Deregulation: Causes and Consequences

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As a consequence of deregulation, there have been fundamental changes in the way transportation and communications firms are conducting business. Companies are finding that they must be driven by market opportunities and financial needs, not by regulatory considerations. Prices must be based on cost, operations must become more efficient, and consumer-oriented product niches must be found. Moreover, deregulation has added a new element in industrial dynamics, by fostering more relations between the various modes of transportation and by cross-fertilization in computer and telecommunication technology. All in all, a more competitive and innovative spirit emerges from deregulation.

MUCH IS KNOWN ABOUT THE CONSEQUENCES OF DEREGulation of airlines, trucking, railroads, and communications. Some economists are aware of the results, but people in other disciplines are less knowledgeable about what has happened. This summary is written to inform the scientific community about the effects of what has been a social science experiment replicated in four major industries (*1*).

The agencies that oversee transportation and communications regulation were largely established between 1887 and 1935. Regulatory control over entry (authorization to serve particular markets) was deemed necessary to avoid destructive competition. The limiting of entry, however, conferred monopoly pricing power, which was controlled by regulating price as well. Initially, the railroads accepted regulation to ensure stability and orderly growth; the agricultural interests actively sought regulation to protect them from monopolistic exploitation by the railroads. However, technological change lowered the costs of some services and brought new modes into being, thereby complicating the task of regulation. In transportation, the regulatory net spread from railroads into structurally competitive sectors such as trucking. In communications, cross-subsidy became the rule as political (rather than economic) forces distributed the benefits of technological change.

Over time, it became increasingly evident that regulated companies lacked incentives to keep costs under control and to be responsive to consumer demands. The regulatory agency began to be seen as an inadequate forum for decisions about whether there was a market for new technology. Reforms began in communications as early as the 1950's and gradually spread to the transportation sector, reaching a peak in the late 1970's and early 1980's. In the communications sector, reform came with government intervention through divestiture—the breakup of American Telephone and Telegraph (AT&T)—as well as deregulation. In contrast, in air transportation, deregulation meant virtual elimination of economic intervention, through removal of governmental control of entry and prices. In transportation, Congress and regulatory agencies played the major reforming roles; in communications, significant deregulatory steps were taken by the Justice Department, the courts, and the Federal Communications Commission.

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Motives and Extent of Deregulation

Deregulation measures have been most extensive in the airline industry. Since the mid-1930's, the Civil Aeronautics Board (CAB) had controlled entry into airline markets by establishing boundaries between types of carriers: trunk airlines served major long-haul markets; local service airlines provided subsidized jet service within regions and gathered short-haul feeder traffic for the trunks; commuter airlines with small propjet aircraft served the thinnest markets without rate or route regulation; supplemental carriers provided charter services. Each trunk and local service carrier was further restricted to specific routes; for example, United Air Lines was authorized to serve north-south routes on the West Coast, while Delta or Eastern served such routes on the East Coast. A few carriers provided jet services wholly within state boundaries, and thus were exempt from CAB regulation. The rates of these intrastate airlines were set by market competition, whereas the fares for CAB-regulated trunk and local service airlines were determined according to a set formula.

The early impetus for deregulation was provided by studies comparing costs and fares of regulated carriers with those of the intrastate airlines. Analyses showed that fares were nearly 50% lower for the intrastate carriers over comparable routes and, moreover, that these carriers were generally profitable even with the lower fares (*2*). Moreover, studies showed that lack of CAB jurisdiction over frequency of flight and investment in aircraft, along with a regulatory price formula in which the excess of prices above costs tended to be greater the longer the haul, had produced uneconomically low load factors (percentage of seats filled) on long-haul flights (*3*). Still other analyses found that scale economies did not exist to a significant degree in the airline industry (*4*). Thus, when administrative deregulation at the CAB began in 1976, and when Congress passed the Airline Deregulation Act in 1978, a scheme of total economic deregulation was adopted. Route authority was to be phased out on 31 December 1981, and fare regulation 1 year later. The remaining tasks, involving international negotiations and small community service, shifted to the Department of Transportation on 1 January 1985, at which time the CAB ceased operations. There were no changes in safety regulations, which are overseen by the Federal Aviation Administration (*5*).

