REGULATION, INVESTMENT AND JOBS

HOW REGULATION OF WHOLESALE MARKETS CAN STIMULATE PRIVATE SECTOR BROADBAND INVESTMENT AND CREATE JOBS

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Executive Summary

REGULATION, INVESTMENT AND JOBS

At a time when the FCC and Congress are pulling out all the stops to promote investment in broadband, including providing billions of taxpayer dollars for broadband deployment, the FCC has the opportunity to advance its broadband agenda by revitalizing the telecommunications industry's economic engine -- *competition*. The RBOCs have long claimed that eliminating regulation and wholesaling requirements will incent investment by both ILECs and CLECs but the evidence to date supports and opposite conclusion. Decreased regulation has not yielded increased investments by ILECs or CLECs. By returning to policies that ensured that ILEC wholesale access facilities are ubiquitously available and fairly priced, the FCC has the opportunity to set in motion a new era of innovation, investment and job growth in the telecommunications industry. In this paper, we quantify the significant economic progress that we believe can be attained by restoring a competitively balanced regulatory regime, including stimulation of investment in high speed broadband infrastructure, industry-wide job creation, and greater productivity and employment across all sectors of the US economy.

Throughout this paper when we speak of returning to regulation we are not speaking about a return to the traditional rate of return- based regulation of the last century, but rather to broad regulations designed to ensure the most efficient use of the nation's existing and future network infrastructure. Using our construct, regulation will lead to increased competition and increased competition will lead to more investment and more jobs.

In a paper published last spring, *The Role of Regulation in a Competitive Environment*, we demonstrated that the "competition-friendly" regulatory policies in effect during the five years immediately following enactment of the *Telecommunications Act of 1996* spurred incumbents and competitors alike to invest or to expand their investments in telecommunications facilities. During that time, comprehensive unbundling requirements of the new Sections 251 and 252 of the 1996 *Act* along with relatively strict enforcement of the rate-constraining mandates of Sections 201 and 202 of the *Communications Act of 1934* ensured that competitors could purchase local transmission facilities as either UNEs or special access at relatively low and nondiscriminatory prices. The availability of reasonably priced local transmission facilities regulated in this manner enabled competitors to serve broad segments of the telecommunications market nationwide. We also showed that with the subsequent shift to a "competition unfriendly" regulatory regime – when the FCC dismantled many core protections that had been instituted so as to assure the availability and economic pricing of wholesale inputs – conditions became so unfavorable to investment by competitive carriers that entrants were compelled to dramatically scale back their capital spending and, in many cases, to withdraw from the market altogether.

Facing only limited remnants of the post 1996 Act competition, the ILECs' incentives to expand their own capital expenditures was diminished, and their investment outlays declined as well. Thus, while the combined net book value of telecom plant for AT&T, Qwest, and Verizon rose from $142-billion in 1996 to $155-billion in 2001, by 2007 it had dropped to only $101-billion.

