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Financial Effects of Broadband Regulation

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This paper addresses several public policies with direct or indirect implications for financing broadband deployment: (1) TELRIC pricing, (2) cable open access, (3) structural separation of local exchange carriers, (4) the Tauzin-Dingell bill, (5) telecom mergers, and (6) Section 271 approvals. Additionally, it provides evidence from capital markets on three of these: open access, Tauzin-Dingell and Section 271 approvals. Setbacks for cable open access appear to have increased Internet share prices. Tauzin-Dingell has had no visible effect on the stock prices of competitive local exchange carriers. Section 271 approvals were accompanied by abnormally negative returns for WorldCom and Sprint shares, while Section 271 denials were accompanied by abnormally positive returns for these issues and with declines in some Internet stocks, notably Sun, Level 3 and Cisco. We conclude that investors generally anticipate that structural restrictions on telecommunications providers, including unbundling of advanced services, will inhibit broadband deployment.

I. The Pace of Broadband Deployment¹

Why isn't broadband ubiquitous? Potential benefits appear enormous, yet just ten percent of U.S. households subscribed to cable modem service, digital subscriber lines (DSL), or other high-speed access technologies at year-end 2001.² Widespread broadband deployment could facilitate telecommuting, video-on-demand, video-conferencing, interactive gaming and popular applications yet to be invented. A recent paper by Robert Crandall and Charles Jackson (2001) estimates the potential net benefit of broad diffusion of broadband in the U.S. at roughly \$300 billion per year, or more than \$1,000 per person.

The recent pace of broadband deployment has been the focus of a highly-charged policy debate. Section 706 of the 1996 Telecommunications Act directs the Federal Communications Commission to take remedial action where advanced services are fail to be deployed in a "reasonable and timely fashion."³ Interests have supported or opposed alternative positions on the "reasonable and timely" deployment question in accordance with their demand for FCC intervention.

A violent interruption of financial markets' enthusiasm for broadband investments in 1998-1999 produced sharp equity price declines (and worse) for dozens of broadband service and technology providers during 2000-2001. Among the well-publicized bankruptcies are Northpoint Communications, Rhythms, and Covad, the three leading wholesaler providers of DSL networks in the United States, and Excite@Home, the leading broadband access provider. @Home invested over \$9 billion in high-speed networks, and served 4.1 million subscribers when it dissolved in late 2001.

In vulgar terms, the relevant policy question now is whether there is too much regulation or too little. One view sees incumbent service providers – notably, the legacy monopolies in cable TV distribution and local telephone exchange access -- as continuing their dominance, thwarting new entry by upstarts into broadband. Under this view, only when the "last mile" bottleneck maintained by these firms is opened up via regulations allowing new rivals to share the existing infrastructure will competition gain a toehold. The analysis can be similarly applied to either sector,

¹ Broadband is the generic title for high-speed access to the Internet, referring to connections capable of at least 200 kbps both upstream and downstream. Since many residential customers subscribe to high-speed services which are slower than 200 kbps in the return path (where data demands by such users are usually less), this paper makes no distinction between "broadband" and "high-speed" (one-way broadband) connections.

² A November 2001 Yankee Group study found 10.7 million household broadband subscribers. There were about 105.4 million U.S. television households in December 2001, and TV households cover about 98% of the household universe. Alorie Gilbert, *Report: Broadband Home Use Jumps*, CNET News.com (Dec. 11, 2001), <http://news.cnet.com/news/0-1004-202-8146643.html?tag=pff> (visited Jan. 14, 2002); "Industry Statistics," National Cable Television Association website, http://www.ncta.com/industry_overview/indStat.cfm?ind OverviewID=2 (visited Jan. 14, 2002).

³ See: Federal Communications Commission, *In the Matter of Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996*, CC Docket No. 98-146 (1998).

even as regulatory regimes currently differ quite dramatically; cable companies have largely escaped “open access” rules mandating that they share their high-speed Internet access networks with independent Internet Service Providers (ISPs), while local telephone companies are under extensive requirements to offer total resale, or unbundled network elements, to competitors at regulated wholesale rates. The too-little regulation view sees cable companies as unfairly escaping regulation, and the local telcos (and particularly, the Regional Bell Operating Companies, or RBOCs) as thwarting access by gaming the regulatory system. Some have suggested the death penalty -- structural separation of wholesale and retail components of local telephone service offered by incumbent carriers. Advocates of this “insufficient regulation” argument include the long-distance carriers (IXCs) and competitive local exchange carriers (CLECs).

Others posit that the sector suffers from excessive regulation, including widespread uncertainty over what rules may be imposed. They assert that cable, telco, satellite and fixed wireless providers of broadband have curtailed investments in infrastructure and technology due to regulatory risk. As a result, investments in content and applications have lagged, reducing consumer demand, and further inhibiting investment in networks.

Cable television operators seek to avoid common carrier obligations, designing systems (and allocating coaxial cable bandwidth) so as to limit possible appropriation by regulators or rivals. Incumbent local exchange company (ILEC) networks are subject to regulatory obligations imposed by a 1996 Telecommunications Act that did not fully anticipate the issues raised by broadband. The statute subjects legacy voice systems to sharing requirements, evincing legislators’ views that traditional phone networks enjoy some substantial element of natural monopoly. Yet, DSL functionality is something that must be constructed with significant new investment, and is a service offered against a rival with market dominance (cable broadband). Imposing sharing obligations on a new, non-dominant service lowers investment incentives without capping market power (indeed, it exacerbates it). Calls for local exchange company (LEC) structural separation simply intensify the threat of appropriating fixed capital.

This paper tackles a basic question: Is broadband regulated too much or too little?

Whatever the answer, it seems clear that the policy struggle has itself been sufficiently fierce to deter investment. The *New York Times* calls the regulatory debate pitting the RBOCs against AT&T (the leading IXC), “one of the most bitter lobbying campaigns of the last decade.”⁴ Bear Stearns analyst Douglas Ashton offers the inevitable conclusion: “Regulatory uncertainty is getting to be a problem. It’s hard to invest money. This has got to stop.”⁵

⁴ Lizette Alvarez, In Capitol, AT&T and Bells Fight to Control Web Access, *New York Times*, August 29, 2001, p. C1.

⁵ Policy Seers Say Phone Future Has Smaller Role, Broadband Duopoly, No AT&T or CLECs, State Telephone Regulation Report, August 3, 2001.

II. Empirical Literature on the Effects of Telecom Regulation

DSL service is subject to extensive regulations including both wholesale and retail price controls. Cable has been largely deregulated, yet the threat of re-regulation is ever present. An organized campaign to impose “open access” requirements (analogous to wholesale price controls) on cable operators offering high-speed Internet access has brought the issue to local franchising authorities and the FCC.⁶ Fixed wireless and satellite services could potentially be subject to restrictions. Has regulation, or the threat of regulation, affected innovation and investment in broadband?

Common Carrier Status. An extensive literature examines the effects of privatization on the telecom sector, with important implications for regulation. Borolotti et al. (2001) examines the effects of both privatization and regulation across 31 national telecom companies in 25 countries. The implementation of “third-party access” – essentially, common carrier status – was found to be associated with strong negative effects on investment. Forced third-party access did not result in lower profits or significant changes in output. This set of results (decreased investment and no increase in output) has relevance for broadband “open access,” discussed below, which would turn cable systems partly into common carriers.⁷

Rate of Return Regulation. Several papers have found that incentive regulation – price caps as opposed to rate of return regulation – hastens the introduction of new technology. See Taylor, Zarkadas and Zona (1992), Greenstein, McMaster and Spiller (1995), and Ai and Sappington (2001). The latter paper also found lower costs under incentive regulation. It did not find systematic differences in revenues, profits, investment or penetration rates. Still, the evidence taken as a whole argues against the efficiency of cost-based price regulation.

Similarly, Prieger (March 2001) studied the effect of “Opportunity Indiana,” under which the state lifted traditional rate-of-return regulation on incumbent RBOC Ameritech, substituting a combination of price caps and free market pricing. Prieger finds a dramatic increase in the creation of new telecommunications services, though he cannot rule out a “demonstration effect” – Ameritech rolling out products to encourage favorable regulation rather than a response to local profit incentives.

These results are relevant to broadband because rate-of-return regulation bears a strong resemblance to so-called TELRIC (total element long-run incremental cost) regulation promulgated by the FCC under the 1996 Telecom Act.⁸ Various ILEC components, including those used to supply DSL service, fall under the TELRIC regime. Rate-of-return regulation sets retail prices based on historical investment and actual costs. TELRIC regulation attempts to set wholesale prices based on estimates of current costs with state-of-the-art technology, which are typically lower than

⁶ A current FCC rule making is considering the imposition of such requirements.

⁷ Paradoxically, third-party access was associated with higher levels of employment in Borolotti et al. (2001). This may represent a shift away from capital investment toward labor when common carrier status carries the potential of appropriating returns to capital.

⁸ See Kahn (2001).

historical costs. Thus it represents the same principle of regulating prices to constrain network returns, and theoretically imposes harsher limits (i.e., lower prices).

Regulatory Delay. Hausman (1997) looks at the influence of regulatory delay on the introduction of cellular telephony and voice mail services, and calculates large negative effects on consumer welfare. Prieger (September 2001) finds that during the period of “lighter regulation,” (1992-1995), the Bell operating companies introduced new information services, such as fax, voice mail, and audiotext, more rapidly. This experience is important for the assessment of Section 271 approvals that allow RBOCs to enter the long-distance market (discussed below).