Deregulatory measures in surface transportation have not been as pervasive as those in the airlines. The jurisdiction of the Interstate Commerce Commission (ICC) over railroads began in the last quarter of the 19th century and over trucking, it began with the Motor Carrier Act of 1935. Regulatory control of trucking took the

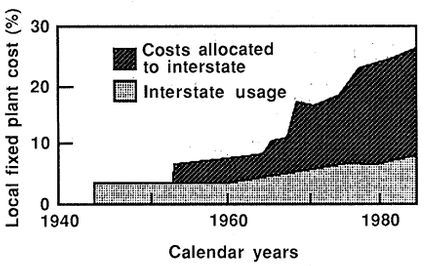


Fig. 1. History of local exchange, fixed costs allocated to interstate service. [Adapted from (*9*)]

form of certificates describing the commodities permitted to be hauled and the specific routes along which each commodity could be carried. Railroad rates were strictly controlled, and fares for manufactured goods were set high relative to those for bulk and agricultural commodities. Yet, because costs of delivering manufactured goods were not much different for rail than those for truck, trucks were able to draw this profitable business away from the railroads (*6*). Thus, in time, the high-rate high-margin traffic of the railroads eroded, and the low-margin traffic remained. Return on rail investment averaged a mere 2.42% between 1962 and 1978, contributing to low investment, inadequate maintenance, and deteriorating service.

Bankruptcy of the Penn Central focused interest on the plight of railroads, and two pieces of railroad legislation were passed, one in 1976 and the other in 1980 (*7*). The reform legislation codified the view that full deregulation was not appropriate for railroads since some markets, such as coal transport, were captive. Rate regulation and price intervention were to be maintained in such captive markets (where effective competition from trucks was missing). Other markets (where railroads and trucks could compete effectively) were deregulated. Truck reform legislation was passed in 1980. It liberalized entry policies by shifting the burden of proof to opponents to show that entry would be harmful to consumers; it did not eliminate antitrust immunity for collective rate-making, although it did grant some degree of pricing freedom.

The purpose of telecommunication regulation was to make high quality service available to everyone in the country at reasonable prices. The Federal Communications Commission (FCC) assumed responsibility for regulation of AT&T's interstate services in 1934, but state regulation of intrastate services continued. With interstate services connecting through the local exchanges, and with new technology greatly reducing long-distance costs, state regulators sought to allocate more local phone costs to long-distance calls (*8*) resulting in cross-subsidy (Fig. 1) (*9*). Subsequently, new technical developments, such as microwave and satellite, made obsolete the natural monopoly justification for long-distance regulation. Thus, the FCC began to permit new entry, and the courts went even further. For example, in 1959, the FCC gave firms the right to use microwave transmissions for private lines, that is, telephone services not involving any connection with the local Bell exchange. In 1969 it allowed Microwave Communications, Inc. (MCI), to build limited microwave facilities connecting Chicago, St. Louis, and nine intermediate points. The D.C. Circuit Court in 1977–1978 went beyond the FCC decisions by extending freedom of entry and allowing direct competition with AT&T on long-distance service (*10*).

The most important deregulatory move in telecommunications came with the antitrust suit against AT&T which was filed by the Department of Justice in 1974 and settled in early 1982. As part of the settlement, AT&T agreed to divest itself of the local portions of its 22 Bell operating companies, which were restructured into seven separate regulated monopolies. These seven new operating firms are excluded from long-distance service and from manufacturing terminal equipment. AT&T continues to provide long-distance (but not local) service and manufactures terminal equipment, but other suppliers may compete in both spheres, and customers can choose any supplier they wish. Moreover, by the end of 1986, all long-distance companies will have the same convenience of connection to local networks as that afforded to AT&T. Finally, the government has removed the restrictions limiting AT&T to provision of common carrier services and has permitted AT&T to enter the information systems area.

Consequences of Deregulation

The contestable market theory (*11*) is used as a broad framework to analyze the consequences of deregulation. According to this theory government should seek policies that promote contests for markets. Large size or limited numbers of firms do not necessarily mean that markets will function poorly. Impediments to entry and exit rather than degree of concentration or scale of operations may be the primary source of interference with market efficiency (in the sense of promoting cost-minimizing industry structures). Although neither transportation nor communication markets are likely to be perfectly contestable, the contestability benchmark is useful in evaluating deregulatory policies and outcomes in these sectors. For example, regulatory policies tend to support cross-subsidization; deregulation should, if the industries have elements of contestability, lead to a dramatic lessening of the cross-subsidy. Similarly, regulatory policies tend to encourage a high-price and high-service product; deregulation should, if lower-price lower-service options are viable, lead to the creation of a larger selection of products at different prices. Regulatory policies draw artificial boundaries that interfere with the scope of a firm's operations, and they do not provide incentives for firms to operate efficiently; deregulation should, if the industries display the properties of contestability, provide enormous pressure to improve productivity.