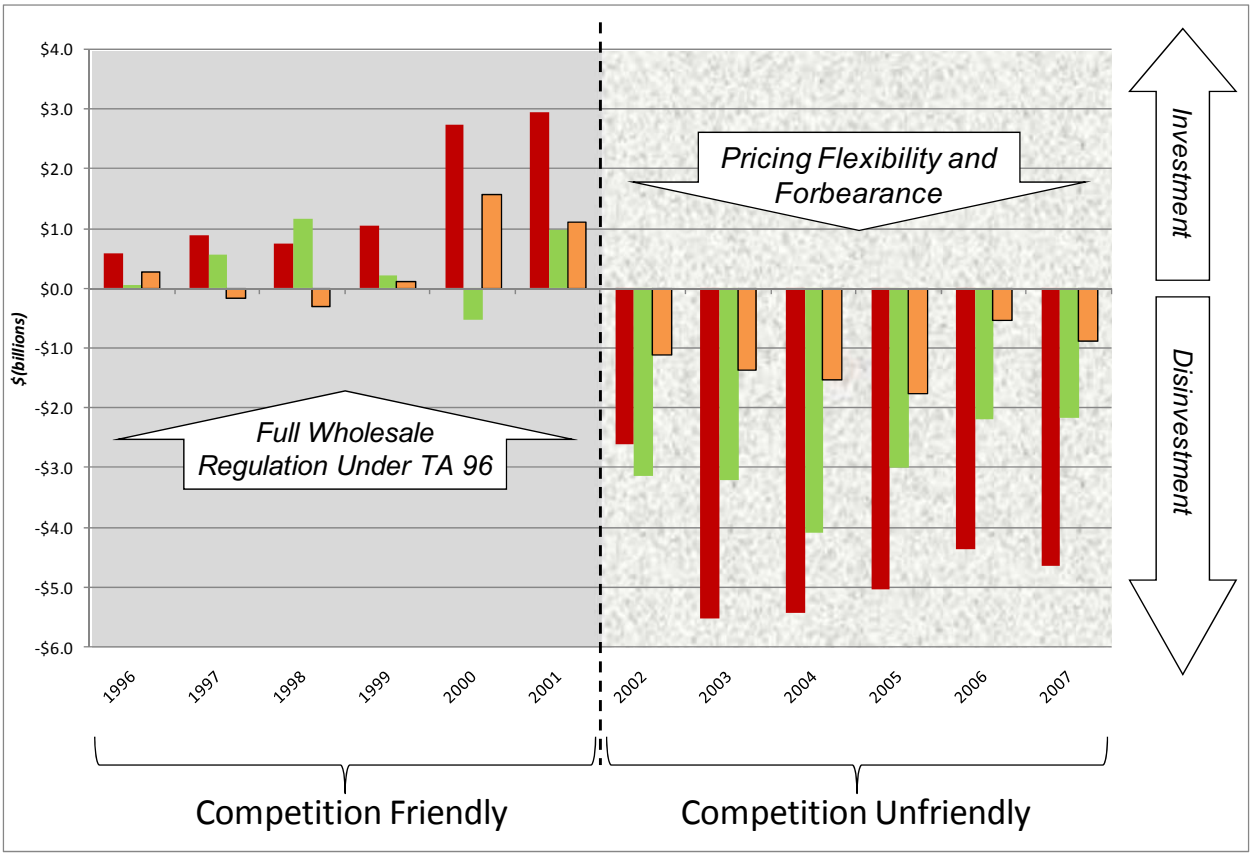

Figure ExecSum 1. RBOC net capital investments – 1996 to 2007 demonstrating that deregulation resulted in "disinvestment" rather than investment.

These same trends are also reflected in telecommunications sector employment. Telecom sector jobs grew steadily between 1996 and 2000. Although some employment losses in 2001-2002 could be attributed to general economic factors (in particular, the collapse of the "tech bubble"), jobs in the telecom sector failed to rebound even as conditions in the general economy improved. With "competition unfriendly" regulatory policies in place, the telecommunications sector has experienced steady and persistent job losses – a drop of more than 400,000 jobs, including the loss of 140,000 jobs at the regional Bell operating companies (RBOCs), between 2001 and 2007. The only segment of the telecommunications industry where employment increased was wireless where, during the relevant period, there had been four or more competitors in virtually every geographic market.

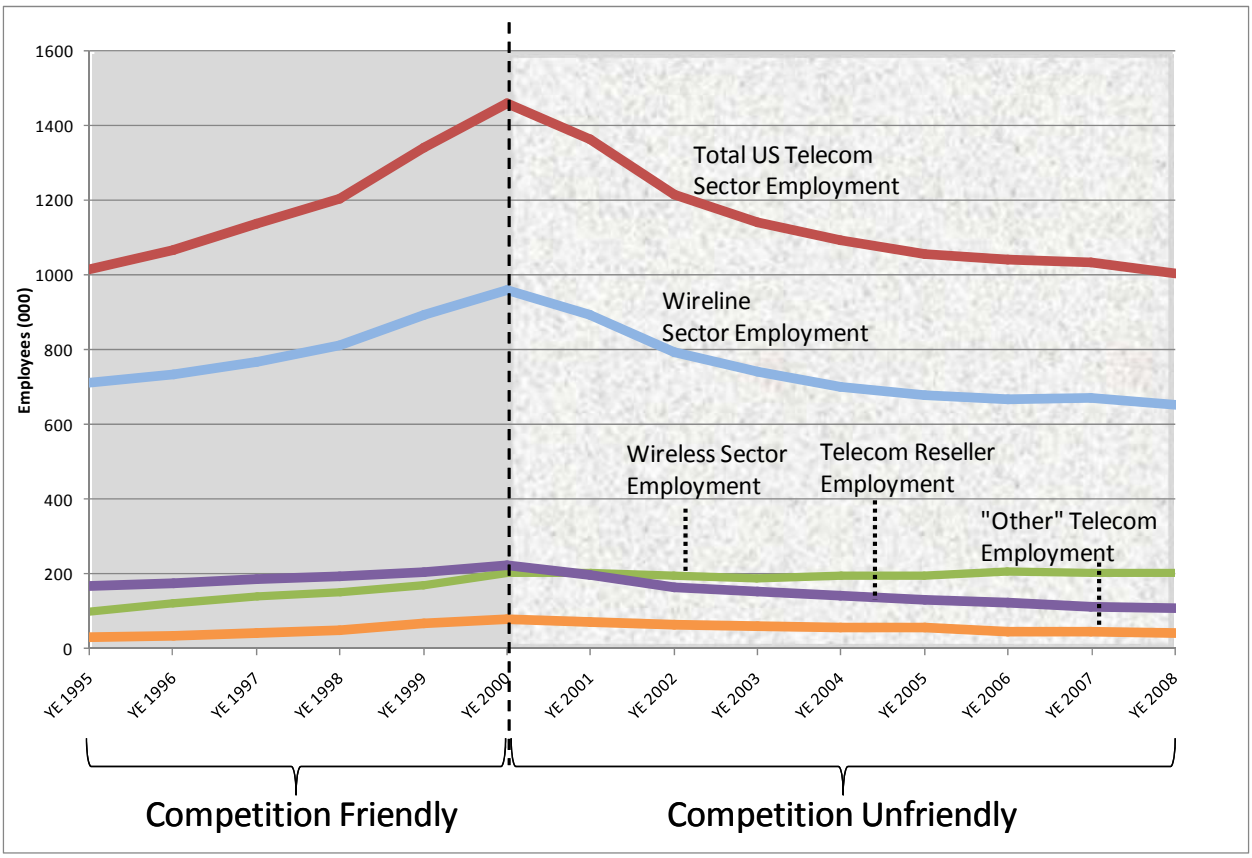

Figure ExecSum 2. Comparison of job changes overall in the US Telecom Sector to changes in the Wireline, Wireless, Reseller and "Other" telecom subsectors: 1995 – 2008.

