

termination (other than in special cases such as dedicated, high volume, point-to-point communication); (b) CAPs serve, and, due to the structure of costs, will probably continue to serve a narrow clientele (generally large users in high density metropolitan areas); (c) CAPs have succeeded in taking some market share from the LECs in narrowly delimited circumstances only at access rates that are artificially inflated by regulation; and (d) past CAP incursions into access services do not generalize to any service where a CAP would be dependent upon direct interconnection with a LEC. Assertions that CAPs will undermine the market power of the LECs in a range of services sufficiently broad to justify dismantling the MFJ, or that CAPs would be able to compete with the LECs absent the cross-subsidies built into regulated prices, are most certainly speculative, and not justified by the available evidence.

Woroch (pp. 4-5) provides updated information on CAP activity since the submission of his original affidavit, but this data demonstrates only the continuation of a trend, and not a quantum change. He also discusses the "headlong plunge by long distance carriers into local service markets" via CAPs (p. 7), but fails to mention that despite even the best efforts of these large, well-funded, and technically capable companies, the competitive impact of CAPs remains narrowly confined to market niches.

On pages 11-14 of his reply affidavit, Woroch discusses what he terms the "market share fallacy." He points out that CAP activity is growing, so that current market shares understate future market shares (p. 11), but he fails to mention that high growth on a tiny base does not amount to much in absolute terms.²¹ There is no indication that CAPs will acquire an appreciable share of access revenue within a time horizon that would be relevant to the issue of whether the line of business restrictions should be removed immediately, rather than at some point in the future when the limits of CAP growth are more than a matter of mere speculation.

²¹Indeed, as we noted (p. 47), and as Woroch does not dispute, the LECs are projected to retain more than 90% of access revenues through the end of the decade even under the most optimistic CAP expansion scenarios.

Woroch also argues that the CAPs' share of total access revenue (currently 1-2%) does not accurately measure market share (p. 12). He argues that CAPs collectively account for 10% of high capacity, dedicated access revenue, with market shares as high as 42% (in Manhattan).²² Astonishingly, Woroch does not seem to recognize that this proves our point: CAPs have enjoyed some measure of success only in narrow niche markets (primarily dedicated access for large business customers in high-density metropolitan areas), where direct dependence on interconnection with the local exchange is minimized (along with the associated vulnerabilities). More importantly, the CAPs' share of switched terminating access (i.e. terminating access for calls to arbitrary locations) is essentially nil. Dedicated point-to-point transmission aside, virtually all calls terminate through LEC networks -- CAPs have no meaningful economic presence in switched terminating access. This observation is of the utmost importance since, as demonstrated in section II.A, the RBOCs' ability to leverage substantial market power into long distance will remain as long as they have significant market power in switched terminating access. In fact, they have virtual monopolies over this network functionality.

Woroch also argues that conventionally measured CAP market shares are inaccurate, since it is more appropriate to measure shares based on capacity, rather than revenue. Yet the only evidence that he offers concerning capacity is the statement that "[c]urrently, CAPs purchase 6% of all fiber used in local markets for telephony and video applications" (p. 14, footnote 29). This figure is hardly reassuring, particularly given that it doesn't account for the enormous existing capacity of the RBOCs. According to figures presented in our first report (p. 57), in addition to 1.3 billion miles of copper cable, the LECs have deployed roughly 30 times as many miles of fiber cable as the CAPs.

We agree entirely with Woroch that capacity shares are important indicators of competitive significance. This is precisely why we noted, in the context of long distance services, that AT&T

²²He also claims that market shares are understated due to self-supply, but offers no reason to believe that this consideration is quantitatively significant.

currently controls only about 40% of long distance capacity -- far less than the revenue shares calculated by RBOC affiants Hausman and MacAvoy. It is refreshing for us to see an RBOC witness describe, in such clear and cogent terms, why Hausman and MacAvoy's analysis of the long distance market is completely misleading.

Woroch also argues that it is important to evaluate potential competition, as well as actual competition, from CAPs (p. 14). Yet he completely ignores our extensive discussion of entry barriers. CAPs are a competitive threat -- actual or potential -- only to a limited extent in narrowly circumscribed niche markets. Moreover, as we have explained repeatedly, the putative erosion of RBOC market power in these particular markets does not undermine the incentive or ability of RBOCs to leverage market power from other unaffected network functionalities, such as switched terminating access, into long distance.

Woroch attempts to dispute the narrowness of CAP activity, asserting that CAPs have branched out into "smaller" cities, with populations in the neighborhood of 200,000 (p. 16). He does not, however, indicate whether any CAP has achieved meaningful penetration in any of these areas. It is not surprising that many smaller cities would have limited, high-density, downtown areas that might attract CAPs, particularly at access charges that have been inflated by regulation. However, one must keep in mind the unrebutted fact cited in our first report (p. 46) that CAPs serve an average of only 85 buildings in cities where they operate. In addition, it is entirely possible that sunk costs are sufficiently large to deter the entry of more than one CAP, particularly in head-to-head competition for the same customers, even in medium-sized and large cities. Consequently, Woroch cannot rule out the possibility that CAPs will typically settle into stable duopolies with the LECs, leaving considerable market power intact.

The RBOCs also attempt to refute the narrowness of the CAPs' services by noting that "CAPs routinely undertake major network extensions to serve customers more than a quarter-mile from the CAPs'

existing fiber ring" (RBOC Reply, p.47). One would think that the need for a "major network extension" to serve a customer a quarter-mile from the CAP's ring would demonstrate the limitations on competition, but of course the RBOCs are applying a less demanding standard.