Significant technological, productivity, and competitive developments have occurred in the transportation and communication industries since deregulation. However, these cannot be entirely attributed to the decontrol movement. The transportation sector has had to adjust to rapid increases in cost (most notably from fuel prices), the firing of the air traffic controllers, and a prolonged recession. In the transportation analysis both quantitative issues of the different effects of these causative factors, and qualitative issues, such as whether the industry's performance displays an increase in efficiency and competition and whether changes are consistent with the contestability benchmark, are discussed. The communications sector is even more difficult to assess, since divestiture occurred only 2 years ago. For both sectors, four sets of issues are considered: productivity improvements in labor and delivery systems, increases in the diversity of price-service options, adjustment of prices toward incremental costs, and transitions in market structure and profitability.

Delivery System Now Much More Productive

There have been substantial changes in transportation delivery systems since deregulation. By and large, these changes reflect rationalization and efficiency improvements in prior operations. Airlines have seen a significant consolidation of hubs, typically involving a reduction or elimination of some minor hubs in favor of expansion at one or two major hubs. The changes have been motivated in part by economies of vehicle size (lower costs per passenger for larger aircraft), and in part by demand and marketing

Table 1. Indexes of real freight rates and average compensation. [Adapted from (*16*)]

Mode of delivery	Sample size	1975	1976	1977	1978	1979	1980	1981	1982
				Rates paid by shippers					
Truck load	35	100	100	100	99	95	88	81	75
Less than truck load	30	100	103	105	104	101	98	91	89
Rail	23	100	102	96	102	101	100	90	93
				Average compensation					
All employees		100	94	103	96	94	93	87	89
Drivers and helpers									
Mileage basis		100	117	124	109	105	105	106	100
Hourly basis		100	88	114	92	92	92	92	90

considerations (small numbers of individuals wishing to travel between a particular origin and destination). For example, USAir consolidates all passengers wishing to travel from Allentown, Pennsylvania, to points west on a single jet aircraft early in the morning; the aircraft lands at the Pittsburgh hub, and passengers are combined with other arrivals from USAir's regional system to fill aircraft to the desired destination cities (*12*).

In trucking, significant hub-and-spoke route structure enhancement has also taken place as a result of the elimination of vehicle routing restrictions. Less-than-truck-load shipments from several originating points are consolidated at major terminal hubs, reshuffled among trucks, and sent out to their various destinations. In addition, there are strong economies to be gained by developing joint distribution networks and by centralizing repair, administrative and other services. The railroad industry was also subject to corporate balkanization (*13*) under regulation. There was no railroad with an integrated national route structure, and hubs such as Chicago were often congested. Moreover, it is extremely difficult to obtain new rights-of-way. Thus, restructuring to improve efficiency has taken the form of end-to-end mergers and some attempts to exploit intermodal operations (*14*).

In communications, the effects of divestiture on productivity are just beginning to emerge. Unlike transportation, the telephone delivery system had been able, under regulation, to coordinate operations through an integrated network. (For example, AT&T commonly routed calls during busy periods through distant switching centers if nearer ones were operating at full capacity.) The hoped-for productivity improvement in communications was based on the benefits of convergence of computer and communication technologies. The importance of this move away from the "phone company" concept and toward an "information movement and management" concept is just beginning to be felt.

Changes in Labor Costs and Work Rules for Increased Productivity

In addition to delivery flexibility, adjustments in labor costs and work rules have played a major role in improving productivity in the post-reform era. There is evidence that regulation allowed workers to earn more than their counterparts in nonregulated industries. In particular, Teamsters Union members earned from 30 to 45% more than employees in unregulated trucking (*15*). Truck owners also benefited significantly from regulation. Thus, both the Teamsters and the American Trucking Association were outspoken against reform; indeed, reform efforts in both 1962 and 1971 in trucking were blocked because of Teamsters Union opposition. It was only after successful deregulation in the aviation industry that the pressures to reduce surface freight regulation proved successful. Table 1 shows the effect of deregulation on average compensation in trucking (*16*). Labor costs have fallen about 14% for all workers since 1977, and drivers and helpers (who are the core of Teamster membership in trucking) lost even more, 21%. Thus, the Teamsters Union opposition to deregulation proved to be justified; deregulation has indeed lowered their earnings sharply.

