

cooperation is threatened when the local carrier becomes a rival of the long-distance carriers serving the local carrier's customers.

Further improvements in long-distance performance depends not on the entry of local carriers into long distance, but on providing long-distance carriers access to local networks on terms closer to actual cost. Long-distance service is more expensive than it should be because access charges are substantially above cost. The highest priority in long-distance policy should be the provision to long-distance carriers of economically efficient access to dispersed customers on reasonable terms. Improved competition in local service may be part of the answer. At least as important, however, is the requirement that existing local network components, particularly the local loops, be made available to all users on reasonable terms approximating cost.

I begin by reviewing and evaluating the points that Professors MacAvoy and Hausman offer to support their conclusion that the long-distance industry is uncompetitive. Next, I present an economic analysis concluding that the performance of the competitive long-distance market serves the consumer well. Then I discuss the effects of local-carrier entry into the long-distance market. Finally, I discuss alternative policies for lowering long-distance prices that are free from the dangers of vertical integration of local carriers; these include policies under which the resources of local carriers could compete in long distance.

## II. Summary

The following table summarizes points made by Professors Hausman and MacAvoy and gives a brief version of my responses:

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*Professor Hausman's Contention*

*My Reply*

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MCI and Sprint raise their prices after AT&T raises its prices, a sign of collusion

An analysis of pricing in long distance, with appropriate attention to the need to recover fixed costs associated with each customer, together with proper consideration of the effect of regulation on AT&T, shows that the co-movement of list prices has nothing to do with collusion. The fact that AT&T's price cap has remained binding is actually the result of strong competition in long distance, which has competed down the cost of incremental minutes of calling.

Residential long-distance prices have not fallen as much as access charges and transmission costs, so profit margins have increased.

Actual discounted prices have fallen more than access charges and transmission costs. The structure of long-distance pricing has evolved so that the list price, the price considered by Professor Hausman, has taken on the role of recovering fixed customer costs.

The failure of prices to fall when costs fall is a sign of lack of competition.

The relevant price has fallen more than cost, a sign of increasing competition.

Long-distance carriers charge different prices to different customers, and this price discrimination is a sign of market power.

Price differences are the result of cost differences; in competition, prices reflect cost differences.

Smaller customers pay list prices, so the analysis of long-distance pricing should consider list prices.

List prices must be understood in a framework where there are fixed customer costs—the changes in list prices observed recently are consistent with competition in

an industry that is evolving from prices strongly conditioned by regulation to free-market pricing.

Prices of cellular service have declined a little more than have long-distance prices.

The bulk of the decrease in long-distance prices resulting from improved competition occurred in the 1980s. Cellular, by contrast, is a market where competition has not advanced nearly as far and faces more rapidly changing determinants of price, including a forthcoming period of intensified competition. It is rising competition, not a high level of competition, that causes prices to fall.

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*Professor MacAvoy's Contention*

*My reply*

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The long-distance industry is concentrated; the three largest carriers account for the predominant share of revenue.  
Concentration leads to collusion.

A fourth large carrier, LDDS, now deserves to be considered along with AT&T, MCI, and Sprint. AT&T's market share is the result of the head start the firm received from the days of regulated monopoly. There are 44 facilities based long-distance carriers and 93 resellers. Both groups are ready to take business from the leaders if there is a profit opportunity.

Market shares are stable, another condition favoring collusion

Not true. AT&T's market share fell from 65 percent in 1990 to 55 percent in 1994. The smaller carriers are on the move—their share rose from 11 percent to 17 percent.

Rivals know each others' prices instantly,

List prices are known, but discount plans

also facilitating collusion

can be used to capture business by surprising rivals. In addition, smaller carriers can take business away with publicly announced prices, because it does not pay for the larger carriers to respond. The smaller carriers nibble continuously at the larger carriers' business.

There are substantial barriers to entry and large sunk costs for entrants in long distance, inhibiting competition by new entrants and facilitating collusion

Barriers are not high and many of the costs are not sunk. An entrant can obtain capacity in the flexible and active market for leased facilities. A firm that exits can sell or lease its capacity.

Long-distance profit margins are high and rising

False on both counts. Professor MacAvoy's measure of prices, based on list prices, overstates the level of prices seriously. It also understates the decline of prices resulting from the shifting of customers to discount plans. His measures of marginal cost grossly understate actual cost—they consider only the cost of access and the hardware costs of networks and ignore major categories of cost.

List prices are better measures of prices than is average revenue per minute

Rising discounts are the way that carriers have passed on to their customers the benefits of dramatic declines in the costs of incremental minutes of calling. List prices, on the other hand, have not fallen as much because pricing has shifted toward a format that charges customers efficiently for both the fixed and variable elements of the costs of serving them. Average revenue per minute is not the ideal measure of price, but

it is far superior to list prices in judging the performance of the industry.

The long-distance market is not contestable. Both key conditions for substantial contestability are satisfied. Sunk costs of entry are not high. The entrant can use discount plans and other forms of pricing to which the larger incumbents are not able or not inclined to respond. Hence entry will compete down price to the point where it just covers average cost.

MCI acts as if it controls the output of its rivals. It thinks that when it cuts back output to raise price, other carriers will also cut back as well, so the entire industry will enjoy higher prices. This preposterous finding illustrates the defects in the data on prices and costs that Professor MacAvoy uses throughout his analysis

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I will consider these points in turn. Before doing so, I will discuss some central issues of pricing that will arise in my evaluation of Professors Hausman and MacAvoy's work.