The Effects of the 1996 Telecom Act. Much has been written about the effects of the 1996 Telecom Act. Hazlett (1999) found modest new entry in local telephony (where state monopoly franchises were abolished) and in cable television. In the latter, relaxation of telco/cable cross-ownership restrictions encouraged head-to-head competition by allowing new entrants to offer service bundles (video, voice and data) against incumbent cable and telephone operators. The largest effects of the Act may be attributed to “unannounced” goals – promoting mergers, getting congress into the policy loop and increasing campaign contributions.

Crandall and Hausman (2000) criticized key aspects of the 1996 Act – unbundling and TELRIC – on economic grounds. Crandall and Hausman note that the market for wireless telephony, where regulators have eased entry barriers and imposed no comparable regime to unbundling via TELRIC, has performed well (high subscriber growth, falling prices) compared to local wireline service. Entry by CLECs has been relatively modest, with true facilities-based competitors constituting only a fraction of the total.

Some other evidence tends to support this critical view. The percentage of U.S. households with telephones remained steady - at roughly 94% - from 1996 to 2000 (Statistics of Communications Common Carriers, 2000, p. 228.) Residential rates and connections charges have also remained steady in nominal terms, suggesting a slight decrease in real terms. (p. 232).⁹ Other evidence points in the opposite direction. One favorable economic development observed in the wake of the Act is the rise in spending on communications equipment. Figure 1 shows that communication equipment sales as a fraction of all durable good investment rose sharply from its historical 3 percent share, reaching 5 percent in 2000 and the first three months of 2001. Part of this no doubt was due to parallel forces, however, such as the diffusion of the personal computer and the rise of the Internet.

⁹ Interestingly, local “dial equipment minutes” have increase substantially from 1996 to 1999, from 2.4 to 3.4 trillion minute, about 11 percent per year. Growth in the 1980s and earlier had been less dramatic, typically 1 to 5 percent per year. However, the late-1990s increase likely represents the advent of the dial-up modem. Interstate and Intrastate calls increased at a robust rate, about 6 percent per year, arguably the result of declining rates. This can hardly be a success story because it involves a subsidy of dial-up service by voice traffic.

Political Constraints. An intriguing analysis of telecommunications infrastructure in 147 countries points to the importance of constraints on political actors in promoting the diffusion of telecom service. See Henisz and Zelner (2001). The number of telecommunications lines per inhabitant is strongly related to the degree to which the political systems constrain any one political actor from having an effect on government policy. (The measure is 0.0 on average for Algeria, China, Indonesia, Iran, Tunisia and Zambia, for example, and above 0.8 for Australia and the U.S.) Though ranked as relatively secure, the U.S. system hardly provides ironclad safeguards against investment-reducing actions. The prospect of regulatory changes that destroy equity values may reduce telecommunications infrastructure below its optimal level.

Regulation and Investment. The economic literature examining other markets suggests a negative correlation between telecom regulation and telecom investment. For example, Bittlingmayer (2001) finds that federal antitrust lawsuits suppressed investment in the period 1949-1990. Experience with bouts of “trust-busting” earlier in the century confirms the lesson: policy uncertainty, especially politically charged policy uncertainty is bad for financial markets and output.¹⁰ Similarly, research points to the role of political uncertainty in suppressing pharmaceutical stock prices and investment in the 1990s. Pirrong (1993) and Ellison and Mullin (1997) attribute substantial pharmaceutical stock price declines to the Clinton administration health care proposals.

III. Regulations Affecting Broadband

Regulations that potentially influence investment in broadband networks cover a wide range. Regulations now in effect for DSL include TELRIC pricing of unbundled network elements (UNE), including a complete bundle of unbundled elements allowing a firm to operate as a reseller (providing no infrastructure) while paying only TELRIC prices.¹¹ These rules mandate that incumbent providers cede a property right, or option, to rivals who may wish to use the incumbent’s facilities at some future point. Also important are looming changes in the regulatory environment. These include the Tauzin-Dingell bill,¹² and initiatives for “structural separation” of Bell operating companies. Cable television operators have thus far been successful in resisting the campaign to force systems to accommodate

¹⁰ See Bittlingmayer (1992, 1993 and 1996).

¹¹ Resale options are offered to CLECs, but are regulated such that retail-wholesale margins are about 20%. By assembling all network elements at the UNE prices, as determined by TELRIC rules, CLECs realize wholesale discounts of about sixty percent. This is called “UNE-P” (for “platform”).

¹² Tauzin-Dingell was introduced in July 1999, and is yet pending. The measure would allow Bell companies to transport data into long-distance markets. (Today Bell companies must receive 271 certification to provide long-distance services within a given state before gaining the right to send voice or data signals beyond the boundaries of the local service market in which they generate.) It would also block the FCC from imposing sharing obligations on advanced data networks constructed by ILECs. The FCC has generally refrained from imposing such obligations, but is free to change its policy.

independent ISPs wishing to use high-speed conduits to link to customers, yet “open access” rules are still being considered by the FCC.

TELRIC. The FCC’s formula for setting wholesale access rates has been one of the most contentious aspects of the 1996 Telecom Act. (Actual rates are determined at the state level, adding an extra layer of regulatory cost and uncertainty.) Though the TELRIC method attempts to replicate competitive pricing by looking forward and ignoring historical cost, this approach neglects the reality that entry decisions – including incremental investments by incumbent operators with substantial sunk capital – critically depend on expectations that historical costs *will be* recovered by the investors who make them. Excluding the full range of fixed investments from cost recovery thus undermines infrastructure creation incentives both at the ILECs, who subsidize their competitors to the extent they make fixed investments, and among the CLECs, to whom regulators award price discounts so long as they rent rather than own.¹³ Crandall and Hausman (2000) note that this system confers a free option on the ILECs competitors. If a new technology works and gains popularity with consumers, CLECs may offer it using the ILEC’s facilities at forward-looking cost. If the technology proves unprofitable, however, the ILECs absorb the loss because the CLECs are not required to make long-term commitments.

Setting access prices below long-run opportunity costs and awarding options at a price of zero constitute only part of the problem. Overarching policy uncertainty increases inefficiency. If markets were certain that TELRIC rates were low and forever fixed, investment alternatives could emerge. For example, instead of upgrading traditional wire networks to provide advanced services, incumbent telephone companies (and others) could build out wireless networks, where sharing obligations are less. Cable TV companies would have an extra incentive to offer cable-telephony. These circuitous pathways to telecom competition distort resource use, wasting valuable ILEC infrastructure.

There are, however, no guarantees that arbitrary pricing rules will remain fixed. The natural fluidity of the regime and its political elasticity, combined with TELRIC’s obvious infirmities on both economic and legal grounds, keep TELRIC rules constantly in play. Congress, the courts, and the FCC may trim, toughen, or eliminate TELRIC rules. The resulting uncertainty gives all parties an increased incentive to wait and see – in effect, capturing option value -- since the optimal investment response will depend on what happens.

¹³ Indeed, CLECs building their own facilities themselves become subject to mandatory access provisions. While not as onerous as those imposed on incumbent local exchange carriers, the CLECs note that this burden reduces their ability and economic incentive to raise capital for such projects. Cox Cable, in describing the financial returns available from upgrading its cable television platform to deliver advanced services, tells its shareholders that sharing obligations are burdensome even to upstart rivals. “These requirements also place burdens on new entrants that may benefit their competitors. In particular, the resale requirement means that a company can seek to resell services using the facilities of a new entrant, such as Cox, without making a similar investment in facilities.” Cox Cable, Securities and Exchange Commission form 10K (2000), pp. 27-28.

Uncertainty has enveloped TELRIC from its inception. Whether the FCC even had the power to impose TELRIC rules has occupied courts in one form or another since 1996. The Supreme Court finally decided the FCC did have power to impose prices under the Act, but only if “necessary” and if the new entrant’s ability to compete would be otherwise “impaired.” In current litigation, the Supreme Court will decide whether the FCC’s implementation of this power is legal. A federal appeals court overturned a plan previously approved by a district court. The U.S. Supreme Court heard the appeal in October 2001.

TELRIC also faces opposition from influential members of Congress such as Senator John McCain (R-AZ). In addition, TELRIC has come under withering criticism from Alfred Kahn (2001), the dean of U.S. regulatory economists. With the financial demise of facilities-based CLECs and compelling economic criticism, TELRIC’s scope may be trimmed, but only time will tell. In the meantime, investors in telecommunications infrastructure have an additional incentive to wait for regulatory events to sort themselves out.

Unbundled Network Elements. The 1996 Telecom Act allows competitors of the ILECs to access ILEC facilities. As interpreted by the FCC, the rules have been crafted to provide large discounts to new rivals that take advantage of ILEC network sharing. This may have encouraged entry by CLECs, even as the implicit regulatory subsidies have been insufficient to sustain it. Offsetting the price discounts in TELRIC are substantial sunk costs in customer acquisition; even firms that receive cheap transport for communications service must invest substantial sums to market, procure, and retain subscribers. Beard, Ford & Spiwak (2001, p. 14) find that “for every dollar of investment in plant and equipment, an additional \$2 of entry costs are incurred” by the average CLEC.