As in trucking, inflated labor costs in aviation seem to reflect, at least in part, the airline workers' success in the regulated era of capturing a share of the industry's productivity gains. For example, union work rules as late as 1981 required that United have a cockpit crew of three in its Boeing 737 aircraft, whereas other carriers, such as Piedmont and Southwest, had a crew of two; moreover, United's pilots flew 43 hours per month, compared with 73 hours a month at Southwest. A combination of these two work rule differences alone results in more than twice as high productivity of Southwest's 737 pilots than those of United (*17*). In the post-deregulation environment, airlines have sought to renegotiate their labor contracts in response to the competitive pressures resulting from the rapid growth of low-cost carriers, and from the greater competition in general among all airlines. Recent agreements include the easing of restrictive work rules, the ability to hire part-time workers, the institution of two-tier wage structures (under which the newly employed workers are paid substantially less than those hired before the contract), and in some cases the granting of equity positions to labor (*18*).

Just as in transportation, the wave of competition in communications following divestiture and deregulation has led to a hard look at labor costs, productivity, and employment levels. This has been true for AT&T managers and for the Communications Workers of America (CWA) as well (*19*). Before deregulation, it was easier for AT&T to pass along higher labor costs to consumers, much as was done in the regulated transportation sector. But the deregulated environment has provided strong incentives to introduce efficient pay scales and work rules.

The lessons on labor productivity are thus clear. First, labor was a major beneficiary of regulation. Second, nonunion labor gained employment and gradually replaced union labor as new entrants appeared in the post-deregulation period. Third, the adjustment process of labor contract renegotiation for the regulated-era companies has been slow and fraught with difficulty, but competitive pressures are ensuring that it takes place.

Increasing Diversity in Price-Service Options and Cost-Based Pricing

Pricing and service are a third cluster of issues that are important in the period since deregulation. In trucking, the first sign of the effectiveness of entry decontrol was the loss in value of operating authorities (ICC-granted transport certificates that could be bought and sold) and the growth in the number of carriers (*20*). Not only

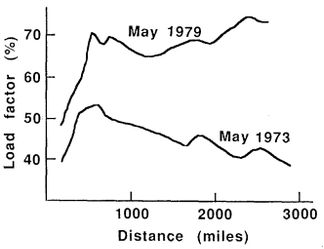
has the number of new carriers risen but the existing firms have been granted increased authority, adding substantially to competitive price pressure. Price data displayed (Table 1) indicate that freight rates paid by shippers declined significantly in the post-reform period. Real rates for truck-load shipments decreased steadily from an index of 100 in 1975 to one of 75 in 1982. Less-than-truck-load charges went from an index of 100 in 1975 to one of 89 in 1982. Significantly, these price declines (25% for truck-load and 11% for less-than-truck-load) occurred during a period when fuel costs for the industry more than doubled.

In comparison, rail rates did not start to decline until 1979 and have fallen only 7%, far less than in trucking. Nevertheless, railroads did reduce charges in many cases and increased traffic as well. Table 2 displays indexes of railcar loadings for various types of traffic in the post-reform period. Rail more than doubled its shipment of fruit and vegetables after May 1979 when it was allowed to offer rates based on costs (rather than regulated rates aimed at cross-subsidy). Similarly, its carriage of trailer-on-flatcar went up by half, whereas its haulage of grain remained fairly constant. Thus, the relative cost advantages of the different modes of transportation began to exert themselves in the post-reform period. Where rail had a cost advantage that had not been permitted to be reflected in pre-deregulation prices, rail service went up significantly. Where railroads already dominated a business, such as in the carriage of bulk commodities, deregulation did not do much to increase carriage.

Nevertheless, deregulation did exert downward pressure on bulk commodity rates because the 1980 railroad legislation authorized railroads to negotiate prices with shippers rather than charging fixed, regulated rates. At the end of 1983, some 13,000 negotiating contracts had been filed with the ICC, covering practically every commodity. Many are for bulk commodities, such as chemicals and minerals, on which the shippers now pay reduced rates in exchange for volume commitments or other shipper concessions that enabled railroads to lower costs (*21*). Negotiated contracts are also used to attract traffic from other modes (*22*), and they now account for more than 25% of the operating revenues of the major railroads. Moreover, the ICC has recently moved to loosen pricing restrictions in captive coal markets by adopting a constrained market pricing model which reflects contestable markets principles (*23*). In trucking a significant trend toward use of negotiated rates is also evident, stemming in part from the elimination of the tariff-filing requirement for contract carriage. According to recent surveys, shippers report that carriers are much more willing to negotiate rates and services than they were before deregulation. Moreover, various innovative price and service options are arising. For example, in the household goods moving industry, several carriers are now offering binding estimates and guaranteed service dates, and shippers are being given more insurance options than were offered before the reform legislation was passed.