Woroch also argues that CAPs have begun to branch out into services besides dedicated access (p. 16).²³ He does not, however, provide any meaningful evidence concerning the competitive presence of CAPs in these areas, or even pretend to argue that the affected services (e.g. pay phones) are in any way relevant to the desirability of the MFJ's line of business restrictions.

Woroch argues that the LECs have responded to competitive pressure from CAPs by lowering rates for dedicated access (pp. 21-24). There are three flaws in this argument. First, even assuming that the access price declines were attributable to CAPs, this does not prove that CAPs have deprived the LECs of significant market power. Historically, regulators have artificially inflated access charges in an attempt to subsidize local service. A significant decline in access prices is therefore consistent with substantial residual market power. Second, Woroch's analysis of access prices is selective and misleading. His original affidavit focused exclusively on DS1 and DS3 services. Even with the addition of switched services, he has not provided a comprehensive picture of access charges. Reductions in the prices of particular access services do not imply that competitive pressures have reduced the general level of access prices. Indeed, the RBOCs' average special access rates currently range between 96% and 100% of the applicable price caps.²⁴ Thus, within the special access basket, rate reductions (relative to the price cap) for DS1 and DS3 must have been offset by relative rate increases for other services (such as Voice Grade and DDS). Third, Woroch has made no effort to quantify the fraction of the decline that is attributable to CAPs, nor to rule out other possible explanations (such as cost reduction measures resulting from the

²³Contrary to the RBOCs' claim (RBOC reply, p. 47), we have never said that the CAPs only provide unswitched access.

²⁴LEC Annual Access Filings, May 9, 1995, Tariff Review Plan, Chart IND-1, Line 520, Columns A and B (for each LEC respectively).

implementation of the FCC's price caps). In fact, Woroch's own statistics suggest that, for the most part, the decline in access prices has other causes. He concedes that CAPs have primarily focused on dedicated access, rather than switched access. Therefore, under his hypothesis that falling access rates reflected competition from CAPs, dedicated access rates should have declined substantially faster than switched access rates. Yet according to his table 3 (p. 24), this is not the case. Switched access rates actually declined more rapidly than dedicated access rates for two RBOCs (U.S. West and BellSouth). Averaging across the RBOCs, DS1 rates declined by 33.8%, DS3 by 32.8%, and switched access by 30.6% -- hardly a profound difference. Thus, most of the decline is probably due to factors other than CAP competition.

Woroch also argues that the RBOCs have responded to competition from the CAPs with greater investment and improved quality (pp. 24-28). In most cases, he makes no attempt to draw any empirical correlation between CAP activity and either investment or quality. For example, his figure 3 (p. 27) shows a steady rate of fiber deployment, rather than evidence of acceleration. A similar comment applies for labor costs (p. 32, figure 4). Likewise, virtually all his measures of quality simply held steady (p. 25).²⁵ In any case, a demonstration that the RBOCs have made *some* competitive response to CAPs would not establish that CAPs had significantly eroded RBOC market power. It is also noteworthy that, in the context of long distance, other RBOC witnesses (Hausman and MacAvoy) have explicitly rejected the validity of similar indices of competition.

(3) Cable. Spulber reiterates the by-now-familiar theme that some cable companies have plans to enter the local exchange business. He continues to miss the point, however, that the existence of these plans is not equivalent to the emergence of competition sufficient to render regulatory restrictions on LEC

²⁵Woroch asserts (pp. 25-26) that quality would have declined due to increased usage in the absence of CAP competition, but this is wild speculation. Woroch provides no evidence that quality was declining with increased usage before the advent of CAPs.

pricing obsolete. Nowhere does he or any other RBOC witness come even remotely close to arguing that the LECs would, if freed from rate regulation, refrain from raising their local rates significantly due to the alleged impending advent of competition from cable companies.

Unlike Spulber, we do not pretend to possess a crystal ball. It is easy to imagine many different fates for the cable industry. Indeed, according to the *Wall Street Journal* (7/24/95, p. 1),

"The Bells had feared that a cable-industry move into two-way networks... could threaten their monopoly on local telephone service. Cable companies likewise had fretted that the phone giants could use interactive networks to offer beefed-up local cable service. But it may well be awhile before either side makes good on those grandiose promises... 'Everybody's getting back to basics,' says Peter Price, president of Liberty Cable Television Inc. in New York."

Even if the local telephony ventures move forward, they may simply fail, due perhaps to unexpected costs, or difficulties in maintaining quality and gaining customer acceptance. The ventures may succeed, with the cable companies and the LECs settling into a cozy duopoly characterized by high market power. Cable companies may wind up in other markets, or in niche markets, such as interactive entertainment or video communications. We do not doubt that cable companies will compete with the LECs in some services, to some extent, at some point in the future. The relevant questions are: what services, to what extent, and at what point? It would be imprudent to dismantle the MFJ based on the promise of competition from cable companies until the answers to these questions are known.

Spulber also argues that "[t]he payments for access to cable technology and facilities by RBOCs indicates the market value of these enterprises" (p. 7). This statement is a tautology. Moreover, the size of the payments tells us nothing about the potential for local competition, since cable company assets have important uses and significant value entirely apart from providing local telephony, and since cable-LEC combinations may facilitate the creation of a variety of services aside from basic local telephony (e.g. video communication). Even if some unknown portion of the payments represents the prospective value of the capability to provide local telephony, this may well reflect future potentialities that are subject to considerable uncertainty, rather than current realities.