To the degree the sunk cost entry barrier is effectively mitigated by TELRIC access rules, there is a self-limiting aspect to entry subsidized through low access charges. New entrants achieving economic profitability by virtue of TELRIC pricing attract still more entrants to mimic such business strategies. The lack of property rights creates a tragedy of the commons: truly free entry destroys incentives to enter. It appears clear that FCC regulators did seize the opportunity to promote new entrants rather than efficient competition (where least cost providers enjoy the right to exclude others from competing on equal terms). Alfred Kahn (1998) finds that commissions regulating electricity, communications, and other sectors have difficulty resisting the urge to subsidize new competitors by appropriating the sunk capital of incumbent firms. (Kahn subtitles his book: *Temptation of the Kleptocrats and the Political Economy of Regulatory Disingenuousness.*)

Underlying the emphasis on cheap access pricing is the implicit assumption that one physical infrastructure will continue to dominate. This assumption pushes regulators to pursue measures bringing multiple service providers onto the sole available platform. Ironically, this approach becomes a self-fulfilling prophecy as potential entrants see the relative price of resale competition decline while the relative price of competitive facilities rise. Efficient regulation encourages entrants to discover and exploit low cost service options, and access regulations can lead to

optimal outcomes where firms face the full opportunity cost of their actions. Yet, the informational requirements in discerning such opportunity costs, and establishing the right balance between short-term and long-term opportunities, yields a standard preference for market solutions wherever competition – even imperfect competition as in duopoly or oligopoly solutions – can be observed.¹⁴ Since cable modems and DSL provide alternative delivery mechanisms for broadband, the logic of UNE mandates (as well as cable open access controls) are rendered dubious. Such requirements, however, plausibly act as a drag on investment by RBOCs whose broadband DSL services struggle to capture market share from dominant cable modem service providers.

Telecom Mergers. The merger climate deteriorated significantly with the Department of Justice’s opposition to the Sprint / WorldCom merger, and its subsequent collapse, in July 2000. Regulatory defeat came even as Sprint is unlikely to survive as an independent entity; denying WorldCom may well save Sprint for an RBOC that emerges with permission to provide long-distance service across its in-region area of dominance.¹⁵ Moreover, some analysts pointed to a special broadband angle. The merger between Sprint and MCI WorldCom would have given new impetus to the “fixed wireless” approach to broadband delivery.¹⁶ Economies of scale, as could have been created by the merger, are particularly important in rolling out new technologies in consumer markets both because R&D expenditures are more easily amortized and because marketing synergies appear where a given customer base (say, of long distance users) can be converted to enhanced services (say, local exchange, plus broadband access, plus long distance) in a relatively seamless manner economizing on consumer switching costs.

Blocking Sprint’s attempt to sell its shares to the high bidder (WorldCom) creates dynamic effects; for instance, investments to spruce up other merger candidates become less likely. The innovative product or ambitious geographical expansion that might have attracted buyer interest becomes more of a gamble.

Section 271 Long Distance Entry. Section 271 of the Telecom Act sets out the terms under which RBOCs are allowed to provide long-distance service within their local exchange territories, in essence lifting the restrictions imposed by the MFJ (and

¹⁴ This policy preference is readily observed in telecommunications. Cellular telephone licenses were issued in the U.S. during 1984-89, two per market. The regulatory regime adopted allowed free market pricing, despite the fact that one of the two licenses issued in each market was assigned to the local incumbent telephone monopoly (wireline). In cable television, rate regulation was imposed in the 1992 Cable Act, but deregulation was automatic in any local market where a second entrant achieved market penetration of fifteen percent of households – no third firm required.

¹⁵ The 271 application process created in the 1996 Act stalled until Verizon won the right to provide long-distance telephone service to its New York state customers in December 1999, but now appears to be heading for completion (with all fifty states granting 271 applications) by the first quarter of 2003. Precursor Watch: Key Government Decisions Affecting the Telecom/Media Sectors (Oct. 16, 2001). See www.precursor.com.

¹⁶ Elizabeth Douglass, *The Cutting Edge: Focus on Technology: Wireless Cable May Prove Golden Alternative to Copper Wires; Telecom: MCI WorldCom and Sprint Could Eventually Deliver High-Speed Internet Access to More than 50 Million Homes via a ‘Third Line,’* L.A. TIMES (October 11, 1999), C4. *MMDS High on MCI Worldcom Agenda?* COMMUNICATIONS TODAY (April 6, 2000), Vol. 6, No. 65.

Judge Green) and imposing a new set of rules. Ostensibly intended to spur local competition,¹⁷ the certain effect is to forestall long distance competition and delay integration of local and long-distance service.

The economies of scope between local and long-distance are evidently powerful, but LATA boundaries pre-empt their realization. Opponents of RBOC entry view Section 271 permission as the carrot before the donkey: RBOCs get permission only when they have opened up their local markets to competitors. Proponents of RBOC entry argue that delaying long-distance competition holds telephone customers hostage, particularly when the RBOCs are poised to efficiently roll-out the service bundles most demanded by small residential customers. Not only are the gains from using long-distance entry as a bargaining chip speculative, they create perverse incentives, prompting IXCs to delay entering local markets (thus enhancing applications for RBOC entry into long-distance) and producing a quandary for regulators: if the carrot appears to be working (i.e., local markets are opening), does that imply that they should continue to block RBOC entry into long-distance, or reward the RBOC by removing the barrier?

The initial evidence gleaned from markets in which 271 applications have been granted – New York, where Verizon began offering long distance service in December 1999, and Texas, where SBC entered the long distance market in July 2000 – suggest that substantial benefits do attend RBOC entry. Hausman, Leonard and Sidak (2002) find long distance bills nine percent lower in New York, 23 percent lower in Texas, following entry. They also find local telephone competition, as measured by CLEC market share, intensifying with 271 approval.

Cable “Open Access.” U.S. policy traditionally puts cable TV outside the common-carrier framework. However, “open access” would turn broadband into a common carrier wholesale transport service. As a result, cable system bandwidth allocated to broadband runs the risk of being subject to price regulation. The threat of common carrier status explains why comparatively little of the available spectrum – 6 MHz out of a total of 750 MHz on a state-of-the-art system – is dedicated to two-way, high-speed Internet access. Hazlett (this volume) argues that the push for “open access” itself confirms, and reinforces, the defensive architecture used by cable operators to guard against regulatory appropriation.

Though the threat of “open access” poses dangers, cable has remained relatively unencumbered by regulation, which a number of analysts credit for its comparative success in the residential market. Hazlett and Bittlingmayer (2001) point to the victory of “closed” cable over “open” DSL in the marketplace as evidence that “open access” would hamper broadband expansion. Industry analysts draw a similar inference. According to Blake Bath, analyst at Lehman Brothers: “The reason that the cable companies really stepped up their investment in 1997 and beyond was they were not regulated, they weren’t forced to open up their networks. There were multiple revenue streams that they could address. They could price the services however they wanted.” (Quoted in Thierer [2001], p. 15.)

¹⁷ A good description of the 271 process, and a defense of its economic logic, is found in Schwartz 2000.

Structural Separation. AT&T and the CLECs have supported efforts to break up the regional Bell operating companies into wholesale and retail units. State-level initiatives have taken place in Pennsylvania, New York, New Jersey, Maryland, Virginia, Tennessee, Florida and Minnesota. Pennsylvania in fact required “functional separation,” but this fell far short of what RBOC critics demanded. More recently, AT&T has pursued structural separation at the federal level.¹⁸ The likelihood of actual legislation seems slim at the moment. Arguably, the aim of the “structural separation” movement may be to divert managerial attention at the RBOCs and influence their behavior by increasing regulatory risk.

IV. Regulation and Broadband – Existing Research

A recent study by James Prieger (Sept. 2001) finds that a number of factors influence availability of broadband access. Positive influences include local market size, educational level and commuting distance. Interestingly for the discussion of Sec. 271 approvals, structural separation and telecom mergers, high-speed access is found to be more likely in the zip codes where Bell companies operate. Statistically, each of the four RBOCs (BellSouth, Qwest, SBC and Verizon) had a positive effect. In contrast, the presence of CLECs had a positive but statistically insignificant association with broadband penetration. These results do not support the theory that the TELRIC/UNE regime designed to encourage growth of non-facilities-based CLECs has been successful.

V. Open Access

The fight over cable open access was at the center of the broadband debate for much of the last few years. It figured prominently in AT&T’s mergers with TCI and MediaOne, and in the AOL / Time Warner deal. Initiatives in various localities, including Portland, Broward County and San Francisco, provoked controversy. Calls for open access have subsided, though pressures may re-emerge if cable’s share of the residential broadband market were to increase.

What effect did the often-contentious debate over open access have on broadband development? We argued above that the clamor for open access prompts the cable industry to parsimoniously allocate cable system spectrum in order to pre-emptively lower regulatory risk. (Were open access rules to be applied, they would regulate a smaller portion of the communications capacity of cable systems than if cable systems optimally utilized bandwidth.) Similarly, implementation of open access

¹⁸ Yochi J. Dreazen, AT&T Ratchets Up Efforts in Washington Pushing Bell Breakup Plan, Wall Street Journal, August 28, 2001.

would reduce incentives to build out the (currently) most successful broadband platform.

Table 1 displays financial returns for an Internet stock index and Excite@Home shares around dates with significant developments for open access. These are abnormal returns, adjusted for the same-period returns of the S&P 500. We list 21 events during which open access suffered *Setbacks*, and eight dates on which open access enjoyed *Victories*. Examples of setbacks include: AT&T/TCI merger, AT&T/Time Warner merger rumors, AtHome/Excite merger, Comcast/MediaOne merger, FCC rejection of open access, AOL/Excite merger rumors, court rulings against open access, Comcast/Excite@Home rumors. Examples of victories: Portland judge rules against AT&T, Broward & Pittsburgh vote in favor of open access, FCC vows scrutiny of AOL/Time Warner merger, rumors of regulatory action against deal, deal in trouble.