Airlines are increasingly using fare flexibility to provide quality-price options that match market demands. Under regulation, load factors not only were too low, but they also varied inversely with distance (Fig. 2). One piece of evidence indicating that service is now more in line with the efficient deployment of airline equipment is that, after deregulation, average load factors tended to be higher and to increase with distance, as predicted by theory (Fig. 2). Indeed, post-reform load factors have improved by nearly 30 percentage points on the longer hauls (*24*). Concomitantly, fares are now 40% lower in these markets than would have been standard had the fare formula continued (Table 3). (There were some transcontinental discount fares in pre-deregulation days, so average fare levels were perhaps 10% below the CAB standard.) Fares in shorter haul markets are above the formula fare now, as they were before deregulation. (The local carriers that service many of these markets were permitted to charge 30% above the formula fare in the period before deregulation.) Moreover, the elimination of local service airline subsidies has meant that service has improved in these markets as carriers have restructured their route systems away from hedge-hopping operations over linear routes to hub-and-spoke delivery systems (*25*).

Fig. 2. Airline productivity: load factor versus distance.



The emerging competition of low-cost airlines is also proving important. Ticket prices are substantially lower and frequency of service significantly higher in markets served by the low-cost airlines. A number of studies (*26*) reveal that air travel markets are competitive but not perfectly contestable. Fares in markets with more than one carrier are about 10% lower than in similar monopoly markets; fares in markets with new entrants are about 20% lower. However, it still takes a large number of potential entrants (four or more) to reduce fares substantially. Nevertheless, such residual market power is limited by the ease with which carriers are managing to enter and exit markets.

Airline fare policies are still emerging as carriers experiment with various price-service combinations. Since deregulation, carriers have used capacity-control features to ration the availability of discount seats on peak flights, so that full-fare passengers are assured a high probability of access to these more popular flights, while increasing the availability of discount seats on off-peak flights. Indeed, the percentage of discount passengers has risen substantially from well below 20% in the deregulation period, to more than 80% in recent years. The introduction of reduced connecting fares has also accounted for some of this rise. These fares have been used to induce passengers to travel one-stop to destinations that have nonstop service offered by a rival airline. A carrier is willing to offer such discounts in order to fill otherwise empty seats on its flights and, thus, make its hub-and-spoke operations more economical. Frequent flyer programs attempt to induce brand loyalty in a market

Table 2. Index of railcar loadings. [Adapted from (*16*)]

Traffic	1978	1979	1980	1981	1982	1983	1984
Fruit	100	104	136	196	232	260	
Vegetables	100	92	140	203	232	192	
Coal	100	119	129	130	127	118	134
Grain	100	107	117	101	94	103	106
Trailer on flatcar	100	101	90	95	105	127	146

Table 3. Airline fares as a percentage of CAB formula fare (index of 100): 1983, second quarter. [Adapted from D. P. Kaplan (*18*)]

Market distance (miles)	Market size (passengers per day)			
	10–50	51–200	201–500	501–1000
1–400	114	112	95	71
401–1500	110	97	87	80
≥1500	*	75	65	60

*Too few markets to provide reliable comparison.

environment in which seats are increasingly viewed as a commodity product.

In communications, deregulation is bringing higher prices for local services but lower prices for long-distance calls. Table 4 presents an estimate of the likely effects of competitive pressures to move prices closer to incremental costs absent price intervention by regulators (*27*). Current prices for access to the local network, assuming flat rates for local service, would nearly double from their current level of $11.73 per month to $21.73 per month. However, prices for long-distance calls would be lowered by over 60%, from $0.25 per minute to $0.09 per minute. For individuals who use as much toll as local service, the net bill would show a saving; however, for those whose telephone usage is predominantly local, the total bill would increase. From the economists' viewpoint, there is welfare gain from the price increases as well as from the price reductions. For, pricing below costs encourages society to purchase too much local usage, just as surely as pricing above incremental costs means foregoing the value of desirable long-distance service.

In the actual (rather than hypothetical) situation, there has been significant price intervention by regulators in the period since divestiture. For example, customers choosing MCI or GTE Sprint rather than AT&T as their long-distance carrier may have to dial 13 digits or more for access, and the FCC has thus given the smaller long-distance carriers an interim discount on access charges. The FCC has also continued to charge access fees on a per-minute basis, which fails to reflect the lower costs of large users; thus, the large users have an incentive to supply their own services, "bypassing" the local exchange in order to internalize the benefits of their lower costs.