### III. Preliminary analysis of prices in the long-distance market

In my opinion, the competitive long-distance industry created by divestiture in 1984 has delivered substantial benefits to the U.S. consumer. The force of competition among the four major long-distance carriers (AT&T, LDDS, MCI, and Sprint) and dozens of other significant carriers has pushed prices down to the level where only an efficient firm with perceptive management can make a profit. But competition in long distance does not take the precise form of textbook perfect competition. An evaluation of the performance of the industry based on the behavior of prices, as undertaken by Professors Hausman and MacAvoy, needs to be carried out within a framework that takes account of the nature of the product and of the costs of delivering it to customers

The quickly developing market for access to the internet provides a useful standard of comparison in evaluating the performance of the long-distance industry. By any standard, the internet access market is competitive. No single supplier has a large market share. There are no important barriers to entry. Large customers can purchase the services required for access separately by component. Small customers—for example, individuals who want to dial up the internet from home using a personal computer—can obtain software and local telephone access from numerous vendors who typically charge a flat fee of about \$20 per month, independent of the actual amount of use. And customers with intermediate needs can select from many other offerings. Pricing almost always has a large fixed element and small variable element. Although one might argue that internet access is a homogeneous product, the price paid for access varies widely across customers, despite the competitive organization of the market.

Pricing in the internet access market has developed in a setting completely free of regulation and largely outside the influence of any earlier customs. Long distance, by contrast, emerged from tight regulation only 12 years ago, and even today, most residential customers are billed for long distance on the same bill as for regulated local service. Hence the pricing conventions for long distance appear to be quite different from those for internet access. I think it is fair to predict that residential pricing for long distance would look much more like pricing for internet access if long distance did not have its regulatory heritage. Customers would pay an overt basic monthly charge and also some per-minute charge. Economists refer to prices in this form as “two-part prices” and have commented extensively on how this form of pricing contributes to economic efficiency.

Quantity discounts provide essentially the same results as overt two-part pricing. Discounts for heavier users are rampant in the residential and small business long-distance markets. In my opinion, discounts should not be seen as “price discrimination” practiced as an exercise in market power. Rather, they are one of the ways that the fixed cost of service can be collected from customers under competition. The other way—so conspicuous in the internet access market—is the overt monthly charge.

For larger business customers, the pricing of long distance already looks just like the pricing of internet access; in fact, the two services share many communications components. Large customer connect to the long-distance carrier’s network through

dedicated lines and keep track themselves of their use of the bulk capacity they purchase. By relieving the carrier of most of its costs, the large customer is able to buy bulk capacity at an extraordinarily low price. Again, the comparison of the price of bulk long-distance service to the list price of dialup service (where the list price actually covers mostly fixed cost) reveals nothing about the state of competition. It speaks only to the cost structure.

#### IV. Evaluation of Professor Hausman's Analysis

##### A. Co-movement of list prices for long distance

Professor Hausman, in Exhibit 2 of his declaration, shows that MCI and Sprint raise their list prices by similar amounts when AT&T raises its list price. Moreover, Professor Hausman points out that some of the AT&T increases were permitted by the FCC because of changes in accounting, not economic costs. He interprets this pattern of behavior as a sign of coordination among firms with a strategic relationship, which he believes is inconsistent with perfect competition.

In the first place, the conclusion that AT&T, MCI, and Sprint have a strategic relationship is not surprising and cannot form the basis for conclusions about the performance of the industry. In any market that departs even a little from textbook pure competition, especially one where four sellers account for the preponderance of sales, the leading sellers will respond to each other's prices. Even pure competition implies that one firm responds to the prices of other firms—in pure competition, if other firms raise their prices, one firm *automatically* raises its price. It is a familiar conundrum of the analysis of market structure that prices move in parallel in both competition and collusion.

Second, and most important, Professor Hausman's discussion is devoid of any reference to the role of regulation. AT&T raised its list prices on the occasions noted by Professor Hausman because price-cap regulations permitted them to make the move. In other words, the price cap was a binding constraint—AT&T perceived that it could make more profit by raising its list price above the level previously permitted by the price cap. And MCI and Sprint, not subject themselves to the price cap, perceived that it was in their interests to raise their list prices as well.

Does the fact that the price cap was a binding constraint mean that the dramatic lowering of long-distance prices since divestiture was purely the result of lower price caps? Not at all. The price cap applies to list prices. The actual price of long-distance service—the amount paid for the average minute of service—is way below the price cap and has been falling relative to the price cap continuously since price caps were instituted. The role of the list price can be understood within the framework I outlined above. Competition forces the pricing of long-distance service to reflect the actual cost of service, including the fixed cost. A seller who recovers fixed cost by overpricing usage will lose larger customers to rivals whose price per minute of use is closer to cost. Thus competition shifts pricing toward the formulas seen in the internet access market, with explicit or implicit fixed charges.

In the long-distance business, as I noted earlier, quantity discounts are used to create implicit fixed charges to customers. Absent explicit fixed charges, competition will take the form of high list prices and substantial quantity discounts. And that is why AT&T chose to keep its list price at the price cap, while at the same time dramatically lowering the average price of long-distance service.

I conclude that the facts pointed out by Professor Hausman have exactly the opposite implication from what he suggests—strong competition in long distance forced AT&T to meet rivals' prices for minutes of use. In order to keep the price of service to smaller customers at its competitive level, rather than let it drop to an unremunerative level, AT&T raised its list prices, whose main function is to impose a fixed charge on its customers.