The Internet Index return reveals how investors evaluated the likely consequences of open access. We include Excite@Home returns to indicate whether selected dates are plausible regulatory events. Excite@Home was the exclusive ISP for a number of cable companies, including AT&T and Comcast, and its business strategy was highly dependent on “closed access.”

Setbacks for open access produced statistically significant positive abnormal returns for Excite@Home, consistent with the view that investors saw the selected regulatory events as important victories for the firm. However, these setback dates were also correlated with positive abnormal and statistically significant returns for Internet stocks. This tends to support the view that investors saw open access regulation as slowing broadband deployment. Similarly, *Victories* for open access were correlated with negative returns for Excite@Home shareholders and for those owning equity in the firms composing the Internet Index. The latter results, however, are not statistically significant.

Various interpretations are possible, but none is favorable to the view that “open access” would have promoted the Internet. The most plausible conclusion to be drawn is that investors saw cable open access regulation as detrimental to broadband infrastructure investment.

VI. Tauzin –Dingell

Glassman and Lehr (2001) have presented what they purport to be an “event study” showing that the Tauzin-Dingell proposal, while yet to pass either house, is accountable for a massive decline in the capitalization of CLECs. They assert that almost half of the 84 percent decline in CLEC stocks from March 14, 2000 to May 10, 2001 occurred during windows in which the bill’s prospects for passage increased. They then argue that this decline in the market capitalization of CLECs reduced investment in broadband.

Hazlett (2001) demonstrates the Glassman-Lehr financial methodology is fundamentally flawed and that the asserted conclusion (regarding reduced broadband investment) would not follow even if the empirical analysis were correct. Rather than selecting actual event dates on which Tauzin-Dingell (or its predecessor legislation) saw significant gains or reversals in Congress, Glassman-Lehr examine only the nine worst days for a portfolio of CLEC stocks during the period March 14, 2000 to May 10, 2001. Seven of these days occur in March/April 2000; two in April 2001. See Figure 2. (The CLEC index used is not described by the authors, precluding replication of the asserted results.) They then argue that each of the nine days was associated with Tauzin-Dingell events (occurring the day before, the day of, or the day after the sharp decline in the CLEC index) and that such events caused one hundred percent of the declines observed on those days.

The Glassman-Lehr method demonstrates extreme sample selection bias. By excluding all dates with positive CLEC returns by design, by using a loose standard for what constitutes a Tauzin-Dingell event, and by excluding all other explanations for CLEC declines from the analysis, the “results” are pre-ordained. That T-D is driving CLEC returns on the dates selected is an unsupported assumption; CLEC returns are not adjusted for market movements, and the NASDAQ declines sharply across all nine event dates. Moreover, ILEC returns (for SBC, Verizon, Qwest, and BellSouth) decline both absolutely and relative to the S&P500 over the nine “events.” If CLEC declines infer that T-D is pushing the Bells to greater monopoly power over the CLECs, it is curious that the Bells enjoy negative returns as a result.

In fact, the “events” selected by Glassman-Lehr are not Tauzin-Dingell events. They are merely news stories about T-D, or related topics, that occur on or near highly negative days for U.S. equities. Throughout the 14-month sample period, a Lexis-Nexis search finds 9.8 articles per trading day that mentions “telecommunications” and either “Tauzin” or “Dingell.” There are only two three-day periods over the entire sample without such a news item. And, because days with positive CLEC returns have been explicitly eliminated, no correlation between T-D events and CLEC returns is actually estimated.

Table 2 summarizes results from an actual event study analysis of Tauzin-Dingell reported in Hazlett 2001. It divides a sample of 38 CLECs into UCLECs, those firms that rely heavily on UNEs provided at regulated rates by ILECs,¹⁹ and FCLECs, firms that rely more on their own facilities to serve telephone customers.²⁰ This division is important to the analysis because a finding that CLEC returns are systematically negative during windows in which Tauzin-Dingell’s passage becomes more likely is difficult to interpret. Glassman & Lehr erroneously report finding such a correlation and then consider only one interpretation: that the passage of Tauzin-Dingell will

¹⁹ Twenty six firms were identified: Allegiance, Choice One, Convergent, CoreComm, Covad, CTC, Cyprus Comm., DSL.Net, e.spire, Focal, General Comm., ICG, Intermedia, ITC^DeltaCom, Log on America, McLeodUSA, Mpower Comm., Net2000 Comm., Network Access Solutions, Network Plus, Northpoint Comm., NTELOS, Pac-West Telecom, Rhythms NetConnections, US LEC, USOL Holdings.

²⁰ Twelve firms were identified: Adelphia Business Solutions, Advanced Radio Telecom, Allied Riser, Electric Lightwave, FiberNet Telecom, Nucentrix, RCN, Speedus.com, Teligent, Time Warner Telecom, Winstar, XO Communications.

allow Bell companies to offer less cooperation with the sharing requirements imposed by regulators.

An omitted alternative explanation is that CLECs – as competitors to ILECs – will be hurt when their larger, stronger rivals are less constrained in building long-distance facilities for carrying data traffic. As the Precursor Group, a firm that interprets telecommunications regulations for investors and pension funds, notes: “inability to carry traffic end-to-end is a competitive disadvantage for the Bells.”²¹ Tauzin-Dingell is targeted at ending this “competitive disadvantage for the Bells” in data services. By breaking the CLEC sample into those firms that primarily rely on ILEC infrastructure to serve customers vs. those relying on their own facilities, it is theoretically possible to observe which effect is in evidence.

Sixteen trading days featured substantial news regarding what became the Tauzin-Dingell legislation during the January 4, 1999 to June 14, 2001 period. (This longer period is examined because it includes the introduction of Tauzin-Dingell, in July 1999, as well as the introduction of two predecessor bills, by Senators Brownback and McCain, respectively, in the months preceding.) Over this period, CLECs generally exhibited *positive*, but not statistically significant, market-adjusted returns. Facilities-based CLECs (FCLECs) had statistically significant *positive* returns during the sixteen event windows. ILECs (all four remaining RBOCs – Qwest, SBC, Verizon and BellSouth), exhibited *negative*, if statistically insignificant, abnormal returns. Splitting the sample into 12 pro-T-D and 4 anti-T-D news events does not change results.²² This analysis calculates an actual correlation between T-D events and CLEC returns, but the correlations are in the opposite direction from that asserted by Glassman-Lehr. Because the returns fit no predictable pattern, they are best described as noise. The Tauzin-Dingell bill exhibits no observed effect on CLEC (or ILEC) stock prices.²³

As an economic matter, this finding is not particularly interesting, however. The more fundamental failing of the Glassman-Lehr analysis is to equate CLEC welfare with consumer welfare. Legislation allowing ILECs greater leeway to build and operate their networks enhances competitive alternatives to CLECs. If it works precisely as advertised, Tauzin-Dingell would both increase total broadband deployment and reduce the market prospects of CLECs (UCLECs and FCLECs). Hence, if plausible empirical results did show CLEC declines associated with T-D progress, the evidence would *still* be consistent with the pro-efficiency view of T-D.

²¹ Precursor Watch: Key Government Decisions Affecting the Telecom/Media Sectors (Oct. 16, 2001), p. 1.

²² Pro T-D events: Brownback introduces predecessor legislation, McCain introduces predecessor legislation, Tauzin supports data deregulation bill, first major paper reports Congress considering T-D bill, T-D introduced, Tauzin may get House Commerce Chair, Tauzin to be chair, Tauzin vows to revamp Telecom Act, Bells and rivals gear up for battle, Tauzin to reintroduce TD, bill to loosen regulation of BOCs, House panel clears Tauzin-Dingell. Anti-T-D events – Conyers bill counters T-D, Jeffords party switch changes Senate majority, House Judiciary Comm. deals “body blow” to T-D, Hollings highly critical of T-D.

²³ The fact that this legislation has not been considered close to enactment, and that there have not been dramatic political swings that would markedly change this assessment, makes it difficult to identify actual legislative events calibrating equity market reactions. Hence, this result is not surprising.

This leaves a question unanswered: What did cause the precipitous decline in CLEC shares? First, there is an extremely sharp drop in technology shares in general over the period selected by Glassman-Lehr. The Nasdaq Composite Index declined 57% over the period reviewed in Glassman Lehr.²⁴ Given that the CLECs analyzed in Hazlett 2001 demonstrated betas averaging about 1.3, the direction of the market and the volatility of CLEC equities would combine to produce returns of about -74%. Hence, 88% of the CLEC decline is explained simply by the general collapse of tech stocks over the period examined.

In addition to these aggregate trends, segments of the communications sector were hit particularly hard by the abrupt market turnaround. Market leaders such as Cisco, Nortel, and JDS Uniphase exhibited declines of 72.7%, 77.4%, and 89.6%, respectively, over the March 10, 2000 to May 14, 2001 period selected by Glassman-Lehr – matching, or outstripping, the losses of CLECs. More targeted still is the decline in wide area network providers – firms like Global Crossing (which filed for bankruptcy protection in early 2002), Metromedia Fiber Networks, Level 3, and Williams. This sub-sector exhibits a decline in market capitalization that hugs the CLEC financial path throughout 2001. See “Fiber Infrastructure” performance in Figure 3. Included in the portfolio is Genuity, the spin-off from GTE (as part of the GTE-Verizon merger agreement, satisfying long distance restrictions). This firm touts Verizon as a strategic partner, and analysts tout Genuity as a prime take-over (re-acquisition) target for Verizon when its 271 applications are approved.²⁵ Despite its cozy RBOC relations, it declined 88% from its September 2000 IPO through February 10, 2002.