Today's small and medium-sized business customers are eager for innovative, attractively priced services that permit them to take advantage of the latest voice and data applications over broadband platforms. In order to offer these services competitively, CLECs and their investors need to know that CLECs can purchase the particular high-capacity broadband access services demanded by business customers – including facilities that they can use efficiently to offer Ethernet and packetized data services – at rates that afford them a fair opportunity to compete with the incumbents at the retail level. But the existing regulatory regime operates to effectively foreclose competitor access to many of the underlying wholesale services required to effectively compete with the incumbents for retail Ethernet and packetized data services.

In this paper, we chart both the significant economic losses that have occurred since the FCC phased-out its "competition-friendly" regulatory structure and the significant economic gains in terms of investment and employment that we believe will be realized by restoring a

competition-friendly regulatory regime. These potential gains from a change in regulatory structure fall into several major categories:

- ***Stimulation of investment in high speed broadband infrastructure.*** Particularly infrastructure to serve business customer locations outside of the residential neighborhoods that have been the primary focus of ILEC and cableco investment. Looking out five years, we forecast year-over-year investment growth and cumulative investment dollars under three assumption sets of varying optimism and conservatism. With reimposition of effective wholesale regulation, we project that the cumulative investment by ILECs and CLECs will increase between $20-billion (under the most conservative assumptions) and $60-billion (under what we believe to be the most realistic scenario) by 2014, compared to the level of investment that can be expected to occur absent significant regulatory reform.

- ***Industry-wide job creation***. The economic expansion and additional competition resulting from restoring pro-competitive regulation for wholesale broadband services should lead to a large-scale growth in employment for ILECs and for CLECs, reversing the persistent job losses that occurred between 2001 and the present. As with our investment analysis, we forecast year-over-year job additions and cumulative job growth over a five-year period using three assumption sets. Even applying our most conservative assumptions, we forecast that there will be 135,000 more telecom sector jobs by 2014 if the FCC restores effective regulation to broadband wholesale services than if it accedes to a continuation of the current deregulatory regime. Under what we believe to be a more realistic assumption set, additional jobs in that sector over the same period could exceed 450,000.

- ***Stimulation of economy-wide economic growth and job creation.*** The adverse economic effects of stifling competition for the broad range of retail services that depend upon reasonably priced access to ILEC broadband network elements and special access services are not confined to the telecom industry itself. Conversely, the lower prices and innovative broadband offerings stemming from a more competitive telecom sector can be expected to flow through to the general economy, resulting in greater productivity and increased employment across all economic sectors. The inefficiency in the general economy as a result of special access overpricing has been compounding for close to a decade. Building off of well-regarded economic modeling tools used by AT&T itself in the past we estimate that through 2009 forgone GDP growth has been in the range of $66-billion, and that the general economy (excluding telecom) could have supported 234,000 more jobs had the economic benefits of competitive special access pricing been flowed to businesses economywide.

Restoring access to reasonably priced ILEC wholesale broadband facilities should stimulate private sector broadband investment going forward, expanding telecommunications

sector employment, and generating widespread gains across the entire US economy. At a time when both economic growth and the availability of high-quality, affordable broadband services are compelling national priorities, the FCC has an important opportunity to advance both goals with the same regulatory reforms.

TABLE OF CONTENTS

1.2: RBOC net capital investments – 1996 to 2007 demonstrating that deregulation resulted in "disinvestment" rather than investment

1.3: Comparison of ILEC and CLEC capital expenditures demonstrates that deregulation does not spur investment – 1996 – 2007.

1.4: Comparison of ILEC, non-cable CLEC and cable company capital expenditures 1996 – 2008.

1.5: Telecom Sector job losses 2001 to present

1.6: Indexed changes in US telecom sector employment compared to total US non-farm employment: 1995 – 2008

1.7: Almost 150,000 BOC jobs have been lost since year end 2000.

1.8: Changes in numbers of RBOC employees compared to changes in numbers on nonRBOC wireline telecom employees: 1995 – 2008

1.9: Comparison of job changes overall in the US Telecom Sector to changes in the Wireline, Wireless, Reseller and "Other" telecom subsectors: 19995 – 2008.

1.10: Indexed comparison of employment trends in the US Telecom Sector to changes in the Wireline, Wireless, Reseller and "Other" telecom subsectors: 19995 – 2008.

1.11: Job losses across US Telecom sectors during the "competition unfriendly" period: 2001 – 2008.