Since deregulation, competition has been fierce in the growing market for telecommunications equipment. For example, the market for on-premises equipment (including terminal equipment, data communications equipment, local area networks, switching equipment, and attached network functions) grew from $9.78 billion in 1983 to an estimated $14.16 billion in 1985 (*28*). The collapse of office computer sales in 1984 and 1985 spawned cuts in PBX (private branch exchange) equipment as much as 50% below the usual level. This industry is characterized by international competitive forces (as are most other manufacturing firms in the unregulated sector), rather than by the half-regulated, half-free regime of local and long-distance service.

Market Structure Changes and Profitability

Figure 3 displays the post-deregulation average operating profit margins for the trunk and local airlines. The local airlines have enjoyed stable operating profit margins because of their regional (geographically based) dominance and because of efficient use of smaller jet planes suitable for short-haul service. The trunks have less stable (and lower) operating profit margins, which reflect the economic business cycle as well as an oversupply of large planes suitable for the longer hauls (*29*). In a recent wave of consolidations, the smaller domestic trunks are merging with local carriers (usually with the carrier that shares their main hub airport) in an effort to improve the level and stability of their returns. Other consolidations suggest that carriers hope to establish national (rather than regional) presences (*30*).

In the railroad industry, the largest railroads have significantly increased their market share, largely through consolidations (as outlined earlier) (*31*). Earnings of class 1 line-haul railroads, as reported in the condensed income statement of the ICC (*32*), have risen from negative returns-on-equity in 1976–1977 to about the 6% level during 1979–1983. Though returns are still below competitive levels for the economy as a whole, the partial loosening of regulatory constraints on the railroads along with changes in the tax laws would seem to have been very beneficial financially, both to the railroads and to the general public, which would have been harmed in the long run by a continued deterioration in rail services.

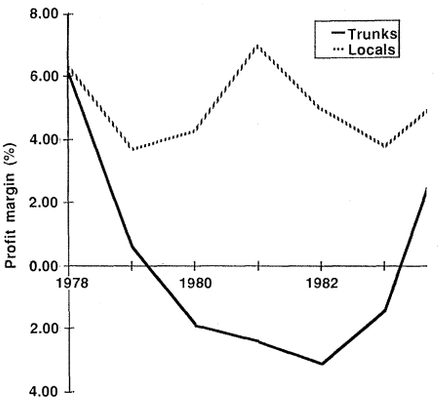


Fig. 3. Mean operating profit margins for local and trunk airlines, 1978–1984. Trunks include United, American, Delta, Eastern, TransWorld, Western, Pan American, Continental (includes Texas International), and Northwest. Braniff, which declared bankruptcy in 1981, is not included. Locals include Republic (North Central, Hughes Air West, and Southern), USAir (formerly Allegheny), Frontier, Ozark, Piedmont, and Alaska.

Analysis of stock valuations have revealed that in the early deregulatory period (through 1981) truck carrier groups experienced declines in post-reform equity (*33*). Many large firms (such as Consolidated Freightways and Yellow Freight System) continue to have total returns to investors of 35% or more, whereas a number of the formerly regulated firms have gone bankrupt. As in aviation, it is an advantage to have nonunion labor (such as Overnite Transportation) or to have found a market niche (such as Miami-based Ryder Systems). As in railroads, there has been some tendency toward increased concentration among the largest trucking firms.

In communications, the post-deregulation market structure is still being influenced by divestiture, technological change, and the regulatory overlay. In telecommunications, there are now three main players in long-distance services: AT&T, MCI (now owned in part by IBM), and GTE Sprint (now consolidated with United Telecom, as US Sprint). The post-reform market structure is more concentrated than in transportation; in the telecommunications market, for example, AT&T's market share was 70% in 1984, and it may well grow once the interim discount on access charges disappears. The regional companies are doing well financially (*34*), but these results are influenced strongly by regulatory policies (for example, $0.63 of every $1 of AT&T long-distance revenue is mandated to be paid to the regionals). Changes in market share in time will depend fundamentally on the type and degree of continued government intervention—for example, whether regionals will eventually be permitted to compete in long-distance services, wheth-

Table 4. Residential communications costs and prices: 1985, first quarter; adapted from (*27*). The demand elasticity for measured access is about 0.04, while that for toll usage is in the range of 0.6 to 0.8. LATA, local access transport area.

Cost	Cost	Current price
Residence		
Flat access (dollars per month)	21.73	11.73
Measured access (dollars per month)	21.73	6.03
Toll usage		
Intra-LATA (cents per minute)	6.7	17.82
Inter-LATA (cents per minute)	8.0	22.85
Interstate (cents per minute)	9.0	25.28

er AT&T and other common carriers will pay the regionals similar access charges after 1986, and so on. As for competition between AT&T and IBM, AT&T appears to be finding it difficult to break into the computer market, and IBM is similarly finding financial success difficult in its entries into communications.