Figure 3 displays another financial trend of interest. While even the larger players in telecommunications suffered substantial equity declines in 2001, the best performers were the long distance carriers. Rather than flourishing with the CLEC decline, as under the Glassman-Lehr assertion that Tuzin-Dingell is helping the RBOCs maintain or re-establish monopoly power, the ILECs decline by more than the S&P 500, the relevant market index. On the other hand, the long distance carriers actually outperform both the Nasdaq and the S&P 500 in 2001. This pattern suggests that market trends, not the threat of Tuzin-Dingell legislation, are driving financial returns in the sector.

Within the financial analyst community, a consensus has arisen explaining how the CLECs – in many respects like the dot.coms – exhibited such a meteoric rise and

²⁴ Glassman-Lehr calculates the Nasdaq decline as 55%, and then states that excluding the 38 CLEC shares from the Nasdaq reduces the index’s decline to 48%. Both calculations are incorrect. The Nasdaq decline from March 14, 2000 (close of trading March 13) through May 10, 2001 was 57%. G-L states that the CLECs declined 84%, from a market capitalization of \$242 billion to a market cap of just \$38 billion. That would make the CLEC component about 3.8% of total index value at the beginning of the period. Calculating the overall Nasdaq return as a weighted average implies that the CLEC-less Nasdaq return, March 14, 2000 through May 14, 2001, was actually about 56% (not 48%).

²⁵ “Verizon spun off majority control of [Genuity] over period of time as condition of GTE merger,” writes COMMUNICATIONS DAILY (November 14, 2001, p. 2). Verizon CEO Ivan “Seidenberg said decisions about whether to take back that stake or complete spinoff weren’t likely to be issue until 2003 because company still would be making its way through Sec. 271 long distance approval process.”

fall in financial markets. This striking pattern is exhibited in Figure 2; the incredible out-performance of the Nasdaq by the CLEC sector in 1999 (concurrent with the period in which Tauzin-Dingell was introduced by two of the most powerful members, one Republican, one Democrat, in the House of Representatives), is matched by the sudden collapse of the sector in 2000-2001. As one analyst sums up:

It was with great hope in 1996 that a group of feisty new upstarts called CLECs hoped to take on the ILECs. Now, just five years later, the hopes of most CLECs have been dashed. Simply put, margins available from resale UNE-L, UNE-P were insufficient owing to high customer acquisition costs, particularly in the residential market. And capital markets – at least so far – have rebuffed overtures by many CLECs to raise additional funds to take ILECs head-on, facilities-style. Now, the few surviving CLECs have scaled back their business plans and retrenched. CLECs now are focused almost exclusively on the business market, relegating the consumer market to the back burner for the foreseeable future.²⁶

Two aspects of this view of the financial marketplace are of note. First, the regulatory structure for competitive telecommunications was not well conceived. The possibility of entry was created, but it was not sustainable; in the absence of any requirements for entrants (who could lease all delivery systems at substantially discounted prices from incumbents), the cavalcade of new rivalry pushed up customer acquisition costs across the board, even for facilities-based entrants using few if any pieces of the ILEC's network. These costs overwhelmed the CLEC sector generally, shut the financing window for facilities-based business models, and led to rapid exit. A thinner field should help survivors regain their financial bearings, but it remains to be seen where a stable equilibrium will be established.

Second, in exiting the residential market, CLECs focus on the business market. This is economically efficient: business markets tend to be geographically denser and thicker in terms of demand, allowing more economical use of fixed capital; prices tend to be far in excess of costs due to historic patterns of regulation. But in continuing to lose market share in this lucrative segment, the ILECs can at best be said to have successfully defended their low-margin residential services. This is difficult to attribute to rent-seeking legislative strategies, which would presumably attempt to achieve just the reverse outcome (cede the unprofitable, defend the profitable). Real economic forces appear to be driving this pattern of entry and exit.

VII. The Effects of 271 Approvals and Denials

Background. Under Section 271 of the 1996 Telecommunications Act, the Bell operating companies may receive permission to offer inter-LATA (local area transport

²⁶ JP Morgan Equity Research, *The Cable Industry* (Nov. 2, 2001), 41.

and access) services within their home markets, provided they convince the FCC and state regulators that they have opened up their local markets to competition.²⁷

The effects of 271 approvals – and denials – on consumers are highly controversial. The IXC and CLECs argue that allowing the Bells to offer long-distance service removes one of the few levers regulators have to get the Bells to open up their local loop to competitors. The RBOCs argue that keeping them out of long-distance restricts rivalry and raises rates. At a minimum, the restriction prevents the Bells from realizing economies of scope in the provision of short- and long-distance service within their service areas for some substantial period of time.

The table in the Appendix lists events associated with Sec. 271 approvals and denials. A quick glance shows that three of the four remaining Bells (Verizon, BellSouth and SBC) have received approval or moved the process along successfully in a number of states. Qwest has not done so, as it pursues a large multi-state effort. Progress has not been uniform, and the Bells have also suffered setbacks. For details of this process, see the report by Legg Mason (2001).

Speedy and lax approvals generate long-distance competition, but may reduce benefits from local competition. Consequently, Bell opponents emphasize the importance of access to the local loop. Every premature approval can undermine the realization of local service and price competition. Presumably, suppliers of inputs and complementary products suffer if this anti-competitive result obtains. Such firms, as well as large telecommunications users, should exhibit negative returns associated with 271 approvals under this view.

Proponents of rapid 271 approvals emphasize the benefits of long-distance competition and downplay the importance of local competition as measured by market shares of CLECs.²⁸ They imply that expansion of high-speed inter-LATA service will lead to increased demand for equipment and products complementary to that service. Here, “equipment” encompasses network infrastructure, customer premises devices, and vertically related transport service.

Stock Market Effects. The effect of Sec. 271 approvals on RBOC stock prices is clear. Under any view, approvals should increase or at least not lower RBOC stock prices. Similarly, Sec. 271 denials should decrease or at least not raise RBOC stock prices.

The two views diverge in their prediction for other, vertically related businesses. Critics of rapid 271 approvals offer arguments implying that suppliers of inputs and complementary products in telecommunications would suffer from too-speedy approvals.

²⁷ The Department of Justice also plays an official role in this process, offering expert consultation to the FCC.

²⁸ Given that local telephone access is a heavily regulated service, one argument is that price controls substitute for market competition. To the degree that the existing regime actually cross-subsidizes local (residential) telephone access, the argument becomes even more compelling: Why would one expect to see much competitive entry in a market that is already constrained to charge the efficient (or below the efficient) price?

Similarly, defenders' claims suggest that the same suppliers will benefit from an expansion of actual inter-LATA service.

We examine the performance of key indices and individual stocks around 271 application events.

- The Amex Internet Index: a “modified market-capitalization weighted” index composed of fifty Internet stocks, including Amazon.com, AOL, Cisco, Juniper Networks, Novell, 3Com, Reback Networks, United Technologies Corp., WebMD and Yahoo!
- The Philadelphia Semi-Conductor Index (SOX): a price-weighted index of 16 U.S. companies involved in the design, manufacture or distribution of semiconductors. Components include Novellus Systems, Linear Technology Group, Micron Technology, National Semiconductor, Texas Instruments, Intel, LSI Logic and Motorola.
- Important individual companies with widely followed strategies linked to broadband infrastructure: AOL, At Home, Cisco, Level 3, Sun and Yahoo!

Sec. 271 Approvals and Denials and Internet Returns. Using dates from a recent Legg Mason report and a Lexis-Nexis search of Sec. 271 developments, we generated a list of 45 events positive for 271 approvals and 21 negative events. Examples of positive events include application filings, application approvals, and favorable court rulings. Examples of negative events include denials of applications, delayed votes, and adverse court rulings. The list of events appears in the Appendix.

To investigate whether these Sec. 271 events are associated with movements in stock prices for RBOs, IXCs, selected tech sectors and individual tech firms, we estimate regressions of the form

$$R_{it} = a + b M_t + c_1 POS_{t+1} + c_2 POS_t + c_3 POS_{t-1} + d_1 NEG_{t+1} + d_2 NEG_t + d_3 NEG_{t-1} + e_t$$

where R_{it} is the return on day t of sector or firm i , M_t is the return on the market portfolio, POS_t is a dummy variable set equal to one if an event favorable to Sec.271 approvals occurred on day t , and NEG_t is defined similarly for unfavorable events. The sum of the c 's and d 's represent the cumulative effect of positive and negative developments estimated over three-day windows (with an event occurring on the middle trading day, t).

Tables 3 and 4 report the estimated coefficients as well as absolute values of the associated t -statistics. (These returns are adjusted for overall market movements by the inclusion of M_t as an explanatory variable in the estimated regressions.) As expected, IXC stock prices tend to decline with positive Sec. 271 developments. Conversely, IXC stock prices increase with negative developments, though not significantly. It turns out,

however, that this lack of statistical significance is due to the inclusion of AT&T. A portfolio of Sprint and WorldCom produces the results one might expect, namely positive excess returns when Section 271 approvals are denied. These results tend to support the idea that the selected Sec. 271 dates are in fact relevant and correctly signed.

Results tend to be lackluster. The estimated coefficient closest to statistical significance indicates that the Internet Index declined with negative news for 271 applications. Other estimates, outside of IXC returns, show no systematic correlation with 271 events. Even RBOC returns – which should, by any theory, exhibit a positive correlation with 271 events – fail to demonstrate significant reactions. This may be due to aggregation; individual applications primarily impact the firm submitting it. Further examination, including disaggregation, may yet illuminate.