Spulber asserts that “[t]he technology of cable telephony is not speculative,” because most cable systems are capable of delivering telephone service today (p. 8). But this claim is a technical statement, and not an economic statement. It is astonishing to us that Spulber seems incapable of drawing this elementary distinction. The mere fact that cable telephony is technically possible does not mean that it will pass the market test in competition with existing wireline networks, rendering rate regulation obsolete

Finally, Spulber dismisses our concerns about customer acceptance of cable telephony on the grounds that “customers are indifferent as to the method of delivery of services” (p. 21). This is only correct if one holds price and perceived quality constant. Actual quality may differ for a variety of reasons, including the fact that cable systems are not built to the same standards of reliability as local telephone networks. Even if actual quality is the same, perceived quality may differ, e.g. if consumers have strong preconceptions, based on experience with cable TV, that cable service will be inferior or less reliable than traditional telephony. In these respects, the “method of delivery” may matter a great deal.

Woroch, like Spulber, confuses technical feasibility with economic viability. He claims that we “fail to see the possibilities of using existing cable television networks to provide traditional telephone services” (p.17). On the contrary, we see these possibilities quite well. But unlike Woroch, we see them as *possibilities*, and not realities. Similarly, Woroch emphasizes that “all cable networks in the U.S. built after 1970 were required to be designed to be two-way capable” (p. 17). Two-way capability is a necessary (but not sufficient) condition for technical feasibility; again, it does not establish economic viability.

Woroch also claims that “telephone service over cable networks is now being offered on a commercial basis in several places in the U.S.” (p. 18). Yet he cites only a single example of an existing service, which has been offered by an electric power utility (and not by a cable TV company) in the teeming metropolis of Glasgow, KY since 1991. Notably, he says nothing about the market penetration of this service, or about its effects on LEC pricing. Woroch’s only other example is Time Warner’s plan to

roll out a service in Rochester later this year. If the service is launched on schedule (which, based on the recent track record of cable companies, is a significant "if"), we and others will watch the results with considerable interest. We are astonished, however, that Woroch would presume to know the results of this experiment before it is performed, and that he would put the entire interexchange market at risk on the basis of his presumption.

Because of the virtual absence of experience with cable telephony in the U.S., discussions of commercial cable telephony in the U.K. take on particular significance. As noted in our original report (p. 51), the DOJ has concluded that the activities of cable companies are unlikely to diminish BT's market power during the next five years. In addition, we have explained that the U.K. experience exaggerates the probable competitive impact of cable telephony in the U.S., for three reasons.

First, the RBOC witness concede (e.g. Woroch's original affidavit, p. 30) that, when U.K. cable operators installed their facilities, they piggybacked a traditional copper twisted pair on a coaxial cable. Moreover, the twisted pair and the coaxial cable were connected to different fiber optic trunks. Thus, as we wrote in our first report (p. 51):

"[T]he U.K. precedent establishes that it may be cost-effective to deploy a second wireline telephone network if one can exploit economies of scope when installing television cable systems. It does not, however, prove that it is commercially feasible to provide telephony over the kinds of cable systems that currently exist in the U.S."

In response to this first point, Woroch argues that U.S. cable operators have natural cost advantages over their U.K. counterparts because the necessary cable infrastructure is already in place in the U.S., permitting U.S. firms to overlay two-way voice on an existing coaxial network (p. 20). This misses the point entirely. The question here is whether anything can be learned from the U.K. experience. Whatever this experience teaches us, it most certainly does *not* teach us anything about the economic viability of (a) installing and operating a second wireline network where the cable network already exists

(since this rules out economies of scope in installation),²⁶ or (b) overlaying two-way voice on an existing coaxial network (since U.K. cable companies did not use this technology). Woroch seems to insinuate that the second of these strategies would be more cost-effective than the U.K. strategy, but he offers no evidence to support this view. Moreover, even if the electronic overlay strategy proves less costly, commercial success depends upon quality as well as cost.²⁷ One big question mark for cable telephony is whether a level of quality acceptable to consumers can be achieved with a technology that has not been tested in large scale applications, using facilities built to lower standards of reliability than traditional telephone systems. Trials in the U.S. may shed light on this question, but experience in the U.K. does not.

Second, the U.K. experience exaggerates the likely competitive impact of cable telephony in the U.S. because U.K. cable systems were generally installed more recently than U.S. cable systems. As we wrote in our first report, "[c]ustomer resistance to cable telephony in the U.S. results in part from a fairly long and checkered history of experience with the quality of cable TV service. Cable telephony offerings in the U.K. did not generally have to contend with consumer preconceptions, or overcome reputational handicaps" (p. 51). Woroch merely reiterates that "until about 1987, the notion of cable television service was completely unknown to the U.K. population" (p. 19), evidently not comprehending that this corroborates our argument.

Third, in the U.K., BT had a reputation for unusually high prices and low quality, which has rendered it particularly vulnerable to competition from cable telephony. In our first report (pp. 51-52), we observed that Viacom's Chairman of the Board has attributed the success of cable telephony in the U.K. to the "terrible job" done by BT. Woroch inadvertently confirms this conclusion when he writes that "price was not a major determinant of cable telephony's success" in the U.K. (p. 19).

²⁶Thus, Woroch errs in suggesting (p. 20), based on the U.K. experience, that duplicate access lines are not as uneconomical as we contend.

²⁷Similar comments apply to Woroch's assertion that U.S. cable companies would pay lower interconnection charges.

Hausman claims (p. 25, footnote 59) that our arguments concerning the relevance of the British experience are disproved by Time Warner's plans to offer cable telephone service in the U.S. This is simple nonsense. Time Warner has not yet begun to offer this service, and it may or may not be successful. Our point is that, for a variety of reasons that Hausman simply chooses to ignore, the British experience tells us nothing about the prospects for Time Warner's success.