## **B. The relation between access charges and long-distance prices**

Professor Hausman, in his Exhibit 3, shows that access prices have declined substantially since 1990. He also notes that the cost of fiber optic transmission has fallen. He asserts, without documentation, that residential long-distance prices have not fallen to reflect these cost decreases. It is true that the residential list prices of AT&T, MCI, and Sprint rose somewhat during this period. Hausman concludes “This outcome is another indication of non-competitive behavior” (§16)

The data cited by Hausman tell us nothing about competition in long distance. In the first place, basic economics holds that the prices of firms with market power respond to costs

just as strongly as do the prices of competitive firms. The monopolist marks up costs and so does the competitor. The failure of prices to fall when costs fall would be as much a paradox for a concentrated industry as for a competitive industry. Confronted with that paradox, the economist should ask whether costs are measured correctly and whether prices are measured correctly.

As I pointed out earlier, the costs that are most relevant for considering the behavior of list prices are the fixed costs of serving customers. The fixed costs do not depend on either access or transmission charges. Hence one would not expect to find list prices declining when access and transmission costs fall. We should be looking at the fixed costs, which include costs of billing, customer service, marketing, and the like. There is every reason to believe that these costs have risen since 1990

Later in this study I will present data that I believe are more relevant for the issue raised by Professor Hausman, the relation between access charges and long-distance prices. I will use average revenue per minute as a measure of price. These data show that the long-distance customer has benefited fully from lower access charges. However, I do not draw conclusions about competition from this finding, as firms with market power would also pass along cost reductions

### C. Price differentials for long distance

As Professor Hausman notes, only a firm with market power will set different prices for the same product (produced and delivered with the same cost) to different customers. On the other hand, where price differentials reflect differences in costs, they tell nothing about market power—as I noted above, firms with and without market power set prices to reflect cost differences

Professor Hausman notes that long-distance carriers do not pay originating access charges for their cellular customers, though they typically do pay terminating access charges and originating transport charges. Professor Hausman estimates the cost differential as about 1.8 cents per minute. He states that long-distance carriers do not charge correspondingly lower prices for long-distance service to cellular customers. He calls this a textbook example of price discrimination.

However, Professor Hausman does not provide a complete analysis of cost differences between cellular and landline customers. In particular, his analysis is devoid of any consideration of implicit two-part pricing, whose importance I have emphasized earlier. It is my understanding that cellular customers generally make substantially fewer long-distance calls than other customers. The cost difference cited by Professor Hausman is small in comparison to the difference between list prices for long distance and actual revenue per minute. Hence the lack of a price difference between cellular and landline long distance seems completely explicable in terms of cost differences and not an example of price discrimination at all.

Professor Hausman states that AirTouch, after spinoff from Pacific Telesis, set prices that were 50 percent below an unstated standard (presumably something like AT&T's list price). He cites this development as confirming his conclusion that the independent long-distance carriers are engaged in price discrimination not based on cost. In the first place, Hausman appears to make an inappropriate comparison by failing to consider discounts available from long-distance carriers serving cellular customers. MCI, for example, offers cellular subscribers exactly the same discount plans as other subscribers. Hence, the price differential Hausman cites is the result of comparing discount plans offered by a vertically integrated cellular carrier to the list prices of long-distance. Moreover, he fails to consider the difference between a new entrant, AirTouch, and the incumbents. In a market such as long distance, the process of entry is typically accomplished through low initial prices. It would be easy to find many examples of other new carriers, entering at the same scale as AirTouch, who used the same strategy.

#### D. Behavior of long-distance prices

Earlier critics of Professor Hausman's work on behalf of the BOCs have pointed out that Hausman relies on list prices in reaching conclusions about the performance of the long-distance industry, rather than studying the prices customers actually pay. He notes that smaller customers often pay list prices; discounts are concentrated among high-volume users.<sup>1</sup> I believe he is incorrect in concluding the list prices should therefore be the

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<sup>1</sup> There appears to be an important factual error in his discussion of the role of discounts in paragraph 22. He states that the PNR data show that 36 percent of long distance calls on AT&T were under discount plans. In paragraph 27, referring to the same data, he reports that 40 percent of At&T's customer were on discount plans. Because customers on discount plans make a disproportionate share of calls, these

exclusive focus of analysis. Instead, I believe that the approach outlined earlier is required, in which discounts serve the role of separating the pricing of the service itself from the pricing of incremental minutes of use. As competition has altered pricing from its heritage of one-part pricing under regulation, the result has been to raise list prices and lower the incremental prices of calls. Professor Hausman's attempt to interpret list prices as if they were the only aspect of pricing misleads him seriously. The finding of rising list prices he notes in paragraph 22 is a sign of the effectiveness of competition. To give a complete picture, he should also cite the large declines in the prices of incremental minutes of use that took place over the same period

Professor Hausman also cites data from the consumer price index and the producer price index for the price of long distance. He notes that these indexes have risen modestly since 1990. However, he does not discuss the methods that the Bureau of Labor Statistics uses to compute these indexes. Until recently they were calculated exclusively from list prices and did not reflect discounts at all. That is, they add almost nothing to the data Professor Hausman offered earlier on list prices. The Bureau of Labor Statistics has recently developed to include data on actual prices paid, but this change will not affect historical values of the indexes