Observing the individual stock reactions of major Internet suppliers Cisco, Level 3, and Sun, for instance, yields some interesting information. These three equities experience substantial negative returns when ILECs experience unfavorable Sec. 271 developments. Cisco makes routers used in Internet backbone facilities and in local- and wide-area networks, as well as Internet software. Similarly, Sun Microsystems produces network computing equipment and storage products. A positive correlation between returns for these shares and RBOC Sec. 271 progress is consistent with the view that RBOC entry into long-distance is expected to stimulate investment in high-speed data networks.

Level 3 provides the strongest declines in response to setbacks to Sec. 271 approvals. As a wholesaler, Level 3 gains when retail competition intensifies in long-distance. Moreover, in the absence of 271 relief, the RBOC's have little incentive to acquire long-distance properties. Level 3's strategy has focused on wholesale provision of long-distance transport, either on leased facilities or over its own network. In fact, Level 3 has contracted to provide long-haul services to Verizon.²⁹

The industry may, however, consolidate vertically in the absence of regulatory restrictions, especially the 271 restrictions blocking RBOCs from long distance. Deregulation could make Level 3 a likely takeover target, a mirror image of the Qwest purchase of US West.³⁰ A recent Legg Mason report recognizes this in another context in its discussion of Verizon: "The company cannot reconsolidate Genuity, the former GTE data subsidiary (including a long-distance network), without 271 relief." In fact, Verizon itself stated its desire to regain the company it was forced to divest because of its local market quarantine.

These results are not determinative. Further work may better reveal which 271 actions generated financial market reactions, and the pattern those effects created in complementary segments of the telecommunications sector.

²⁹ *Level 3 Seeks New Dance Step*, COMMUNICATIONS TODAY (July 19, 2001), Vol. 7, No. 136. *Level 3 Lands 'Significant' Contract with Verizon*, COMMUNICATIONS TODAY (July 17, 2001), Vol. 7, No. 134.

³⁰ A more apt analogy may be the rumored takeover of Qwest by Deutsche Telekom, apparently abandoned because of Qwest's simultaneous offer for US West.

VII. Concluding Comments

Some analysts view the broadband market as stifled due to insufficient regulation – no open access in cable, no structural separation of the RBOCs, too-easily granted 271 applications, and a too-lax set of unbundling rules for local exchange carriers mandated to share their networks with competitors.

Others see regulation smothering market incentives – too-low TELRIC prices and unbundling requirements too harsh to adequately compensate for risk-taking in a market dependent upon massive infusions of capital for rapid development. The threat of common carrier status in cable and the risk of structural separation of the RBOCs, along with the reality of extensive sharing obligations for existing phone networks, are seen as disincentives to investors and entrepreneurs.

The stock market evidence tends to support the second position, suggesting that deregulation would help broadband rollout.

- (1) Setbacks for “open access” regulation have increased expected returns for operators, increasing investment incentives both for cable companies and for firms that provide complementary content and services.
- (2) The debate over Tauzin-Dingell has played no visible role in the demise of the CLECs.
- (3) Financial returns of key telecommunications sub-sectors suggest that Section 271 long distance approvals for RBOCs have not harmed Internet companies, though denials may have. The approvals negatively impacted long-distance companies, but they have not hurt the Internet, and by inference, the rollout of broadband.

The sum of these results, a number of studies in the regulation literature, and the economic logic of mandated network sharing obligations all point in the same direction. To stimulate rapid deployment of broadband services, deregulation of common carrier obligations for advanced services is the recommended policy.

References

- Ai, Chunrong and David E. M. Sappington, “The Impact of State Incentive Regulation on the U.S. Telecommunications Industry,” working paper, March 2001.
- Beard, T. Randolph, George S. Ford, and Lawrence J. Spiwak, “Why ADCo? Why Now? An Exploration into the Future of Industry Market Structure for the ‘Last Mile’ in Local Telecommunications Markets,” Phoenix Center Policy Paper No. 12, November 2001.
- Bortolotti, Bernardo; Juliet D’Souza; Marcella Fantini; and William L. Megginson, “Sources of Performance Improvement in Privatized Firms: A Clinical Study of the Global Telecommunications Industry,” Fondazione Eni Enrico Mattei, Working Paper, April 2001.
- Bittlingmayer, George, “Stock Returns, Real Activity and the Trust Question,” *Journal of Finance*, December 1992.
- Bittlingmayer, George, “The Stock Market and Early Antitrust Enforcement,” *Journal of Law and Economics*, April 1993.
- Bittlingmayer, George, “Antitrust and Business Activity: The First Quarter Century,” *Business History Review*, Autumn 1996.
- Bittlingmayer, George, “Investment and Antitrust Enforcement,” *Cato Journal*, Vol. 3, No. 2, Winter 2001.
- Crandall, Robert W., “An Assessment of the Competitive Local Exchange Carriers Five Years,” working paper, June 2001
- Crandall, Robert W. and Charles L. Jackson, “The \$500 Billion Opportunity: The Potential Benefit of Widespread Diffusion of Broadband Internet Access,” *Criterion Economics*, July 2001.
- Ellison, Sara Fisher and Wallace P. Mullin, “Gradual Incorporation of Information into Stock Prices: Empirical Strategies,” NBER Working Paper No. W26218.
- Glassman, James and William Lehr, “The Economics of Tauzin-Dingell: Theory and Evidence,” working paper June 11, 2001, <http://ebusiness.mit.edu/research/papers/128%20Lehr,%20Tauzin-Dingell.pdf> (visited Feb. 11, 2002).
- Greenstein, Shane; Susan McMaster and Pablo T. Spiller, “The Effect of Incentive Regulation on Infrastructure Modernization: Local Exchange Companies’ Deployment of Digital Technology,” *Journal of Economics and Management Strategy*, Vol. 4., No. 2, 1995.
- Hazlett, Thomas W., “Economics and Political Consequences of the 1996 Telecommunications Act,” *Hastings Law Journal*, Vol. 50, No. 6, August 1999.
- Hazlett, Thomas W., “Broadband Regulation and the Market: Correcting the Fatal Flaws of Glassman-Lehr,” working paper July 12, 2001, <http://www.manhattan-institute.org/hazlett/conf010712.pdf>.
- Hazlett, Thomas W. and George Bittlingmayer, “The Political Economy of Cable ‘Open Access,’” *Stanford Technology Law Review*, forthcoming Fall 2001.
- Henisz, Witold J. and Bennet A. Zelner, “The Institutional Environment for Telecommunications Investment,” *Journal of Economics & Management Strategy*, Vol. 10, Number 1, Spring 2001.
- Hausman, Jerry, “Valuing the Effect of Regulation on New Services in Telecommunications,” *Brookings Papers on Economic Activity: Microeconomics*, 1997.

- Kahn, Alfred, Letting Go: Deregulating the Process of Deregulation, or: Temptation of the Kleptocrats and the Political Economy of Regulatory Disingenuousness (Institute of Public Utilities and Network Industries, Michigan State University), 1998.
- Kahn, Alfred, Whom the Gods Would Destroy, or How Not to Deregulate, (Washington, D.C.: AEI-Brookings Joint Center for Regulatory Studies), 2001.
- Lehman, Dale E. and Dennis L. Weisman, “The Telecommunications Act of 1996: The ‘Costs’ of Managed Competition,” Kluwer Academic Publishers, 2000.
- Pirrong, S, Craig, “Political Rhetoric and Stock Price Volatility: A Case Study,” Catalyst Institute Research Project, University of Michigan, November 1993.
- Prieger, James E., “Telecommunications Regulation and New Services: a Case Study at the State Level,” University of California, Davis, Working Paper, March 29, 2001. <http://www.econ.ucdavis.edu/faculty/prieger/research.htm>
- Prieger, James E. “Regulation, Innovation, and the Introduction of New Telecommunications Services,” University of California, Davis, Working Paper, September 4, 2001. Forthcoming, *Review of Economics and Statistics*.
- Prieger, James E., “The Supply Side of the Digital Divide: Is there Redlining in the Broadband Internet Access Market,” University of California, Davis, Working Paper, September 13, 2001. <http://www.econ.ucdavis.edu/faculty/prieger/research.htm>
- Schwartz, Marius, “The Economic Logic of Conditioning Bell Entry into Long Distance on the Prior Opening of Local Markets,” AEI-Brookings Joint Center for Regulatory Studies Working Paper No.00-4, April 2000. http://www.aei.brookings.org/publications/working/working_00_04.pdf
- Taylor, William E., Charles J. Zarkadas and J. Douglas Zona, “Incentive Regulation and the Diffusion of New Technology in Telecommunications,” NERA Memo, 1992.
- Thierer, Adam (2001). “Broadband and the Markets: Perspectives from the Investment Community,” Cato Institute Policy Forum, July 24, 2001, <http://www.cato.org/events/010724pf.html>.
- Thorne, John, “The 1996 Telecom Act: What Went Wrong and Protecting the Broadband Rollout,” Verizon, September 2001.

Table 1. Financial reactions to “open access” events (Jan 1998 – Oct 2000). Returns calculated net of S&P 500 returns.