Finally, in our first report, we identified two additional reasons to believe that the effect of cable telephony on local competition will be limited (p. 52). First, cable companies will (in most locations) at most transform a local exchange service monopoly into a duopoly. There is no guarantee that such limited competition would be sufficient to eliminate the market power that gives rise to the MFJ concern. Second, many of the RBOCs are seeking to acquire or form partnerships with cable companies. As we have noted elsewhere, the RBOCs may well be inclined to exercise a large degree of mutual forbearance in each others' geographic markets, perhaps emphasizing video and entertainment services, rather than basic telephony. Both of these points are unrebutted.

(4) Wireless. According to Spulber, "[i]t would also seem impossible to deny that wireless cellular technology is a viable alternative to traditional wireline service" (p.8). As with cable, Spulber fails to distinguish between technical feasibility and economic viability. A household could certainly cancel its wireline subscription and substitute a cellular phone for home use, but this would greatly increase monthly bills and reduce quality. Hence, reliance on the wireline network for home usage remains essentially universal. Spulber does not refute our contention that cellular service is not currently cost-competitive with wireline service for non-mobile uses.

Spulber is correct in saying (p. 9) that the past growth in the cellular business is not speculative, but this growth reflects the use of cellular technologies in mobile applications, as complements to, rather than substitutes for, the wireline network. The ultimate extent of competition between wireless and wireline networks unquestionably remains the subject of speculation. Spulber also faithfully reports that

AT&T and others have paid tidy sums for cellular properties, but, as in the case of cable, this proves nothing about the likely extent of local competition.

Spulber also asserts that “[a]lthough it continues to evolve rapidly, the technology for providing digital personal communications services... is far from speculative” (p. 9). Again he confuses a statement about technology with a proposition about economic viability. Nothing in the record proves that PCS will allow companies to offer wireline-quality service at a competitive price, and in this instance Spulber even concedes that the technology has not yet arrived. He cites projections concerning the growth of PCS, but admits that these numbers are “predictions” (p. 9). Moreover, neither the growth forecasts, nor Spulber’s data on the value of PCS licenses, proves that PCS will become an important substitute for, rather than the leading mobile complement to, the wireline network.

Conclusion #19: Analyses of stock market reactions to “events” that allegedly indicate the intensification of local exchange competition do not establish the absence of significant market power, or even the meaningful erosion of market power.

Two affidavits accompanying the RBOCs’ original submission (one by Lehn, the other by McCormick) attempted to document the importance of emerging competition by measuring the loss in value to the RBOCs resulting from a variety of allegedly competitive moves into the local exchange by non-LECs, through the use of “event studies.” Our first report demonstrated that the Lehn and McCormick studies are fatally flawed, both in conceptualization and implementation. Lehn’s response affidavit contains comments on some of these criticisms (McCormick has not submitted a reply affidavit). We will review here each of the criticisms set forth in our original report, and evaluate Lehn’s responses.

(1) “[T]he quantification of competitive impact, even if accurate, is virtually meaningless in the context of the RBOCs’ current motion” (p. 67). We argued that this conclusion is justified for two separate reasons. First, “[e]vents that affect profits even in the relatively distant future can significantly affect the value of the RBOCs today” (p. 67). We provided a simple numerical example to show that the decline in value measured by Lehn could be explained by events that have no effect on market power for

the next decade. Second, we noted that, even if the analysis is correct (which it is not), the RBOCs may still retain as much as 75% of the market power of a monopolist (p. 68). Since the logic of the MFJ depends only on the presence of significant market power constrained by regulation, and not on the absence of monopoly, Lehn's findings are of little or no relevance.

Lehn ignores the second point entirely. Moreover, his "response" to the first point is a simple concession: "Unfortunately, there is no reliable way to infer the expected time path of future competition from the stock price declines" (p.8). He then attempts to distract attention from this concession with two non-sequiturs. First, he quotes a number of analysts who suggest that the RBOCs increasingly face competition (pp. 9-10). Yet none of these quotes relate to the effects of the specific events in question, none suggest any measure of the degree of erosion of market power, and, most importantly in this context, none provide anything resembling a time table for the intensification of local competition. Second, he asserts that evidence of competitive activity has been presented by other RBOC affiants (pp. 10-11). That, however, is not the issue. We have discussed other evidence of local competition above. The question here is whether the event studies contribute anything of independent significance to the debate on local competition. By defending his study in this way, Lehn effectively concedes that its incremental contribution is non-existent.

The event studies must therefore be dismissed on the grounds that this first point is unrebutted. However, since we do not wish to leave the impression that the studies are otherwise sound, we will also review the other criticisms set forth in our first report.

(2) "[O]f the eight events considered by Lehn, only three produced market reactions that are statistically significant at conventional levels (95% or greater)," and, in particular, neither extended CAP interconnection, nor the announcement of the Time-Warner Florida network had a significant impact on RBOC market values (p. 68).

As we will discuss below in greater detail, this criticism must be evaluated in the context of our other criticisms. In particular, it is important to keep in mind which events show up with statistically significant effects, and which do not. This following table summarizes this information, as measured by Lehn.