2.1: Projected increases in US telecom investment by ILECs and CLECs through 2014 resulting from a re-instatement of wholesale service regulations

2.2: Projected increases in US telecom sector employment through 2014 resulting from a re-instatement of wholesale service regulations

1 COMPETITOR ACCESS TO WHOLESALE LAST MILE FACILITIES CREATED TELECOM INVESTMENT AND JOBS

This paper examines the effect of comprehensive FCC regulation of ILEC wholesale loop offerings upon telecommunications investment and employment and upon the US economy overall. It does so by analyzing the relationship between past FCC regulation and deregulation of ILEC wholesale loops and investment/job levels and by forecasting future effects that we would expect to arise from the reinstatement of regulation of wholesale services. The study concludes that on the basis of the available evidence deregulation has not yielded increased investment by ILECs or CLECs. Comprehensive regulation of the rates charged by ILECs for current loop technologies yielded higher levels of investment in loop plant by competitors and by incumbents as well in the past and should be expected to do so in the future. The report also shows that such increased investment, in turn, can be expected to result in significant economic gains and job creation, both within the telecom sector and across the US economy overall.

Noted economist George Stigler wrote that "the basic role of the scientist in public policy, therefore, is that of establishing the costs and benefits of alternative institutional arrangements."[1] As policymakers prepare to embark upon 'alternative institutional arrangements' to facilitate broadband investment in particular and to stimulate the US economy more generally, it is prudent to step back and evaluate the 'costs' and 'benefits' that can be observed to have flowed from the virtual elimination of all regulatory safeguards on the provisioning and availability of last mile broadband facilities on a wholesale basis.[2] It is equally important to consider whether a change in those policies would bring about a different outcome.

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[1] Stigler. "The Economist and the State" *American Economic Review*, 1963.

[2] Throughout this paper we are reporting *correlations* between regulatory activity and levels of investments and jobs. The limited data available would make attempts at determining statistical *causality* based strictly upon the data, as opposed to industry knowledge, difficult if not impossible. Any assumptions of *causality* found herein are those arrived at by the authors based upon the observed *correlations* and decades of experience observing and analyzing the behavior of carriers operating in the telecommunications environment.

ILECs appear to retain effective monopoly control of many "last mile" facilities, and use these assets to compete in the same downstream markets as the ILECs' wholesale customers.[3] By escalating their wholesale rates to uneconomic levels, or by denying outright their rivals' access to such facilities, the ILECs can limit competitive inroads in such downstream markets and/or force downstream retail prices above competitive market levels. The 1984 consent decree that broke up the former Bell System[4] sought to address this concern by foreclosing incumbent Bell Operating Company (BOC) access to many downstream markets where their control of the underlying "last mile" facilities could afford them an unfair competitive edge. The 1996 federal Telecommunications Act replaced these outright BOC "line of business" entry restrictions with a series of regulatory measures that were intended to achieve the same overall result while still permitting the BOCs to compete downstream.

In an earlier paper, *The Role of Regulation in a Competitive Environment*, we explained that the thirteen years since the 1996 Telecom Act can be divided into two distinct regulatory policy regimes. TA96 strongly encouraged the development of competition and did not attempt to second-guess competitors' business judgments as to the viability of business models reliant to varying degrees upon the use of incumbent facilities vs. competitor-owned facilities-based investments.[5] The FCC initially adopted a framework that supported this policy that, while encouraging facilities-based entry, was also aimed at encouraging expansive competitive activity that could only arise if incumbent carrier facilities could also be utilized.[6] When TA96 was enacted and for several years thereafter, the FCC also maintained full oversight of ILEC rates across the full range of local transmission facilities, pursuant to network unbundling and legacy special access regulation.

From the very start, however, the large ILECs challenged the TA96 unbundling requirements and continued regulation of special access services. They claimed that mandated wholesale access and price regulation created disincentives to investment by both competitors and incumbents. These claims turned out to be entirely without merit – as the analysis that

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[3] Effective monopoly conditions remain particularly in the market for "last mile" business class services. While successful competitive inroads have been made for "last mile" services for many mass market customers (primarily through cable company and wireless entry into those markets) the same cannot be said for the non-mass-market services.

[4] United States v. AT&T, 552 F. Supp. 131 (D.D.C. 1982), aff'd sub nom. Maryland v. United States, 460 U.S. 1001, 103 S. Ct. 1240, 75 L. Ed. 2d 472 (1983).

[5] Facilities-based entry was not the exclusive vision of the 1996 US Telecommunications Act, and for good reason. Congress understood that in order to compete effectively using what are necessarily far less extensive networks than those that had been developed by incumbent carriers operating for nearly a century as government-protected monopolies, competitors require the ability to use incumbent carrier network facilities at cost-based wholesale rates in combination with the competitors' own facilities. The elimination of the requirement that incumbents offer wholesale local services at cost-based rates has caused the largest US telecommunications competitors to fail and has raised the barriers to entry and expansion for the few competitors that have, for the moment, survived.