Twenty-one events signaling setbacks for “open access”

	Internet Index		Excite@Home	
	One-day	Three-day	One-day	Three-day
Mean	1.1%	1.7%	7.6%	8.1%
Median	0.7%	2.4%	8.0%	8.2%
Cumulative	24.6%	41.6%	364.2%	408.6%

Eight events signaling victories for “open access”

	Internet Index		Excite@Home	
	One-day	Three-day	One-day	Three-day
Mean	-0.1%	-0.1%	-4.9%	-6.4%
Median	0.3%	0.0%	-4.0%	-6.5%
Cumulative	-1.0%	-1.0%	-33.2%	-41.0%

Table 2. Abnormal returns during Tauzin-Dingell Events, April 1999 – June 2001. Three day windows; CLEC returns adjusted by Nasdaq, ILEC returns by S&P 500.

	All CLECs	UCLECs	FCLECs	ILECs
All 16 days	1.7%	1.2%	2.4%*	-0.8%
12 positive days	1.4%	1.2%	2.0%	-1.1%
4 negative days	1.6%	1.1%	2.4%	-0.8%

* Significant at the 95% level (two-tail test).

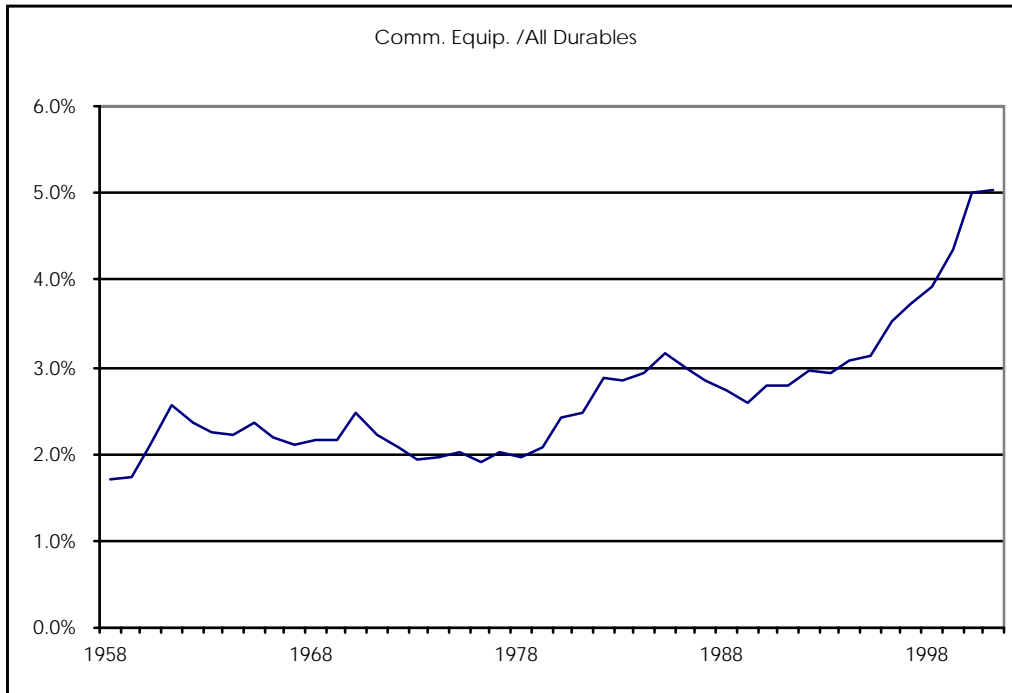
Table 3. Sector stock price changes around Sec. 271 developments.
Three-day abnormal returns. Absolute value of the t-statistic is in parentheses.

Sec. 271 Developments	IXCs	Sprint and WorldCom	RBOCs	Internet	Semi-conductors	CLECs
Positive (n=45)	-0.76% (1.93)	-1.03% (2.28)	0.32% (0.30)	-0.07% (0.16)	0.08% (0.15)	-0.53% (0.63)
Negative (n=21)	0.84% (0.49)	2.90% (4.41)	1.07% (0.69)	-1.05% (1.60)	-0.42% (0.51)	-1.08% (0.50)

Table 4. Company Stock price changes around Sec. 271 developments.
Three-day abnormal returns. Absolute value of the t-statistic is in parentheses.

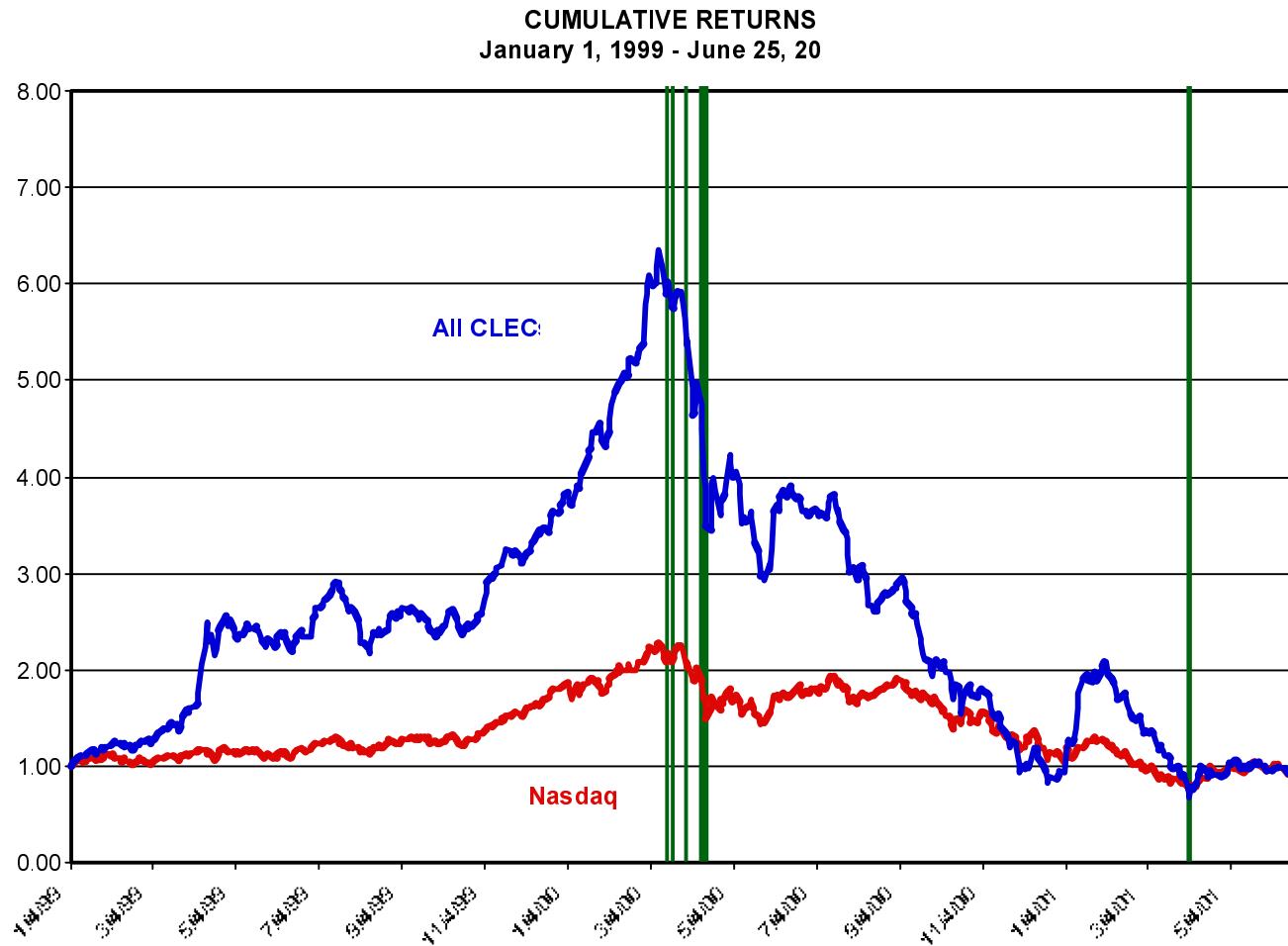
Sec. 271 Developments	AOL	At Home	Cisco	Level 3	Sun	Yahoo
Positive	-0.15% (0.21)	-1.87% (1.41)	0.00% (0.01)	0.42% (0.36)	0.00% (0.00)	-0.15% (0.15)
Negative	-0.04% (0.05)	-2.75% (1.37)	-2.08% (2.42)	-6.45% (3.23)	-1.92% (1.86)	0.29% (0.20)

Figure 1. Communications equipment sales as a fraction of all non-defense durable goods, 1958-2001.