Table 1: The Statistical Significance of the Lehn Events

Level of statistical significance	Events
99%	MCI local network initiative, 1/94
95%	AT&T-McCaw, 11/92 PCS spectrum allocation, 9/93
90%	MCI wireless consortium, 10/92 FCC vote on CAP interconnection, 9/92
Not significant	Time Warner Florida network, 1/93 FCC vote on CAP interconnection, 10/93 AT&T-McCaw, 9/93

As we demonstrated in our original report and reiterate below, the four wireless events must be excluded from consideration (see criticism (3)). This eliminates both of the events that are significant at the 95% level, and one of the events that is significant at the 90% level. We also demonstrated in our original report, and reiterate below in criticism (4), that Lehn's analysis of the MCI local network initiative event is severely flawed. When the data concerning this event are properly interpreted, there is no reason to believe that the RBOCs were adversely affected by MCI's announcement. This leaves only three events, two of which are labeled "not significant" in Lehn's original report, and the last of which is only marginally significant. Moreover, for the marginally significant event, Lehn measures an impact on the RBOCs of \$4.4 billion -- a far cry from his original estimate of \$33 billion.

Lehn responds that, in some cases, the lack of statistical significance may reflect the leakage of information prior to an announcement (p. 11). But Lehn cannot infer the existence of informational leakages from the absence of statistical significance. Moreover, Lehn explicitly considered the possibility

of informational leakages in his original report (pp. 2-3). In the case of FCC decisions, he compensated for leakages by "us[ing] an event window ... that extends from the date of the FCC's public notice of the relevant Commission meeting until one day after that meeting" (p. 3). Despite the possible existence of leakages, Lehn represented his eight events as situations in which he believed, on the basis of his professional expertise and reading of the financial and trade press, that new information was definitely released over the course of some "appropriately" chosen event window. Lehn's original position never precluded the possibility that some related information might have been released to the market on a previous date -- rather, his first report simply maintained that the eight events corresponded to the release of some new and important information. Lehn's new position therefore amounts to a repudiation of his original report -- he himself now calls into question his own professional judgment in identifying appropriate events and associated windows.

In addition, Lehn does not appear to recognize that, in raising the issue of informational leakages, he lends greater credence to the view that his results may be attributable to the effects of confounding events (see criticism (3), below). In identifying confounding events, we have confined our attention to Lehn's event windows. However, if it is possible to have informational leakages for the events of interest, then it is also possible to have leakages for confounding events. This suggests that Lehn's results may be contaminated by a much broader range of events than those identified in our original report. Simply put, the validity of the event study methodology depends upon the analyst's ability to identify the timing of relevant events with reasonable precision -- something which Lehn now admits he is incapable of doing.

Lehn attempts to resuscitate his analysis through a reexamination of each event that lacked statistical significance (pp. 11-15). With respect to expanded interconnection, he now identifies an additional event that somehow escaped his notice when he was preparing his original report. Similarly, he identifies a variety of new events for the PCS spectrum allocation decision. He then argues that the effects

of these events (as well as the AT&T-McCaw events) should be combined to assess an "aggregate" impact. In the case of the Time Warner venture, he redefines his event window.

One cannot read this portion of Lehn's affidavit without anticipating criticism (5) below, concerning the apparent absence of scientific standards. This is nothing more than a transparent exercise in data-mining. Lehn is bound and determined to uncover statistically significant effects, even if this means conducting a fishing expedition for new events, and implicitly repudiating his original events and event windows, along with the process by which these were selected.

Lehn's practice of combining events is particularly suspect. This opens the door wide to data mining, since it permits one to conclude that a collection of events are significant merely because one member of the collection was significant (as in the case of Lehn's analysis of the McCaw events). It also permits the analyst to pre-select a collection of events based on the direction of the share price movement, none of which may be significant in isolation, but which, when combined, may appear to yield a statistically significant effect.²⁸

The extent to which Lehn allows his prior beliefs to affect his analysis and interpretation of data is perhaps nowhere more evident than in his discussion of the PCS spectrum event. Ultimately, he is forced to conclude that the collection of related events is not statistically significant by conventional standards (p. 15). Rather than allow his priors to be disturbed by the results of his study, he dismisses this finding by asserting that certain PCS spectrum events are "somewhat ambiguous" (p. 15). If this is his opinion, one wonders why he identified the 9/93 event in the first place. Lehn's concluding remark concerning the PCS events is also particularly telling: "a detailed analysis of each announcement, as well as other developments in PCS, is beyond the scope of this affidavit" (p. 15). Evidently, Lehn is considerably less enthusiastic about pursuing leads that might undermine his conclusions.

²⁸The appearance is, of course, illusory, because the traditional tests of statistical significance do not adjust for preselection of the events based on the direction of the observed effect.

(3) "Lehn has plainly misinterpreted a number of the events, as well as share price movements within the 'event windows'" (p. 68). In particular, with respect to each of the wireless events, Lehn's original report presented no evidence that these events had any immediate or near-term impact on the value of the local exchange franchises, rather than on affiliated cellular enterprises.

Lehn responds in two ways. First, he cites various articles from the business press at the time of the announcements which suggest that wireless services may, at some point, become competitive with local wireline services. While the possibility of reuniting long distance with *any* form of local service clearly titillated reporters, none of the news reports contained anything beyond the kinds of vague speculations about future competition from wireless that were also common prior to these events. Certainly, no hard information concerning a time table for local competition emerged from the AT&T-McCaw merger. With respect to the MCI wireless initiative, Lehn neglects to mention that, according to the business press, MCI president and CEO Daniel Akerson "held out the possibility that *by the end of the decade*, a wireless system could replace ordinary telephone services" (emphasis added).²⁹ Allowing for the usual hyperbole accompanying the announcement of any new initiative, it is highly doubtful that savvy investors regarded the MCI announcement or Akerson's comments as harbingers of near-term local competition. Likewise, Lehn neglects to mention that the business press also emphasized the immediate impact of the AT&T-McCaw merger on competition in the cellular industry. For example, the Wall Street Journal and Dow Jones News Wire quoted one analyst on 11/4/92 as saying that "[b]esides money to refinance itself, McCaw gets marketing muscle and expertise." The Wall Street Journal also reported on 11/6/92 that "McCaw will *instantly* make AT&T the wireless service industry's biggest player, with the ability to reach out and touch more than two million cellular customers in most major U.S. markets" (emphasis added).

