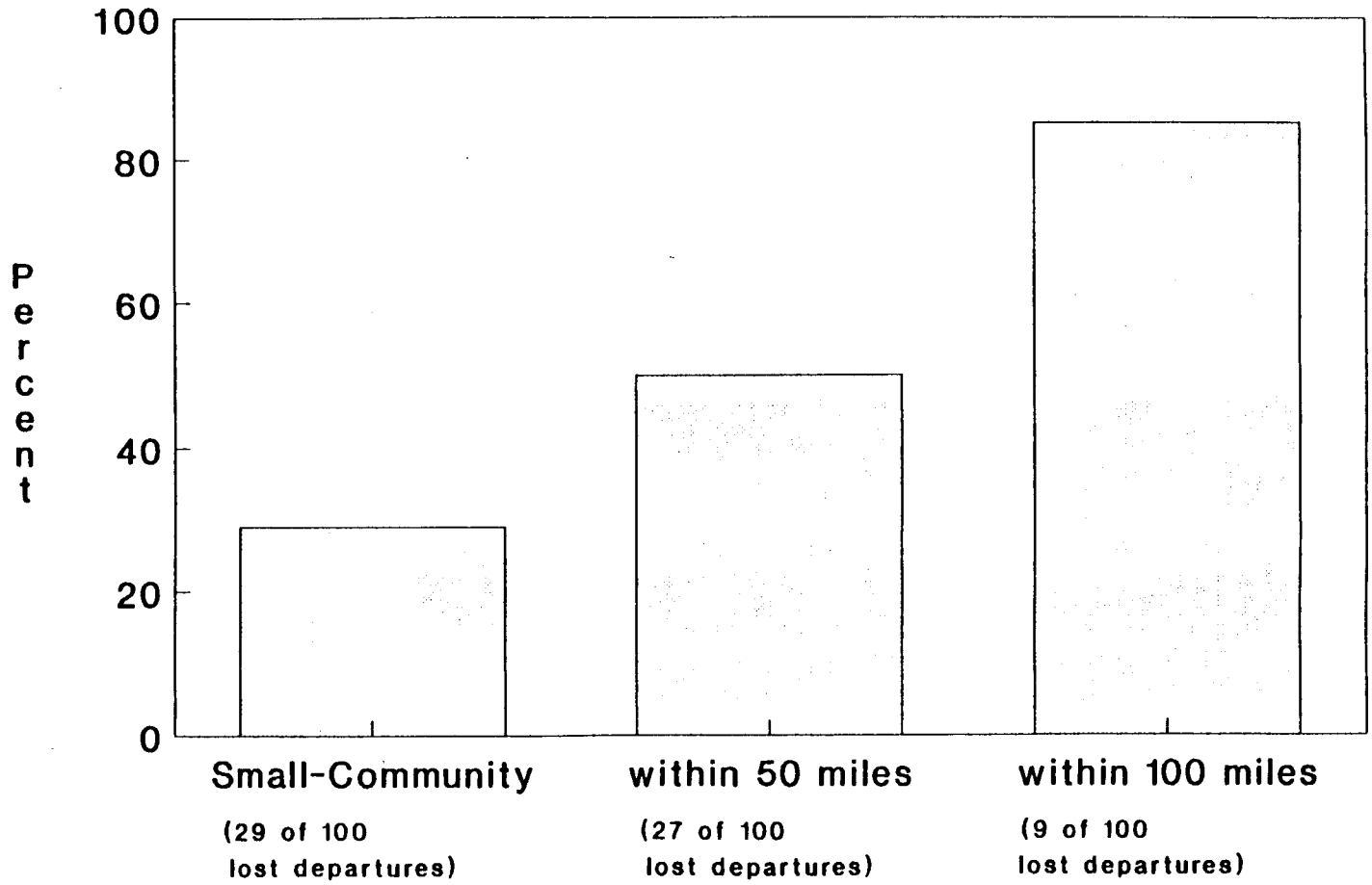
Trends in airline costs and output



Percent Change in Average Real Yield by Trip Distance, 1979 to 1989

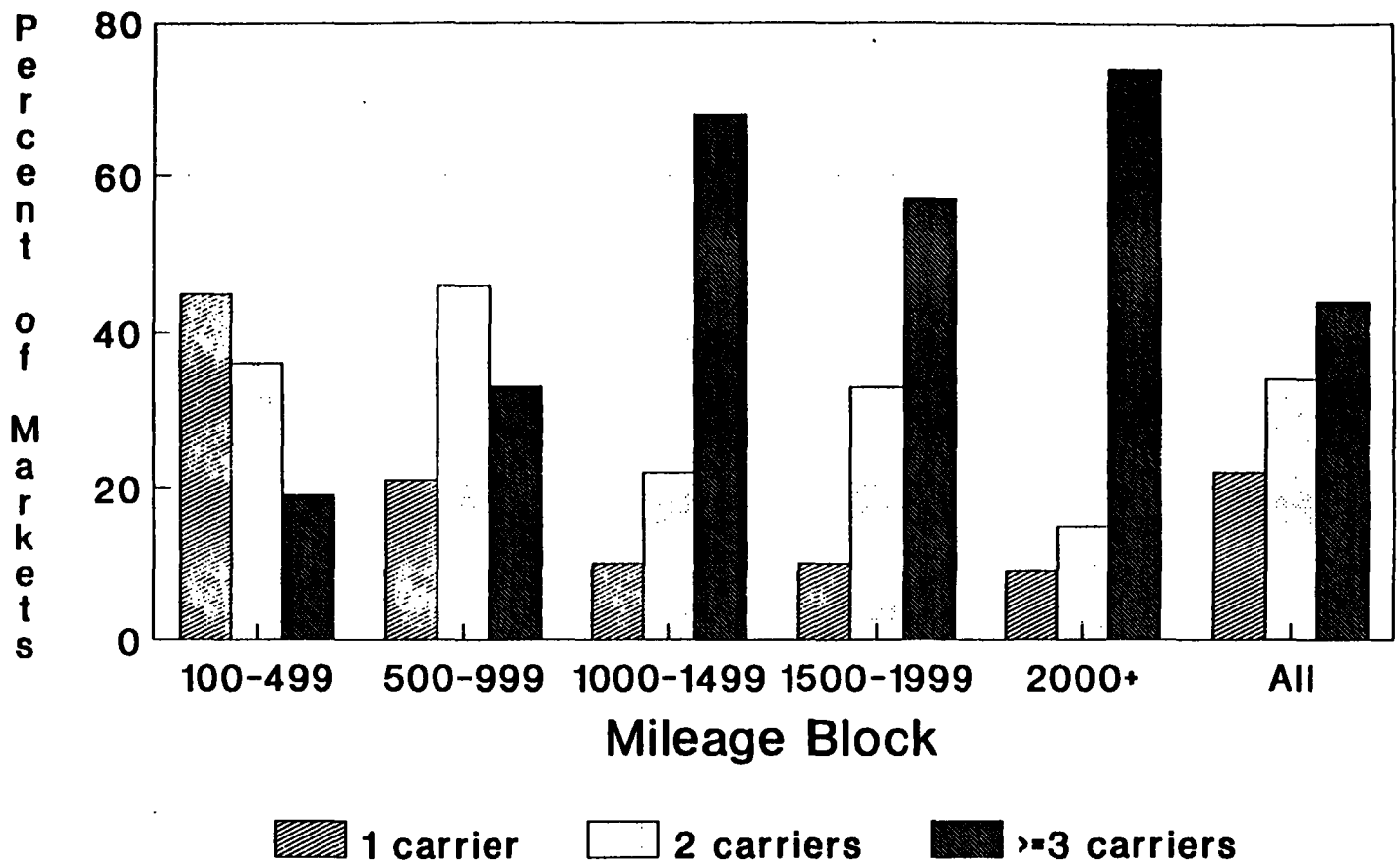


Median Change in Departures in Formerly-Subsidized Communities and their Region 1977 to 1988



SLIDE 6

Competition in City Pair Markets by Market Distance, 1989



Fatal Accidents per 100,000 Departures
Part 121 Carriers and Part 135 Carriers