[6] Appendix A to this report contains a brief tutorial summarizing the competitive entry paths envisioned in TA-96.

follows shows, more investment – both by CLECs and by ILECs – actually took place under regulation that encouraged competition than after its removal. Nonetheless, the large ILECs' efforts were ultimately successful such that roughly ten years ago the FCC began largely abandoning its wholesale access and pricing mandates and replacing them with various forms of deregulation.[7] For purposes of discussion throughout the remainder of this paper, we will refer to the pre-2001 period as the "competition-friendly" regulatory regime and the post-2001 period as the "competition-unfriendly" regime.[8] The nature of investment data reporting (done on a year-end basis) forces references to specific years as if a change occurred on a single date when in fact changes in direction likely occurred over a series of months spanning both sides of the reporting date.

A series of major federal actions leading up to and including those occurring during the 2001 timeframe and beyond led those attempting to compete with the BOCs to realize that premising a business plan upon leasing BOC wholesale facilities to serve broad segments of the telecommunications market, including small and medium enterprise customers, was no longer a prudent proposition.[9] Importantly, it also marks the time when the BOCs would have begun to

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[7] Details in RoR paper at 18 - 20.

[8] Some have objected to this analysis, arguing that no fundamental shift in regulatory policy occurred in 2001 and that the fall-off in investment can be attributed to general economic conditions, including the collapse of the so-called 'tech bubble.' These critics' timing argument is primarily a quibble about the exact dates of particular FCC orders, but it does not rebut the fundamental conclusion that, by 2001, the handwriting was on the wall: The FCC was committed to retreating from regulation of RBOC wholesale access services. The fact that the 'tech bubble' had burst at roughly the same time may or may not have been coincidental and may well have been exacerbated by FCC actions whose effect was to discourage competitive investment in new telecom ventures. In any event, whether the competitive telecommunications providers' reversal of fortunes (including numerous bankruptcies) played a significant role in causing the tech bubble to collapse or whether the crash simply exacerbated the CLECs' financial difficulties does not alter our conclusion about the impact of the fundamental regulatory shift that by 2001 had become all too apparent.

[9] As an example, the FCC initially approved a pricing flexibility plan for special access services in late 1999, and although several parties, including ILEC competitors, had argued during that proceeding that the FCC's proposed rules would allow the ILECs to exercise their market power to disadvantage their competitors, proof that the FCC's predictive capabilities were wrong took some time to appear. (See, *In the Matter of Access Charge Reform; Price Cap Performance Review for Local Exchange Carriers; Interexchange Carrier Purchases of Switched Access Services Offered by Competitive Local Exchange Carriers; Petition of U S West Communications, Inc. for Forbearance from Regulation as a Dominant Carrier in the Phoenix, Arizona MSA*, CC Docket No.96-262; CC Docket No. 94-1; CCB/CPD File No. 98-63; CC Docket No. 98-157, *Fifth Report and Order and Further Notice of Proposed Rulemaking*,14 FCC Rcd 14221(1999)) In 2000 the first markets were granted pricing flexibility. By 2001 it had become clear to both customers and competitors that the ILECs were abusing their significant market power and that rather than lowering prices to meet competition (as the FCC had anticipated) pricing flexibility was being used to increase prices on high capacity facilities that competitors needed to integrate with their own facilities in order to offer services. (*See, e.g.*, Comments of AdHoc Telecommunications Users Committee (Jan. 22, 2002) at 2-3, filed in *Performance Measurements and Standards for Interstate Special Access Services*, CC Docket Nos. 01-321, 00-51, 98-147, 96-98, 98-141, 96-149, 00-229, Notice of Proposed Rulemaking, 16 FCC Rcd 20896 (2001) and *AT&T Corp. Petition for Rulemaking To Reform Regulation of Incumbent Local Exchange Carrier Rates For*

understand that they had successfully maneuvered their way out of the regulatory mandates that would, over time, have subjected them to competition for business broadband services.

Recognizing the linkage between strong wholesale regulation and carrier willingness to invest in network facilities and to create jobs.

The present policy focus upon "high-speed ubiquitous broadband" has as its underpinning a concern with ensuring overall US economic health and stimulating employment opportunities for US citizens. Building upon our earlier analysis linking investment outcomes under "competition-friendly" and "competition-unfriendly" policy regimes, in this paper we also demonstrate a linkage between those regulatory regimes and employment in the telecom sector. By quantifying the investment dollars and jobs lost after CLECs were cut off from a dependable source of wholesale last mile broadband facilities, it can be seen that the economic 'benefits' that the ILECs claimed would occur did not, rather there was a 'cost' associated with deregulating ILEC wholesale services that can be identified. The RBOCs, of course, have repeatedly argued (without any quantification or other hard evidence) that requiring them to continue to lease facilities to competitors would actually chill investment – and that contention did have some superficial appeal. However, upon closer analysis, it is apparent that there is no economic or other quantitative support for this argument. If the TA96 wholesale services requirements had worked to dampen RBOC investment incentives as these companies continue to assert, then the removal of these requirements should have produced a large-scale increase in RBOC investment levels. In fact, the exact opposite occurred. Moreover, the investment data also fail to support the RBOCs' claim that, by allowing CLECs to purchase wholesale last mile facilities at regulated price levels, CLECs would not "build" their own as long as they could "buy" what they needed from the ILECs. So removal of the post-TA96 wholesale service regulation should also have worked to stimulate additional CLEC capital spending. As it has turned out, neither ILEC nor CLEC investment levels experienced the predicted growth once the dismantling of wholesale regulations had been implemented.