Professor Hausman briefly discusses data on average revenue per minute. He notes that this measure of long-distance prices fell somewhat since 1990, but not by as much as access charges. I will present detailed data on this issue later in this study. Hausman concludes on this point " . . . we know that IXC costs decreased over this period. Increasing revenue per minute with decreasing cost demonstrates the uncompetitive outcome in the long distance market" (§25). This statement is erroneous in three important ways. First, the data cited by Hausman do not show rising revenue per minute; earlier in the same paragraph he notes that my measure decreased from 1990 to 1993 and his own study shows a decline from 1994 to 1995. Second, Hausman has done no study of the total costs of long distance and has no basis for the claim that costs have decreased. Long-distance carriers have many other costs beyond the two categories he has examined, access and transmission. Third, as I pointed out earlier, it is basic economics that uncompetitive

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numbers are flatly contradictory. Professors B. Douglas Bernheim and Robert Willig pointed out the same glaring defect in the PNR data last year (*Reply Affidavit*, Civil Matter No. 82-0192, August 27, 1995, p. 125), but Hausman has not responded to their criticism, to my knowledge.

sellers base price on cost fully as much as competitive ones—a finding of rising prices in the face of lower costs is a paradox, not a diagnosis of failure of competition. The logical conclusion is that there are problems in the measures of price and cost used by Professor Hausman.

#### **E. Professor Hausman's study of a sample of residential bills**

Professor Hausman examines a sample of residential long-distance bills that confirms the decline in AT&T's revenue per minute for residential service between 1994 and 1995. When he breaks down the decline into changes in revenue per minute for discount plans and for customers paying list price, he also confirms the basic trend in long-distance pricing I noted earlier. The shift toward more effective two-part pricing caused customers who did not use discounts to experience increases in their bills per minute of use.

#### **F. Comparison of long-distance prices to cellular prices**

Professor Hausman notes that the decline in cellular prices between 1994 and 1995 was slightly greater than the decline in long-distance prices. As he notes, cellular telephony will soon be facing a large increment in competition, as did long distance starting in 1984. Other factors not considered in his analysis, such as increases in the elasticity of demand perceived by cellular carriers, are also likely to be responsible for the decline in cellular prices. The mid-1980s saw extremely large reductions in long-distance prices thanks to rapid growth in competition. By 1990, the benefits of rising competition had largely occurred. We learn nothing by comparing rapidly changing cellular market to the stable competitive situation in long distance. Further, prices in all types of markets are strongly influenced by costs, and Professor Hausman reports no results comparing the change in total cellular costs to the change in total long-distance costs.

#### **G. Benefits of BOC entry to long distance**

Professor Hausman endorses proposals to allow the BOCs to enter long distance. He concludes that "Increasing the number of facilities-based carriers is almost certain to solve the problem as the experience of the steel industry, auto industry, and many other non-competitive oligopolies has demonstrated in recent U S economic history." (§34). He jumps to the conclusion that BOC entry would increase the number of long-distance carriers. Here he departs from the standard, basic analysis of the number of sellers in a

market accepted by almost all economists. Firms enter markets because they perceive that the profits available will more than compensate their shareholders for the costs of entry. The equilibrium number of sellers is achieved when the prospective entrant finds that profits are inadequate to cover the costs of entry. If one or more of the BOCs enter the market, they will reduce the profit perceived by other entrants. It is a basic result of this theory that entry by one firm has no effect at all on the equilibrium number of sellers. Hence there is no support in economic analysis for Professor Hausman's implicit assumption that entry by a BOC will raise the number of long-distance competitors.

Professor Hausman is oblivious to the profound question about the desirability of permitting the BOCs to sell long-distance services that was reflected first in the Modification of Final Judgment and now in the Telecommunications Act of 1996. Based on AT&T's treatment of its long-distance rivals before 1982, the MFJ forbade the BOCs from serving as both the suppliers of local access and competitors in long distance. History suggested that the BOCs would continue AT&T's policies of hobbling long-distance rivals through control of local facilities. The new Act reflects the same concern, but recognizes that competition in local facilities may eventually be an adequate alternative safeguard for the interests of long-distance consumers. Professor Hausman fails to address this profound question at all.

## V. Evaluation of Professor MacAvoy's Analysis

Professor MacAvoy has submitted both an affidavit and the draft of his book on long-distance competition.<sup>2</sup> My comments will be directed to both.

### A. Structure and competition

Professor MacAvoy's affidavit lists five structural conditions he believes predisposes a market to non-competitive behavior and asserts that the long-distance market fulfills all five conditions.

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<sup>2</sup> *Affidavit of Paul W. MacAvoy on behalf of BellSouth Corporation*, Federal Communications Commission, CC Docket No. 96-61, April 24, 1996 (hereafter, *Affidavit*), and *The Failure of Antitrust and Regulation to Establish Competition in Markets for Long-Distance Telephone Service*, American Enterprise Institute and the MIT Press, forthcoming (hereafter, *Failure*).

## 1. Concentration

Professor MacAvoy's first condition is that the market have a small number of firms of substantial size. He notes that the three largest carriers accounted for the predominant share of revenue in 1994. He fails to note that the market contains a number of other aggressive, successful carriers who have every intention of taking as much business as they can away from AT&T, MCI, and Sprint and surpassing these sellers one by one. As of 1996, it is no longer appropriate to speak of the market as if these three carriers were the only ones that matter. LDDS is closing fast on Sprint and deserves even today to be added to the list of influential forces in the market. Executives in the industry who are constantly fighting to retain customers solicited by LDDS would be amused at Professor MacAvoy's portrayal of their industry as a comfortable club with just three members who have agreed not to poach on each other's territories.