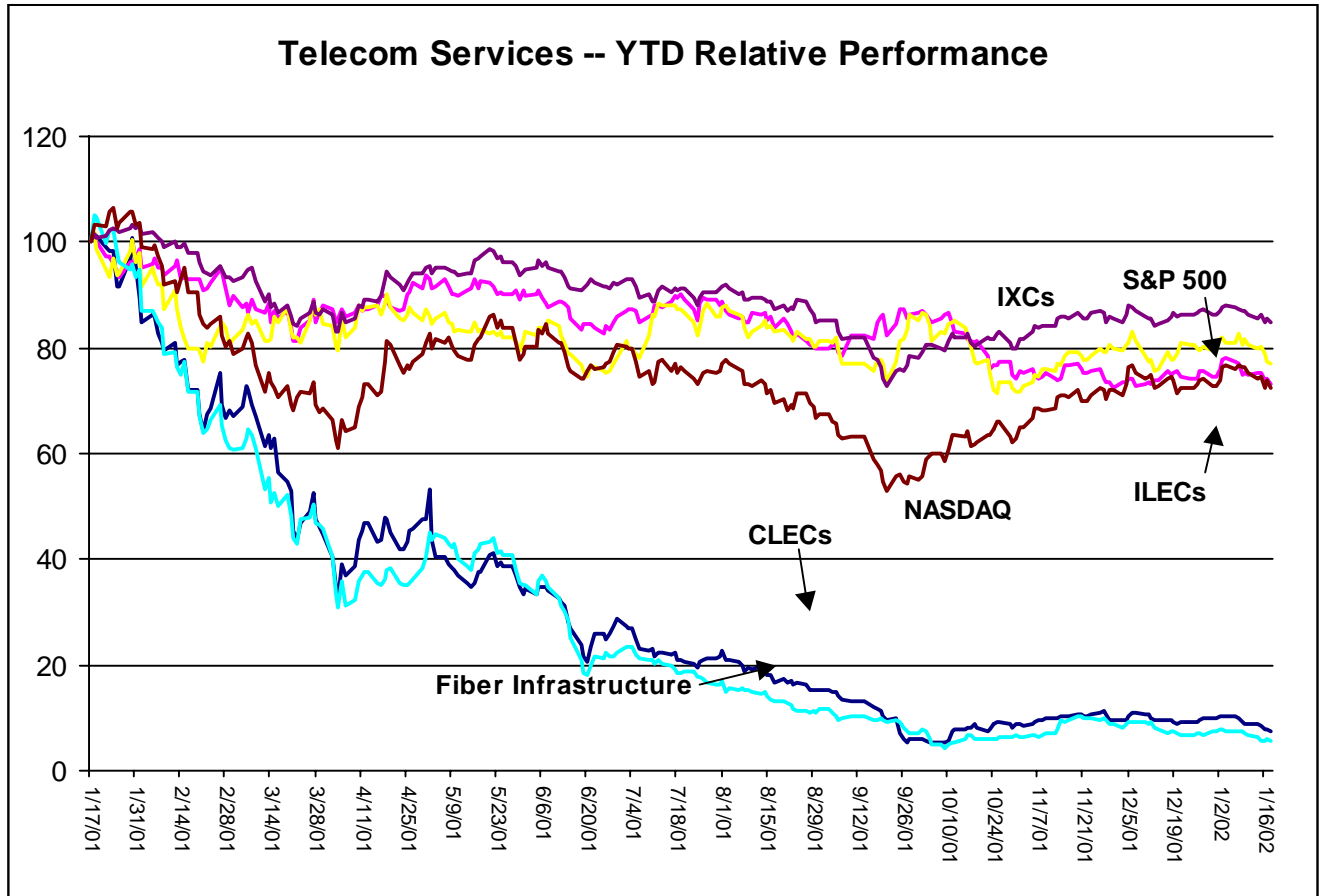
Source: <http://www.census.gov/indicator/www/m3/hist/naicshist.htm>.

Figure 2, CLEC returns with nine T-D “event” dates selected by Glassman-Lehr. 7 dates occur n March-April 2000; 2 in April 2001.



Note: All CLECs include: Adelphia, Allegiance, Choice One, Convergent, Corecomm, Covad, CTC Comm, Cypress, DSL.net, E.Spire, Focal, General Comm, ICG C Deltacom, Log On America, McLeod, Mpower, Net2000, Network Access, Northpoint, Ntelos, Pac-West, Rhythms, US LEC, USOL, XO Com, Advanced Radio, Allier Lightwave, Fibernet, Nucentrix, RCN Corp, Speedus, Teigent, Time Warner Telecom, and Winstar

Figure 3. Equity Returns in the U.S. Telecommunications Service Sector, 2001.



Source: Robertson Stephens - Telecom Services Research (January 18, 2002).

Fiber Infrastructure: Global Crossing, Metropolitan Fiber Networks, Genuity, Williams Communications Group, Level 3.

CLECs: Allegiance, Choice One, CTC, Network Plus, MacLeod, Time Warner Telecom.

ILECs: Century Tel, Broadwing, BellSouth, SBC, Qwest, Verizon, Commonwealth Tel.

IXCs: AT&T, Sprint FON Group, WorldCom Group, MCI Group.

Appendix. Sec. 271 Events and Predicted Effects on RBOCs.

Date	Event	Effect
Jun 26, 1997	FCC denies SBC application for Oklahoma	-
Jul 09, 1997	La. ALJ said BellSouth not ready to provide LD	-
Jul 24, 1997	BellSouth wins SC regulators' approval of competitive terms	+
Aug 06, 1997	BellSouth files for NC approval	+
Aug 19, 1997	Bells decry FCC [Michigan] Ameritech decision[includes TELRIC requirement]	-
Aug 20, 1997	La. Regulators vote to support BellSouth LD entry	+
Oct 21, 1997	SC PSC submits strong rec for SouthBell entry	+
Nov 03, 1997	Florida PSC rejects BellSouth's Sec. 271 application	-
Nov 04, 1997	DOJ recommends that FCC deny BellSouth's sec 271 application	-
Nov 06, 1997	Bell South files for La. LD entry	+
Nov 21, 1997	BellSouth to file 271 applications in three more state soon	+
Nov 26, 1997	La. PSC endorses BellSouth bid to offer LD in state	+
Dec 10, 1997	DOJ says FCC should deny BellSouth's La. LD bid	-
Dec 24, 1997	FCC denies BellSouth application in SC	-
Dec 31, 1997	Judge voids restriction on Bells – 1/2/98 event date	+
Jan 07, 1998	Tauzin: FCC should consider next 271 app "carefully"	+
Jan 14, 1998	NC gives BellSouth approval	+
Jan 15, 1998	NC regulators vote delays BellSouth bid for LD entry	-
Feb 04, 1998	FCC denies BellSouth La. LD application	-
Feb 11, 1998	Judge stays ruling on LD service	-
Feb 24, 1998	Arizona Filing	+
Apr 01, 1998	New York Filing	+
Sep 04, 1998	Appeals Ct. denies Bells entry into LD	-
Nov 19, 1998	KS denies SW Bell's in-state LD bid	-
Dec 22, 1998	US Ct.of Appeals decision against BellSouth doesn't bode well for similar SBC case	-
Jan 25, 1999	Sup Ct refuses to hear appeal by SBC, US West, BA	-
May 01, 1999	Massachusetts Filing	+
Sep 20, 1999	New York FCC Filing	+
Nov 01, 1999	Texas Filing	+
Dec 22, 1999	New York FCC Approval	+
Jan 10, 2000	Texas FCC Filing	+
Feb 14, 2000	US West plans mutlistate OSS 271 approval	+
Jun 30, 2000	Texas FCC Approval	+
Aug 01, 2000	Court upholds BA NY long distance	+
Sep 01, 2000	Kan. Says SBC meets 271 tests	+
Sep 22, 2000	Massachusetts FCC Filing	+
Sep 25, 2000	Qwest drops suits against states to ease 271 approvals	+
Oct 02, 2000	Kansas FCC Filing	+
Oct 26, 2000	Oklahoma FCC Filing	+
Oct 27, 2000	SBC asks for approval	+
Jan 22, 2001	Kansas FCC Approval	+
Jan 22, 2001	Oklahoma FCC Approval	+
Jan 29, 2001	Arkansas PSC recommends against 271 approval	-
Mar 09, 2001	Worldcom appeals KS, OK 271 approvals	-

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Apr 04, 2001	Missouri FCC filing (later dropped)	+
Apr 12, 2001	North Carolina Filing	+
Apr 17, 2001	Massachusetts FCC Approval	+
Apr 20, 2001	Louisiana Filing	+
Apr 23, 2001	Connecticut FCC Filing	+
Apr 23, 2001	Connecticut - Verizon seeks 271 approval	+
May 01, 2001	Michigan Filing	+
May 21, 2001	Whitacre says Cal is next target for SBC Sec.271 Entry	+
May 21, 2001	Massachusetts AG files appeal of Verizon's 271 approval	-
May 21, 2001	Ameritech making progress in Michigan	+
May 25, 2001	Alabama Filing	+
May 25, 2001	Kentucky Filing	+
May 25, 2001	South Carolina Filing	+
May 28, 2001	Connecticut - Verizon competitors oppose 271 approval	-
May 31, 2001	Florida Filing	+
May 31, 2001	Georgia Filing	+
Jun 01, 2001	Missouri - SBC misstatements surface	-
Jun 04, 2001	Avalanche of Bell Sec.271 applications expected	+
Jun 06, 2001	Pa. PUC gives Verizon tentative permission to offer LD	+
Jun 07, 2001	Missouri - SBC withdraws application	-
Jun 07, 2001	Pennsylvania PUC recommends 271 approval	+
Jun 08, 2001	Mississippi Filing	+
Jun 15, 2001	SBC admits to inaccuracies; FCC begins investigation	-
Jun 15, 2001	Ameritech meets 6 of 7 quality measurements	+
Jun 21, 2001	Pennsylvania FCC Filing	+
Jun 28, 2001	California Filing	+
Jul 01, 2001	Nevada	+
Jul 20, 2001	Connecticut FCC Approval	+
Jul 26, 2001	DOJ has concerns about Verizon's 271 petition for Pa	-
Jul 31, 2001	Tennessee Filing	+
Aug 03, 2001	Connecticut FCC approval	+
Aug 13, 2001	DOJ concerned about Verizon in Pa - no position on 271	-
Aug 20, 2001	Arkansas & Missouri FCC SBC filing	+

Sources: Legg Mason, Industry Update: Telecom & Media / Regulatory, July 24, 2001; Lexis-Nexis search.