Second, Lehn argues that "[i]f the Hall/Bernheim/Willig interpretation -- that the observed decline in RBOC stock prices was driven by effects on their cellular operations -- is accurate, we would expect the

²⁹Wall Street Journal and Dow Jones News Wire, 11/9/92.

stock price responses of the RBOCs to be similar to those of independent cellular companies.” (P. 6) He finds on the contrary that the share prices of the independent cellular companies increased at the time of the AT&T-McCaw announcement, and concludes that the declines in share price for the RBOCs could not have been explained by a decline in the value of cellular franchises.

This is simple nonsense. As we explained in our original report, the AT&T-McCaw deal raised the value of the independent cellular companies because it indicated that they were natural takeover targets. Contrary to Lehn’s claim (p. 7), this is not a mere theoretical “postulate.” According to the Dow Jones News Wire on 11/4/92, the AT&T-McCaw announcement “lit a fire beneath cellular stocks earlier today. Market players say the cellular group moves whenever takeover talk swirls about any member.” Likewise, on 11/5/92, the Wall Street Journal and Dow Jones News Wire referred to the AT&T-McCaw deal as the “precursor to further consolidation” within the ranks of independent cellular operators, and it quoted one analyst as follows: “immediately on AT&T’s heels, the long-distance companies are going to have to increase their presence, something that will put a big scarcity premium on the remaining independent properties.” Lehn evidently recognizes this point, but asserts that he would “still expect the RBOCs to benefit from an industrywide increase in cellular asset values” (p. 8). The logic of this assertion is difficult to understand. By strengthening McCaw, the merger reduced the value of McCaw’s cellular competitors (primarily the LEC cellular affiliates). By increasing the probability that other independent cellular operations would become takeover targets, it also raised their values; moreover, the associated increase in the likelihood that other acquisitions would strengthen other LEC cellular competitors would have further reduced the values of the LEC cellular affiliates. It is highly unlikely that the AT&T-McCaw merger increased the perceived likelihood that the RBOCs’ cellular affiliates would become takeover targets, and hence there was almost certainly no offsetting increase in their values. It is noteworthy in this regard that the business press (quoted above) specifically referred to *independent* cellular operations as the likely takeover targets and indirect beneficiaries of the AT&T-McCaw merger.

Similar comments apply with respect to the MCI wireless initiative. For the PCS spectrum event, Lehn actually finds that the values of the independent cellular companies declined, but that these declines were not as large as those experienced by the RBOCs.³⁰ At most, this difference indicates only that, in Lehn's words, "investors believed these developments had very different valuation implications for the RBOCs than for these independent cellular companies" (p. 8); it does not establish why the perceived valuation implications differed. One possibility is that the negative effects of PCS for independent cellular providers might have been offset to some extent by the perception that PCS would make it easier for the independent cellular companies to become part of larger wireless networks.

In our first report, we also argued that Lehn's events are contaminated by other developments that affected the share prices of the RBOCs within the relevant event windows. In response, Lehn argues that these "are simply examples of the normal daily information flows that exist for large public corporations such as the RBOCs" (p. 16). He claims that since he analyzes "a portfolio of all seven RBOCs and use[s] widely recognized statistical procedures to distinguish significant price changes from the 'noise' induced by normal market information flows, unrelated announcements like those identified by Bernheim and Willig should not affect [his] conclusions."

This response reflects an abuse of methodology. When an event study concerns a large number of similar events (and, of course, when the events have not been preselected based on other information), one can often invoke the principle that the "noise" arising from unrelated events averages out, and does not systematically affect the results. However, when one is studying a small number of isolated, idiosyncratic events (as is Lehn), this is no longer a safe assumption. "Noise" does not average out over a single observation. Indeed, when one examines a single event, the decision to focus attention on one development, and to label another development as "noise," is inherently arbitrary. One could, with equal justification (or lack thereof), conduct a study of the July 1993 event window with the object of measuring

³⁰He does not, however, indicate whether the difference is statistically significant.

the impact of Motorola's Iridium project, treating the CAP interconnection order as the kind of normal "noise" experienced by large companies such as the RBOCs.

Lehn also argues that three of the eight confounding events identified in our first report concern particular RBOCs, and that his results remain valid even when one omits the contaminated data on these RBOCs. Yet his own analysis demonstrates that PacTel's losses during the August 1993 event window were larger than those of the other RBOCs; the fact that the other RBOCs also experienced negative returns may be attributable to the other confounding events that we have identified for the same period. It is also notable that, in focusing on these three events, Lehn has ignored entirely the other five confounding events identified in our first report.

(4) Lehn's interpretation of the January 1994 MCI event is fundamentally flawed. As noted in our original report (as well as in the affidavit of McCormick), the RBOCs recovered essentially all of their lost value by the end of January, indicating that the market had probably overreacted, and then self-corrected over a period of several weeks while investors assimilated more accurately the implications of the news.

Lehn responds to this argument in two ways. First, he speculates that the recovery in RBOC share prices may have been due either to "further developments on pending telecommunications legislation and strong fourth quarter earnings announcements for several of the RBOCs" (p. 23). Yet in our original report, we noted (p. 71 n.63) that

"[t]he Administration's desire to pass a bill that would 'free up competition' was well known prior to this period, and it reaffirmed its commitment to this objective in early January. The Congressional hearings for late January were already anticipated during the Lehn/McCormick event window."