LDDS is now the fourth largest long-distance carrier with nearly three million customers (presubscribed lines) as of the beginning of 1995. It has grown both by building its own facilities and by acquisition of other carriers. In January of 1995 LDDS acquired Wiltel, the sixth largest carrier. Currently, LDDS has about a five percent market share of the long-distance market.

Allnet is the fifth largest carrier with nearly 1.5 million customers as of the end of 1994. Allnet has achieved its growth as a reseller. In 1995 Frontier Communications acquired Allnet's parent. Their combined market share is about three percent of the market.

These two firms are just two of the many players who are aggressively challenging AT&T, MCI, and Sprint. At present, there are 44 facilities-based long-distance carriers and 93 resellers who are actively recruiting customers.

No one disputes that AT&T retains a major share of the long-distance business. By standard measures, the long-distance market is concentrated. But most economists agree that concentration alone does not adequately predict competition and performance. This proposition is especially true where, as here, one seller—AT&T—started from a completely dominant position. The swift decline in AT&T's market share following divestiture, as documented in Professor MacAvoy's study, is a sign of vigorous competition.

## 2. Stability of market shares

Professor MacAvoy's second condition is stability of market shares. He writes "During the period 1990 to the present, the decline in AT&T's market share slowed and the shares of the three carriers stabilized." (*Affidavit*, p. 3). This statement does not do justice to the facts. AT&T continues to face challenges from low-price, high-quality rivals including not only MCI and Sprint, but also newer rivals, such as LDDS and Frontier, whose shares have grown rapidly in the last few years. Although AT&T has retained its majority share of the market, it has done so by behaving like a highly competitive rival in a less concentrated market. Moreover, AT&T's share of the market, when measured by revenues, continues to fall. Based on the, AT&T's market share has consistently fallen. As of 1990, AT&T's market share was 65 percent; by 1994, its market share had fallen to 55 percent.<sup>3</sup> Much of its loss in market share has gone to LDDS and carriers other than MCI and Sprint. In 1990, carriers other than AT&T, MCI, and Sprint had about 11 percent of the long distance service revenues; as of 1994 they had more than 17 percent.

The latest data show plainly that Professor MacAvoy's assertion is simply wrong that the market shares of the three major carriers are stable. Continuing declines of AT&T's market share and growth of new entrants shows, on the contrary, vigorous competition.

## 3. Communication of prices to rivals

Professor MacAvoy's third condition is that rivals' prices are readily observable to one another. Of course, a carrier's basic list prices for long-distance calls are public knowledge; Professors MacAvoy and Hausman both point out that list prices would be public knowledge even without the filing of tariffs. Economic analysis of the relation between competition and rivals' observation of price has stressed that the central question is whether a firm can take its rivals by surprise by offering terms to prospective customers that the rivals cannot match immediately. If a smaller firm can attract a significant number of customers before its rivals respond, competition is enhanced because the firm can expand relative to its larger rival or rivals. Even a one-day advantage can be crucial—in the airline business, one carrier can run a media blitz for a special discount offer for a single day and book a large amount of business, even if the other carriers respond with

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<sup>3</sup> FCC, *Statistics of Common Carriers, 1995*

their own blitzes the next day. In the residential long-distance business, the primary tool is the signup bonus. The larger carriers target their rivals periodically with mass mailings offering bonuses—the rivals only learn about the tactic after it occurs. Promotional and discount offerings come at such a fast and furious pace that rivals cannot respond quickly enough to erase the temporary advantage that each offer provides to the carrier making the offer.

The observability of prices by rivals is a significant issue in markets with high barriers to entry and small numbers of firms. But in the long-distance market, with over a hundred sellers, a smaller seller need not fear that its larger rivals will respond to the prices it sets. The small firm can publicize its prices as widely as it chooses. Smaller firms find viable niches in the market, knowing that larger rivals would sacrifice too much profit from their existing customers if they matched the terms that were being offered by small firm to a few of its customers. For example, Delta Airlines has recently entered the long-distance market for credit card calls, offering readers of its inflight magazine better prices than are generally available in this niche of the market from the large long-distance carriers. The combined effect of the hundred or so smaller carriers, each nibbling at the shares of the larger carriers, is to enforce a high level of competition in the market in general.

#### 4. Product similarities

Professor MacAvoy's next condition is the similarity of products, both to the consumer and in terms of their costs of production. This condition receives no further consideration in his discussion, nor is it given much stress in analysis of competition by other economists. If the offering of identical products by all sellers inhibited competition, our leading textbook example of perfect competition—the grain market—would be a hotbed of collusion instead.

#### 5. Barriers to entry

Professor MacAvoy's last condition, the existence of barriers to entry, is prominent in all discussions of structural determinants of competition. If a small number of sellers are isolated from further competition by high barriers to entry, the likelihood of implicit collusion is higher. Professor MacAvoy claims that the basic transmission technology of modern long-distance service—fiber optics—has high fixed and low variable costs. In other words, a long-distance carrier must make a large investment to be in business in the

first place, but can then increase its volume of business without adding much capacity or incurring additional costs that rise with volume. Professor MacAvoy presents no data to support this assertion.

Professor MacAvoy fails to consider the flexibility of long-distance operations. In particular, the ownership of facilities and the provision of long-distance service are not linked in the way that his analysis assumes. The United States has an active market in leased communications facilities that supports a much more flexible industry with essentially constant returns to scale. The market easily supports active competition among many long-distance carriers.

Most importantly, provision of national service does not require the ownership of a full national network. If uncompetitive behavior among the larger carriers created excessive prices, the resulting profit opportunity would be seized by operators who already know how to assemble an effective national service from components available today in the lease market.