In many ways, these outcomes should not be surprising. As with any other business, ILECs and CLECs will invest in new technologies (in this case, rolling out business broadband) and hire or retain employees only where there is a business case to support such an investment – i.e., increased revenue opportunities, response to competition, and/or improved operational efficiencies. Capital will flow in response to *bona fide* economic opportunities, such as those created and fostered by a robustly competitive market. Choking off potential competition not only works to foreclose investment opportunities for entrants, it also operates to eliminate the urgency of competitive responses on the part of the incumbents, enabling them to defer

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Interstate Special Access Services, RM Docket No. 10593, *Petition for Rulemaking of AT&T Corp*., filed October 15, 2002.AT&T initial complaint.) Later "competitor unfriendly" actions by the courts and the FCC served to exacerbate the problem – fueling further reductions in investment levels and jobs in the telecom sector.

investments as well.[10] Assuming arguendo that regulation might tend to reduce incentives for ILECs to invest (and there is no reason to expect that it would), there is every reason to expect that the effect of regulation may be relatively small in comparison to other business factors that a carrier considers when trying to determine whether to invest. Where that is the case, eliminating regulation should not be expected to cause an increase in investment by ILECs – particularly if the elimination of wholesale regulation has a dampening effect on the ability of other carriers to compete with the ILEC. At the same time, retaining or re-imposing regulation might well be a necessary precondition for some CLEC investment.[11] Where this is the case, eliminating regulation should be expected to lead to a decrease in CLEC investment.

The question that should have been raised by the ILECs' deregulatory push that began during the late 1990's and continues on today was whether the elimination of the regulatory structure that was in place following the 1996 Act[12] would improve the business climate for ILEC and/or CLEC investment. The ILECs' argument that deregulation will spur investment rests upon the assumption that when a carrier (ILEC or CLEC) is considering whether to make an investment in facilities, the 'cost' of regulation (in their view, the ILECs' inability to reap all of the benefits of an investment in new technologies or facilities and the CLECs' ability to get a "free ride") will tip the balance on some investment decisions to the negative side. Yet even posing this type of entirely intuitive hypothesis implicitly suggests that any regulation is, *per se*, a bad thing. There is, however, no empirical evidence that regulation chills investment.

The abrupt change in the "rules of the game" that occurred after 2001 catalyzed the withdrawal of investment capital from competitive ventures, and by eliminating much of the competitive challenge that had emerged, enabled the ILECs actually to *disinvest* in their networks, not even replacing worn-out plant as quickly as it was being retired.[13] Contentions

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[10] Sprint backed up its entry into the long distance market in the 1980s by undertaking the construction of an ambitious nationwide fiber optic network, promoting its exceptionally high quality ("you can hear a pin drop") relative to AT&T's network, which retained legacy microwave and coaxial cable transport components. Sprint's competitive challenge compelled AT&T to advance its own fiber optic investment plans by several years. (*See* "Sprint unrolling bright future with fiber optics" *Chicago Tribune,* May 19, 1987) Competition, not complacency, is the key driver of new capital investment.

[11] The market for last-mile telecommunications services differs from many other product markets in that the service being provided is a component in a *network*. The relationship of the 'network effect' to CLEC requirements for generally available wholesale services to complete their owned network facilities is discussed in an earlier ETI paper *The Non-Duplicability of Wholesale Ethernet Services: Promoting Competition in the Face of the Incumbent's Dominance over Last Mile Facilities*, prepared for MTS Allstream, Inc., March, 2009.

[12] Including pre-existing Section 201 and 202 requirements that pre-dated the 1996 Act.

[13] Unlike rate of return based regulatory schemes that encouraged carrier investment – resulting in what was frequently described as the 'gold-plated network' -- the current iteration of the FCC's price caps regime (with no upper earnings limit or sharing requirement) rewards ILECs for not investing in their networks by allowing them to reap ever higher levels of profit. In a competitive market, carriers would find it necessary to continue to invest in order to maintain or improve service and introduce new options. The FCC dismantling of its wholesale regulatory

regarding the "cost of regulation" have, in the end, been mainly rhetorical, certainly not empirical. The ILECs' position fails to consider any of the economic benefits of regulation – benefits that include, among other things, making the most efficient use of existing economic assets rather than duplicating them for nothing more than the sake of duplication, jump-starting broad-based competition far more quickly than could have been achieved had all entrants been forced to overbuild all existing incumbent networks, encouraging innovation rather than complacency, and the like.[14]

This cost/benefit calculation must be made at two levels – at a microeconomic level (i.e., by each business entity as part of its capital budgeting and investment process) and at a macroeconomic level (by policymakers evaluating the economic merits of alternative regulatory policies). Firms will invest where, from their perspective, such investments will yield a positive return. An entrant will choose to build facilities rather than to purchase wholesale services from the incumbent where (a) this approach is less expensive than buying wholesale services from the incumbent, *and* (b) the investment can be expected to produce a positive return. By overpricing wholesale services, the incumbent can discourage entrants' use of wholesale services, but if the entrant's cost of acquiring its own facilities is so high that the venture cannot be profitable, the investment will not be made. The incumbents thus focus their policy argument entirely upon (a) and entirely ignore (b). But the empirical evidence of wide scale reductions in telecom investment on the part of both entrants and incumbents following the elimination of price regulation of wholesale services seems to resolve the cost/benefit debate supporting the following conclusion: it was the elimination of regulation, not its imposition, that engendered costs at both the firm (microeconomic) and societal (macroeconomic) levels. Policymakers do not have it within their control to increase revenue opportunities or improve operational efficiencies – but they do have the authority and tools to increase the overall level of competition for broadband facilities.