Lehn has simply ignored this passage. As for fourth quarter earnings announcements, Lehn errs by considering the absolute size of these announcements, rather than the earnings "surprise" (i.e. the difference between expectations and realizations). Lehn is clearly cognizant of the need to make this distinction, since he writes (p. 11) that "stock price changes reflect only the unanticipated component of an

announcement." Yet Table 2 demonstrates that, for five of the seven RBOCs, fourth quarter earnings were *lower* than expected. The recovery in the value of the RBOCs was therefore all the more dramatic, in that it overcame disappointing earnings information.

Table 2: Fourth Quarter 1994 RBOC Earnings Surprises

RBOC	Value Line EPS Forecast, 1/14/94	Actual EPS	Difference
Ameritech	0.65	0.72	+0.07
Bell Atlantic	0.83	0.77	-0.06
BellSouth	0.91	0.99	+0.08
NYNEX	0.85	0.74	-0.11
Pacific Telesis	0.73	0.66	-0.07
SW Bell	0.65	0.64	-0.01
US West	0.74	0.62	-0.12

Thus, neither we nor the RBOCs' affiants have been able to identify any other events that could plausibly have accounted for the dramatic recovery in RBOC share prices during January 1994. It is also noteworthy that the pattern of share price movements depicted in McCormick's affidavit indicates a gradual decline during the event window, followed by a gradual recovery. This is more consistent with the kind of pattern that one would expect to observe following the announcement of a complex event that requires careful study, than with the kind of sudden price movements that generally follow discrete, familiar events such as earnings announcements.

Lehn also attempts to "test" our hypothesis about the January RBOC share price recovery by examining whether the RBOCs with the largest negative reactions in the event window had the largest recoveries in late January (p. 23). He claims that his regression results (Table 5) do not support our conclusions, but this is simply incorrect. The point estimate for the coefficient of early January returns (in

a equation explaining late January returns) is negative, indicating that the RBOCs with the largest share price declines did tend to have the largest recoveries (at the rate of 24 cents on the dollar). Lehn emphasizes that the estimated coefficient is not significantly different from zero in the statistical sense, and claims that this is inconsistent with our analysis. This is obviously wrong, since the 95% confidence interval also includes a value of -1, which indicates dollar-for-dollar recovery. The absence of statistical significance is understandable, given the small size of the sample (seven observations).³¹ More importantly, Lehn has ignored the fact that the share prices of each RBOC moved during the event window for reasons other than the MCI announcement. Thus, his independent variable -- which is supposed to measure the effect of the MCI event on the share price of each RBOC -- contains significant measurement error, and its coefficient is biased towards zero.³² One simple method of reducing the bias induced by measurement error is to order the observations according to the size of the independent variable, drop the "middle" of the sample (in this case, we drop a single observation -- Bell South), divide the remaining sample into two groups based on whether the independent is high or low, and compare average values of the dependent and independent variables across the two groups.³³ We exhibit the results of these calculations in Table 3. Note that the estimated rate of share price recovery during the second part of January (which still remains biased toward zero, but to a lesser extent) rises to 68 cents for each dollar lost in the event window, compared to 24 cents for the OLS estimate. This finding is certainly consistent with our hypothesis.

³¹Indeed, in referring to a study based on 31 observations, far more than in the current instance, RBOC affiant Ying states that "[s]uch a small number of observations relative to the number of estimated parameters invariably leads to imprecise, unreliable results..." (p. 4).

³²Henri Theil, *Principles of Econometrics*, John Wiley & Sons, Inc.: New York, 1971, pp. 608-609.

³³Formally, this is usually accomplished by instrumenting the independent variable with dummy variables indicating the range of the independent variable. See A. Wald, "The Fitting of Straight Lines if Both Variables are Subject to Error," *Annals of Mathematical Statistics*, 1940, pp. 284-300, or, for an application, M. Feldstein, "Social Security Benefits and the Accumulation of Pre-retirement Wealth," in F. Modigliani and R. Hemming (eds.), *The Determinants of National Saving and Wealth*, New York: St. Martin's Press, 1983, pp. 3-23.

Table 3: A Reexamination of the RBOC Share Price Recovery Hypothesis
for January, 1994

Group	Average loss, early January	Average gain, late January
Large losses, early January	-8.95%	4.26%
Small losses, early January	-4.91%	1.53%
Difference	-4.04%	2.73%
Ratio of differences	-0.68	

We also noted in our original report that the January 1994 MCI event is particularly important, because it accounts for "most of the mileage in Lehn's analysis" (p. 70). Specifically, "if one disregards the wireless events, and drops the events that lack statistical significance, this is essentially all that is left." Lehn responds that the event in question accounts for only about \$11 billion of the total \$33 billion decline in RBOC value identified in his study (p. 22). This is an obvious non-sequitur, since the \$33 billion decline improperly includes the wireless events, and also adds in measured effects that are statistically insignificant. The importance of this event for Lehn's analysis is therefore unrebutted and undeniable.

(5) Lehn's analysis is "fundamentally unscientific" (p. 71). We noted that Lehn did not study all of the relevant events; nor did he provide any description of, or justification for, the method by which he selected this particular subset of events.