Analyses of barriers to entry have stressed the importance of sunk costs, rather than the total costs of entry. A sunk cost is one that cannot be recovered if entry is not successful. Few of the costs of transmission capacity in the long-distance business are sunk, because there is an active market where an unsuccessful entrant in retail long distance could sell or lease facilities to other retail sellers.

## 6. Excess capacity

Although excess capacity does not appear explicitly on Professor MacAvoy's list of conditions, he clearly considers capacity to be a factor in long-distance competition. While carriers appear to have unused capacity much of the time, this capacity is essential because they must handle surges in traffic, some predictable and some random. Much of the time, the incremental cost to carry one more call is at a low level. But the relevant criterion with respect to competition is whether the cost of increasing the overall scale of the system is low. Common sense suggests it is not, and Professor MacAvoy presents no evidence to the contrary.

Long-distance carriers make substantial investments each year to expand and enhance their networks. From 1992 to 1994, MCI has spent 1.5 billion dollars—more than doubling its

investment in its network—so that its network can keep pace with the increase in call volumes. Since 1992, MCI has more than tripled its total capacity circuit miles. These investments are not characteristic of a firm with excess capacity, but rather of a firm expanding in response to increased demand.

## 7. Returns to scale

This factor also does not appear on Professor MacAvoy's list, but is important in his discussion in his book, which asserts that long-distance has important returns to scale. All the evidence suggests otherwise. AT&T is approximately three times larger than MCI. Under returns to scale, AT&T should have substantially lower costs per minute of service and thus higher profits. But, in fact, AT&T and MCI are about equally profitable. Further, many carriers exist in the market which are much smaller than MCI, and these small carriers are not only viable, but profitable and growing.

## B. Professor MacAvoy's conclusion on competition and collusion

Based on the factors I just discussed and on evidence to be discussed below, Professor MacAvoy concludes that the long-distance industry is distinctly non-competitive. The particular form of non-competitive organization that he diagnoses is tacit collusion. In his view, each long-distance carrier is willing to stick to high prices because there is an understanding that the others will keep their prices high as well. However, Professor MacAvoy cites no evidence of actual collusion. His diagnosis of tacit collusion makes little sense for an industry with numerous sellers, many of whom are small enough to avoid any strategic response from the four major sellers, but collectively large enough to exploit any gap between price and cost.

## C. Professor MacAvoy's review of studies of long-distance competition

### 1. Professor MacAvoy's own studies

In his book, Professor MacAvoy analyzes the price-cost margin for long distance during the last decade and finds that the margin has risen.<sup>4</sup> But, as he recognizes, this result runs contrary to what standard economic principles would dictate during a time period when market concentration was actually falling. Rather than determine the source of this

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<sup>4</sup> *Failure*, Chapter 5.

paradox, Professor MacAvoy takes the finding literally and ultimately reaches absurd conclusions from it (see section D below, “Professor MacAvoy’s conclusion that MCI believes it controls market output”).

This paradox, however, is explained not by a breakdown in standard economic theory, but by two critical mistakes Professor MacAvoy makes in his analysis: 1) relying on a defective measure of marginal cost; and 2) relying on price measures that fail to capture most of the declines in long-distance prices that have occurred since 1984.

a) *Marginal Cost*

Professor MacAvoy relies, in part, on data presented by the WEFA Group in *Economic Impact of Eliminating the Line-of-Business Restrictions on the Bell Companies*,<sup>5</sup> for his data on the marginal cost of long-distance service. In my opinion, WEFA’s attempt to measure marginal cost bears little relation to the concept of marginal cost relevant for the comparison to price and the measurement of profit margins. WEFA estimates that the incremental cost of an additional message minute is no more than \$.01 per minute. Adding this to a measure of access cost, WEFA computes a total marginal cost of \$.065. This calculation is equivalent to measuring the marginal cost of a shoe from the wholesale cost of its leather. WEFA omits almost all the elements of cost that account for employment in the long-distance industry. According to WEFA, then, a long-distance carrier never has to sell its products, never has to bill a customer, and never has to handle a customer service call.

WEFA’s estimate of cost is paradoxical in view of the reported costs of the long-distance carriers. WEFA offers no hint as to why reported costs are more than twice as high as WEFA’s estimate of cost. The gap is inexplicable, considering that the carriers are operated on behalf of their shareholders, and these shareholders would certainly protest such a large gap between actual and potential cost.

WEFA’s cost estimate therefore fails every test of reasonability. Professor MacAvoy relied on WEFA estimates in the earlier version of his study, filed on behalf of the Bell Operating Companies well over a year ago.<sup>6</sup> In his latest version, Professor MacAvoy

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<sup>5</sup> WEFA Group, undated.

<sup>6</sup> *Affidavit of Paul W. MacAvoy*, Civil Action No. 82-0192, July 1994.

repeats his reliance without responding in any way to my criticisms, which have been available to him since December 1994<sup>7</sup>

Professor MacAvoy fails to analyze cost changes by product. In particular, billing costs vary considerably from one product to another primarily because the costs to bill an individual customer are so high. Failure to consider differences in costs distorts Professor MacAvoy's price-cost margin analysis. According to MCI, if there is no call on an invoice, the additional billing cost of a call exceeds 45 cents. By contrast, if the number of calls on an invoice is 30, then the additional billing cost is slightly more than 3 cents

*b) Price measurement*

The second critical mistake Professor MacAvoy makes in his analysis of the price-cost margin is in relying primarily on list prices (tariffed rates point to point). List prices completely miss the discounting that accounts for a substantial and important part of the actual price declines in the long-distance industry. Although Professor MacAvoy discusses discounts in his price calculation, the way he incorporates their effect into his price indexes fails to recognize that consumers have moved toward increasing use of discounted services.<sup>8</sup> Ignoring these shifts across products seriously understates the decline in price per minute.