Limitations on wholesale use of ILEC facilities was accompanied by a reduction in overall investment levels.

Despite having achieved virtually all of their deregulatory goals, the RBOCs' investment levels since 2001 do not represent anything extraordinary or particularly risky. Analysis of historic data both for ILECs and for CLECs demonstrates a reduction in overall investment levels as opportunities for use of ILEC facilities by competitors became increasingly limited (either through outright elimination of purchase options or overpricing of services that have

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requirements combined with the present price caps regulatory regime dramatically reduced ILEC investment incentives.

[14] Carrier decisions to commit capital dollars also ignore societal benefits (more competition, lower prices, innovation, and stimulation of demand) but one would not expect those elements to be considered by an individual corporation during its capital planning process.

remained available). As the data in Figure 1-1 below demonstrate, recent years' RBOC wireline network investments have actually been less than in the past, and their capital investment has actually slowed as regulation has decreased.

The RBOCs today are only investing about half as much in their networks as they were at the start of this decade. Looking back over the period from 1996 through the end of 2007 (the most recent year for which financial data is available), RBOC capital investments peaked in the 2000-2001 time frame at approximately $30-billion per year, and dropped off significantly after that. Total capital investments made during 2006 and 2007 was almost half of that amount – approximately $17.5-billion per year.

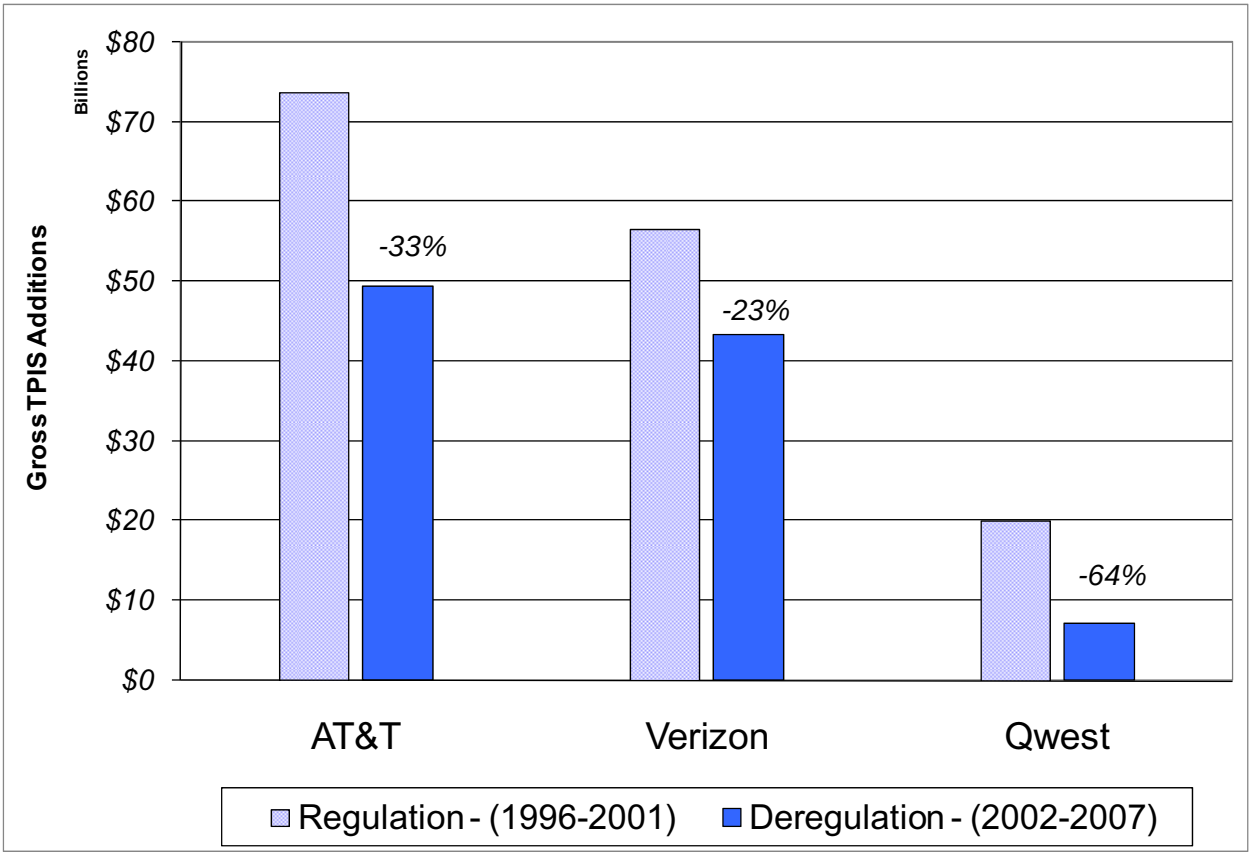

Figure 1- 1 Comparison of RBOC capital expenditures (Gross Plant Additions) made during the "competition friendly" (1996 to 2001) and "competition unfriendly" (2002 to 2007) periods.