Lehn responds that his goal was to "identify a set of events that were widely reported and recognized and had unambiguous implications for the RBOCs" (p. 20). This hardly qualifies as a rigorously scientific selection criterion. How "widely reported" did an event have to be to receive consideration for inclusion in the study? How was the "width" of reporting measured? What sort of "recognition" was required? How did Lehn determine whether any particular event had "unambiguous implications"? In light of the data mining evident in his reply affidavit, as well as his tendency to dismiss results that do not coincide with his priors, one suspects that Lehn's measure of "ambiguity" may have had

more to do with the direction of observed share price movements than with the information content of these events. Moreover, given that the absence of ambiguity has now been set forth as a selection criterion, and given that the wireless events have been shown, at a minimum, to be highly ambiguous, is Lehn not compelled by his stated selection criteria to drop the wireless events from his study?

Lehn also asserts (p. 20) that

“even if we accept Bernheim and Willig’s claim that we omitted many events that ‘heralded the onset of greater local exchange competition,’ this likely implies that we have understated the full decline in RBOC values. Only if there were more omitted announcements signaling *reductions* in, as opposed to *increases* in, expected future competition would the inclusion of the additional announcements reduce our measured decline in equity values.”

This response misses the point entirely. The issue here concerns sample selection bias. On average, out of every 100 inconsequential events, one will observe share price movements of any given sign that are statistically significant at the 90% level of confidence in five cases. Thus, the existence of five cases with statistically significant negative share price movements proves nothing unless one knows the universe from which the events were selected, and the details of the selection criterion.

Lehn attempts to justify his arbitrary selection criterion after the fact by conducting, for his reply affidavit, a search of the *Wall Street Journal Index* (p. 21). The fact that he evidently did not conduct this search prior to writing his original affidavit is telling. While he admits that “there were other developments that had implications for local competition,” he concludes that “they were not appropriate for inclusion in our analysis.” Yet his reasons sound more like *ex post* rationalizations than like scientific selection criteria. One has only to read the affidavits of other RBOC witnesses, such as Woroch, to obtain lists of local-competition-enhancing events with allegedly unambiguous implications.

(6) In our first report, we argued that “it would be unwise to subordinate a retrospective and comprehensive evaluation of competitive conditions by professional economists to the instantaneous reactions of Wall Street analysts” (p. 72). Lehn concedes the point (p. 24), but argues that an analysis of valuation effects can shed additional light on the issue. In particular, he asserts that “[e]vent studies are

one of the most widely used and accepted empirical techniques of modern financial economics" (p. 24).

While the event study technique is unquestionably useful when applied in appropriate contexts, this does not justify its indiscriminate use in all contexts. Financial economists generally recognize that event studies provide information on market perceptions. This is particularly useful when the focus of the inquiry is on market perceptions, e.g. whether the market interprets dividend announcements as indicative of profitability. However, to assert that the instantaneous perceptions of the market accurately measure economic fundamentals -- an assumption implicit in Lehn's analysis -- is another matter entirely.

IV. THE EXTENT TO WHICH REGULATION MITIGATES THE DECREE'S CONCERNS

A. REGULATIONS DESIGNED TO PREVENT THE RBOCS FROM LEVERAGING MARKET POWER

Conclusion #20: Absent the MFJ, there would be plentiful opportunities to circumvent regulation by disguising discriminatory activities as colorably legitimate business practices.

As we explained in our first report (p. 74), assertions that equal access and non-discrimination requirements suffice to prevent the RBOCs from leveraging their market power into adjacent markets are predicated on the unstated but critical assumption that anticompetitive practices are always easy to detect. The most likely forms of anticompetitive conduct are those that can be cloaked in colorably legitimate business practices. Time-honored favorites include claims of technical limitations, contrived cost justifications, and assertions that certain discriminatory practices are legitimate responses to competitive pressures. An RBOC need not even degrade existing connections and services for competitors; it need only obstruct competitors' abilities to enhance quality and service as needed to compete effectively with the RBOC's improved offerings.

We also explained in our original report (p. 75) that there is a fundamental inconsistency at the core of the case to dismantle the MFJ, related to the implications of vertical integration. Throughout their

affidavits, the RBOCs' witnesses emphasize that technological advances have greatly enhanced the value of integrated service offerings. Moreover, they claim that true vertical integration is necessary to achieve these benefits. But the integration that they envision would blend activities and facilities, thereby creating unprecedented opportunities for discriminatory abuses -- as well as colorably legitimate rationalizations for these abuses -- that do not exist with today's unintegrated networks. Neither the RBOCs nor their affiants have made any effort in their latest submissions to resolve, or even to address, this striking inconsistency.

We further illustrated this inconsistency by citing (p. 76) one RBOC affiant's vision of the post-MFJ world. According to Alchian (p. 8), absent the MFJ, there would be no clear long distance gateways -- "long-distance and local service facilities would become integrated throughout the system." It is difficult to imagine how one would even begin to think about equal access in such a world. Alchian himself evidently despairs of meaningful equal access, projecting instead competition among vertically integrated firms.

Thus, the RBOC witnesses have already written the text for future RBOC defenses of discriminatory practices. Many of these practices would be cloaked in the purported advantages of vertical integration, with the RBOCs maintaining that they cannot, as a matter of cost or technical feasibility, create the same service opportunities for unaffiliated firms. Such claims would be entirely consistent with their stated reasons for seeking an end to the MFJ in the first place.

We argued in our first report that likely methods of discrimination include discriminatory pricing (pp. 76-77), the implementation of technological changes to improve service quality exclusively for their own integrated services (p. 77), and the bundling of services (p. 79). We offered examples of past abuses and, in each case, we pointed out that several RBOC witnesses (particularly Hausman and Fisher) have, in other proceedings, conceded not only the viability of abuse through these kinds of discriminatory practices, but also the inclination and ability to cloak the defense of these abuses in the language of legitimate business practices. It is difficult to understand why the RBOCs' witnesses would believe that regulators