*c) Price-cost margins*

Making useful inferences about industry performance from the relation of price to marginal cost is a challenge. Although the textbook perfectly competitive industry has marginal cost equal to price, it is difficult to relate departures from that equality into a suitable measure of performance. An industry could have marginal cost below price but still be workably competitive. In such an industry, the potential entrant would not perceive profit and there would be no social benefit from entry. Professor MacAvoy's single-minded attention to price-cost margins is inappropriate as a matter of economic analysis.

Professor MacAvoy concludes that long-distance price-cost margins are high and rising. He is incorrect on both counts. His use of list prices and his exclusion of the full effect of

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<sup>7</sup> Declaration of Robert E. Hall, Civil Action No. 82-0192, December 2, 1994

<sup>8</sup> Professor Hausman's declaration clearly documents the shift to discount plans, which is central to understanding long-distance pricing (Declaration, ¶28, p 16)

discounts overstates the levels of prices. A comparison of Professor MacAvoy's measures of prices per minute with the actual revenue per minute earned by long-distance companies, which falls far short of Professor MacAvoy's price level, confirms this overstatement. His omission of many important categories of cost cause him to understate marginal cost. Consequently, he considerably overstates the price-cost margin. The same errors disable his data on the change in margins over time. Because discounts are more important than in earlier years, his neglect of the changing use of discounts over time causes him to conclude that margins are rising. Similarly, his omission of categories of cost that have risen results in an overstatement of the change in margins. Even more serious is his failure to include billing costs, a cost that varies dramatically with usage. This failure compromises his analysis particularly with respect to residential customers.

Professor MacAvoy cites research of mine on the measurement of price-cost margins.<sup>9</sup> He writes (*Affidavit*, p. 22) "... Professor Hall failed to take note of the level of AT&T's price-cost margins, which are higher than those in his published works that he describes as non-competitive." The price-cost margin for AT&T developed by Professor MacAvoy bears no relation to the method developed in my research—as I have noted earlier, he uses only selected categories that exclude important elements of cost. My method incorporates all components of cost. Further, my work has never reached conclusions about the level of competition or the performance of any market or industry based solely on my measure of the price-cost margin. Rather, the conclusion, as stated in the last sentence of the paper, is "... I find the evidence against pure competition reasonably convincing." It is unreasonable to suggest that this line of research has developed a single numerical standard for determining when an industry is non-competitive. Only a few agricultural markets are perfectly or purely competitive. The finding that price generally exceeds marginal cost is just the starting point for reaching conclusions about competition. All the other factors I discuss in this report need close attention before a conclusion is merited.

Professor MacAvoy's conclusion that prices far exceed cost is paradoxical in view of the lack of barriers to entry in long distance. If true, Professor MacAvoy's margin estimate would dictate that every business with any expertise in communications would be rushing into an industry where output can be sold for almost three times its cost. Although many

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<sup>9</sup> "The Relation between Price and marginal Cost in U.S. Industry" *Journal of Political Economy*, 96:921-947, 1988.

new companies are in the process of developing their long-distance businesses, the industry is not experiencing the flood of market entrants that Professor MacAvoy's wide profit margin would predict

To summarize, Professor MacAvoy only measures the spread between list price per minute and the cost of access and transmission. He ignores the large gap between list prices and actual revenue and ignores another large gap between total marginal cost and access and transmission cost. He basically assumes the remaining costs to be zero.

Correct measures of price and cost changes show that the price-cost margin has actually *declined* in the long-distance industry in the past decade, as I will show in a later section. This decline is consistent with increasing competition. This finding also resolves Professor MacAvoy's paradox, described earlier, because, as predicted by standard economic analysis, the price-cost margin fell during the same period that concentration was falling.

## 2. Professor MacAvoy's study of California long-distance prices with Doane and Williams

Professor MacAvoy cites a paper he wrote jointly with Michael J. Doane and Michael A. Williams on long-distance prices in California.<sup>10</sup> A request to Professor MacAvoy's office resulted in a different paper, "Policy versus Reality in Establishing Competition in California Long Distance Telephone Service Markets" which does not contain the material summarized in the *Affidavit*. Professor MacAvoy's office has stated that the cited paper is not available. Hence I am unable to evaluate his claim that California long-distance prices have not fallen in relation to access charges.

## 3. Pablo Spiller's study

Professor MacAvoy endorses Professor Pablo analysis based on event studies in the stock market.<sup>11</sup> He uses the change in market value for different telephone companies not directly involved in the event as a basis for computing welfare losses. He reviews three types of events.

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<sup>10</sup> Cited as *Policy and Competitiveness Issues in California Long Distance Telephone Service Markets*, Working Paper Series C, No. 39, Yale School of Management.

<sup>11</sup> *Affidavit of Pablo T. Spiller, Appendix Volume II, Motion of Bell Atlantic Corporation and Others to Vacate the Decree, Civil Action No. 82-0192.*

The first type of event signals an increase in long-distance competition. The particular event under consideration is British Telecom's investment in MCI. Professor Spiller computes the loss in market value of the other long-distance carriers that occurred at the time of the announcement of the investment. From the loss in public value, he infers a lower bound on foregone consumer welfare from the prohibition of vertical integration by the BOCs into the long-distance market.