Lessons of Deregulation

Perhaps the chief benefit of deregulation is that it has increased efficiency substantially. Under regulation, there was little incentive to plan or to pinpoint the sources of markets that were successful and those that were failures, or to keep costs under control and be responsive to consumer demands. In contrast, deregulation is leading to substantially more efficient industries, in which cross-subsidy is absent, a diversity of price-service options is present, and cost-minimizing behavior is prevalent, both in delivery systems and in other operating costs. These developments reflect fundamental changes in the way firms are conducting business. Companies are finding that they must calculate their costs on a market-by-market basis and must learn to base their prices on costs, competitors' prices, and market strategy. From a macroeconomic point of view, deregulation has essentially meant lower inflation and higher productivity, although the overall impact is difficult to quantify precisely. With regard to wage and price formation, there is no doubt that the economy as a whole has benefited, while organized labor has lost. Overall, there have been real welfare gains through lower costs, greater varieties of services, and increased productivity.

REFERENCES AND NOTES

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3. G. Douglas and J. Miller, *Economic Regulation of Domestic Air Transport: Theory and Policy* (Brookings Institution, Washington, DC, 1974).
4. See R. Caves, *Air Transport and Its Regulators: An Industry Study* (Harvard Univ. Press, Cambridge, 1962). Caves found that small and large trunks had similar unit costs, while local service carriers had higher unit costs. The observed difference between trunk and local carrier average unit costs is explained by the lower density of service and shorter stage lengths for the locals, rather than any lack of constant returns to scale [D. W. Caves, L. R. Christensen, M. W. Tretheway, *Rand J. Econ.* **15**, 471 (winter 1984)].
5. There continues to be a concern about a potential adverse effect of competition on safety. The FAA routinely steps up its surveillance of any carrier whose financial condition is deteriorating. Published fatality statistics indicate that 4 of the 8 years since deregulation have been virtually fatality free for operators of jet equipment. In the highly competitive commuter industry, there has been an apparent improvement in safety since deregulation [D. P. Kaplan in (*1*), p. 71].
6. C. Winston, *J. Econ. Lit.* **23**, 57 (March 1985).
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8. R. G. Noll, *Am. Econ. Rev.* **75**, 52 (May 1985).
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10. S. Breyer, *Regulation and Its Reform* (Harvard Univ. Press, Cambridge, 1982); R. G. Noll, in *Telecommunications Today and Tomorrow*, E. Noam, Ed. (Harcourt Brace Jovanovich, San Diego, 1983), pp. 41–77.
11. For a nontechnical overview of contestable market theory and its usefulness in evaluating the consequences of deregulation, see E. E. Bailey and W. J. Baumol [*Yale J. Reg.* **1**, 111 (1984)]. For a technical description of the theory, see W. J. Baumol, J. C. Panzar, and R. D. Willig [*Contestable Markets and the Theory of Industry Structure* (Harcourt Brace Jovanovich, San Diego, 1982)].
12. Engineering studies have shown that the optimal service configuration using jet aircraft entails a hub-and-spoke route structure, such as described here [A. Kanafani and A. Ghobrial, *Trans. Eng. J. Am. Soc. Civil Eng.* **108**, 282 (1982)]. The extent of consolidation of carriers at hub airports is summarized by E. E. Bailey, D. R. Graham, and D. P. Kaplan [*Deregulating the Airlines* (MIT Press, Cambridge, 1985), p. 79].
13. The term "balkanization" was popularized by the productivity report, National Commission of Productivity and Council of Economic Advisors, *Improving Railroad Productivity* (Government Printing Office, Washington, DC, 1973). This report argued that the "balkanized structure has been a primary factor in preventing the industry from developing and implementing an industrywide strategy for responding to changes in the freight market" (p. 231).
14. For example, there was a merger between the Chessie System and Seaboard Coast Line Industries into CSX Corporation, and then between CSX Corporation and the barge company, American Commercial Line, Inc., to create a fully integrated shipping company. Other mega-mergers among railroads include the consolidation of Norfolk-Western and Southern Railroads into the Norfolk and Southern, and the merger of the Union Pacific group. The Sante Fe–Southern Pacific merger was recently disallowed by the ICC and the proposed Conrail–Norfolk and Southern consolidation was dropped.
15. T. G. Moore, *J. Law Econ.* **21**, 327 (1978). For an update, see N. L. Rose [*Rand J. Econ.* **16**, 299 (1985)].