The second type of event is one that combines a long-distance carrier with a local service provider. As before, Professor Spiller computes the loss in market value for the firms that are adversely affected, both long-distance carriers and local service providers. From the sum of the losses for these firms, he then infers a lower bound for consumer welfare foregone because the BOCs have been prevented from integrating vertically into long distance. He looks at two such events. The first is the AT&T-McCaw merger. The second is MCI's announcement of plans to compete in the access market.

The third type of event concerns the merger of a BOC with a cable operator. The first such event, the Time Warner-US West merger, occurred prior to the flurry of announcements about proposals to lift the MFJ. The second such event, the Cox-Southwestern Bell merger, occurred after the flurry. Professor Spiller computes the difference in market value changes for the long-distance carriers, the non-BOCs, and the BOCs. From the sum of these differences, he infers a lower bound for consumer welfare foregone because of the MFJ's restrictions.

I do not believe that Professor Spiller's measures can reasonably be interpreted as bounds on foregone consumer welfare. In the first place, Professor Spiller attributes changes in value to the MFJ restrictions which appear to arise from quite different sources. For example, MCI's investment in local exchange service would surely cause a loss in value for the BOCs, because MCI plans to compete directly with them. But the loss in the public value of the BOCs comes from the dilution of the BOCs' market power in the access market. Nothing in the MFJ reduced or eliminated that market power. Professor Spiller seems to attribute reduction in access charges to the lifting of the MFJ, when in fact access charges depend on regulatory decisions and competition in local markets not affected by the MFJ. In my opinion, a similar announcement absent the MFJ would have had the same impact on the BOCs

Second, Professor Spiller attributes all of the loss in BOC value from these events to price effects and fails to consider the effects of the diversion of profitable business that occurs as a result of the events. This error can be seen from his Figure 1. He assumes that the only impact of an event such as MCI's entry into the access market on the demand for the services of the BOCs is to lower price. What in fact would occur is there would be a reduction in price as well as a reduction in demand because a competitor had entered the market. Thus, the BOCs are now sharing their market with another player. In economic terms, Professor Spiller has assumed all changes are along the demand curve. He has ignored the shift of the demand curve. The former represents an increase in consumer welfare, the latter represents, in this case, gains to a competitor.

Third, the effects of the events considered by Professor Spiller are trivial, and are much smaller than the effects of other events not considered in his analysis. Except possibly for MCI's announcement, none of these events had a visible impact on the stock prices of the BOCs. Moreover, there are other events with a much more substantial impact on the BOCs. Professor Spiller makes a great deal out of changes that are too small to see in a simple plot of the data.

In my opinion, Professor Spiller has not succeeded in measuring potential welfare gains from vertical integration of the BOCs into long distance. Most of his findings demonstrate the major benefit that consumers would achieve from lowering access charges and do not touch on the issue of vertical integration.

#### 4. The use of average revenue per minute to measure long-distance prices

Professors R. Glenn Hubbard and William Lehr's analysis for AT&T and my own work for MCI have concluded that the best available measure of the price of long distance service is the average revenue per minute earned by long-distance carriers. The primary reason is that customers have enjoyed large price reductions by switching from paying list price to plans with large discounts. Authors, such as Professor MacAvoy, who treat list-price service and discounted service as separate products fail to record the benefit to consumers of switching to discount plans.

Professor MacAvoy makes three criticisms of the use of average revenue per minute to summarize trends in long-distance prices: (a) Carriers presumably charge what is specified in their tariffs, so to figure out the cost of a call, one should look at the standard tariff; (b)

carriers don't charge average revenue per minute, (c) average revenue per minute does not control for changes in the mix of calls by distance, time of day, or length.

a) *Standard tariffs specify the actual prices of calls*

This statement is simply incorrect. For example, Pacific Bell's billing for AT&T's long distance charges bears the legend, "Charges in the Amount column are informational. See Summary for actual charges". The Amount column gives the tariffed list prices. A 10-minute call to Washington, DC is shown at the standard tariffed rate of \$3.00, but the actual charge for the call in the summary is only \$1.95. Professor MacAvoy is making a very significant error in using standard tariffed rates as if they were prices, without considering discounts. It is axiomatic almost everywhere in the U.S. economy that actual transaction prices are well below list prices. This is particularly true for long-distance.

Of course, a substantial fraction of customers (but not a substantial fraction of calls) are paying list price, because the cost of serving them is dominated by the fixed component, as I explained earlier.

Although average revenue per minute is far superior to tariffed list prices in measuring the price of long distance, it would be even better if we could separate the two components of pricing. If we knew separately what actual implicit fixed monthly charge customers were paying, and what actual incremental price per minute of calling, we would be even better informed. But, lacking such information, we are better off looking at average revenue per minute, which is derived from what people actually pay, rather than relying on the fiction of list prices.

b) *The relation between average revenue per minute and actual long-distance pricing*

Professor MacAvoy writes "No carrier charges ARPM as the price for any call; without a price, one cannot analyze the price-cost margin for the extent of market power utilized in a transaction, representative or otherwise." (*Affidavit*, p. 14). This is just plain wrong. LDDS, for example, offers a flat price per minute regardless of time of day and length of haul. This price is exactly its ARPM. LDDS's flat price of 12 cents per minute for high-volume dialup long distance customers gives it a razor-thin margin over its likely marginal