16. T. G. Moore in (*1*), p. 52.
17. See E. E. Bailey, D. R. Graham, and D. P. Kaplan in (*12*), p. 95.
18. To cite two examples: captains of American Airlines 727-200's employed before November 1983 receive a maximum salary of $9057 per month, whereas those hired after that date are paid half as much; employees of Eastern Airlines were granted nearly 25% of the outstanding shares of the company in the fall of 1983 in return for concessions in wages and work rules. See D. P. Kaplan in (*1*), p. 59. For a study of total productivity improvement under deregulation, see D. Caves, L. Christensen, and M. Tretheway [*Regulation* (November–December 1982), pp. 25–28].
19. A study by Eastern Management Group, a New Jersey consulting firm, found four workers for each AT&T manager, compared with a nine-to-one ratio at major competitors. See W. B. Tunstall [*Disconnecting Parties* (McGraw-Hill, New York, 1985)] for a description of some of AT&T's efforts to streamline its workforce. A strike by CWA workers was called in mid-1986, but as with the Teamsters, major concessions were given, including the virtual elimination of annual cost-of-living provisions.
20. Starting in 1979, the number of purchased route authorities declined sharply (to nearly zero by 1982); but, even more significant, the value of the authorities fell by more than 80%, from more than $350,000 per transaction in the pre-reform years to about $55,000 by 1979. As the ICC began to grant more certificates, the number of licensed carriers grew from about 17,083 in 1979 to 25,722 by 1982. See Moore (*16*).
21. *ICC Annual Report* (Government Printing Office, Washington, DC, 1984).
22. Investigators argue that freedom to contract and hence to match financial commitments and risk should be encouraged. See, for example, J. R. Meyer and W. B. Tye [*Am. Econ. Rev.* **75**, 46 (May 1985)].
23. Interstate Commerce Commission, "Coal rate guidelines, nationwide" (Washington, DC, 3 August 1985), Ex Parte no. 347 (Sub-no. 1).
24. These increases are in line with the economic model of efficient delivery systems developed by Douglas and Miller (*3*).
25. Specifically, the pre-deregulation local service airline subsidy provided incentives for the local service carriers to offer linear route services during the off-hours (that is, midday or in the evening when the jets were not useful on business routes). With deregulation, commuter airlines replaced the locals at many small towns. The most effective way for the commuters to operate was to provide service with direct flights during business hours from the town to the nearest hub airport. The local service carriers adopted a similar operating pattern from larger towns to hubs. See S. A. Morrison and C. Winston [*The Economic Effects of Airline Deregulation* (Brookings Institution, Washington, DC, 1986)].
26. See, for example, D. Graham, D. P. Kaplan, D. Sibley [*Bell J. Econ.* **14**, 118 (spring 1983)]; G. D. Call and T. E. Keeler, in *Analytical Studies in Transport Economics*, A. F. Daughety, Ed. (Cambridge Univ. Press, Cambridge, 1985), pp. 221–247.
27. These estimates appear in L. J. Perl, "Social welfare and distribution consequences of cost-based telephone pricing" (National Economic Research Associates, White Plains, NY, 23 April 1985), p. 13, figure 3.
28. "Special report on telecommunications," *Wall Street J.*, 24 February 1986, p. 5D.
29. According to J. A. Gomez-Ibanez, C. V. Oster, Jr., and D. H. Picknell [*J. Polit. Anal. Manag.* **3**, 74 (1983)], the disastrous earnings downturn for the trunk airlines can be largely attributed to the recession and the 1979–80 run-up in fuel prices. The higher level of operating profit margins for the locals is attributed to fleet efficiencies. E. E. Bailey and J. R. Williams (in preparation) use analysis of variance techniques to indicate that the two carrier groups have different strategic profiles.
30. Examples of the former consolidations are those of Northwest and Republic, and of TWA and Ozark; examples of the later consolidations are proposed for Delta and Western, and for Continental and Eastern.
31. See J. R. Meyer and W. B. Tye in (*22*).
32. See (*21*).
33. Truck stocks have participated strongly in the recent rise in the stock market, and stocks of the major trucks are now selling at well above pre-deregulation highs. See Rose in (*15*).
34. The net profit margins of the seven regional phone companies during 1984–1985, tended to be in the 10 to 15% range [*Forbes*, 13 January 1986, pp. 210–211].

35. Much of the material in this article was gathered for the *OECD Economic Surveys 1985/1986: United States* (Organization for Economic Cooperation and Development, Paris, November 1985), pp. 67–84 and 120–124. We thank W. Baumol, T. Keeler, R. Noll, M. Sirbu, and an anonymous referee for helpful comments.