In fact, as shown in Figure 1-2 below, in each of the years since 2001, the largest local carriers in the US have *disinvested* in their networks – with the result that the net book value of plant in place at the end of 2007 is *less* than it was in 2001, and even less than it had been in 1996 when the Act was passed. Network *disinvestment* occurs when the depreciation charge in

any given year is greater than the amount of new capital investment. The combined net book value of telecom plant for the companies that now are part of AT&T, Qwest and Verizon rose from $142-billion in 1996 to $155-billion in 2001, but by 2007 it had dropped by a third, to $101-billion.[15]

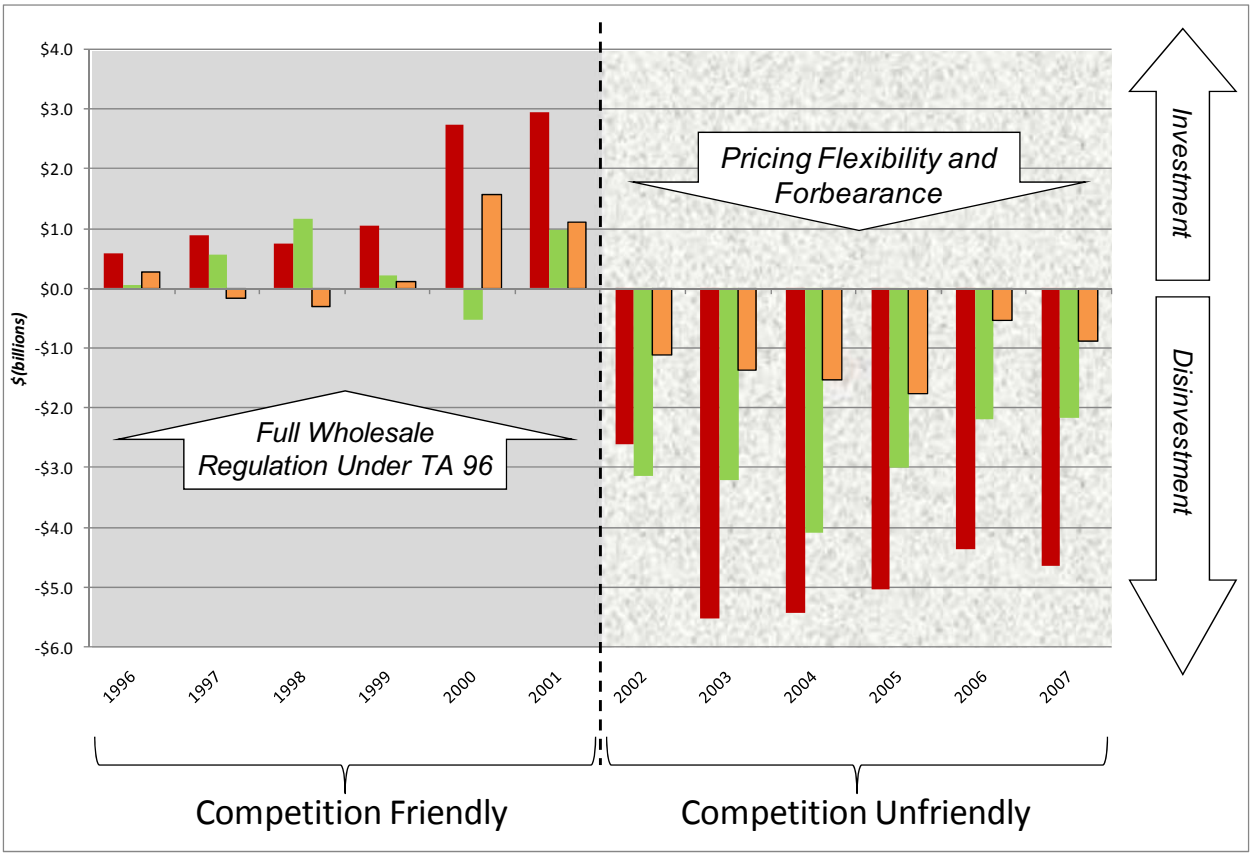

Figure 1- 2 RBOC net capital investments – 1996 to 2007 demonstrating that deregulation resulted in "disinvestment" rather than investment.

From the perspective of business customers, the magnitude of recent RBOC broadband investments is even less impressive than the aggregate investment data would suggest. Recent RBOC broadband investments have targeted residential rather than enterprise or small business customers and services. Even residential investment initiatives have been more targeted than

[15] FCC, ARMIS Report 43-02, USOA Report: Table B-1.B, Years ending 1996-2007; ARMIS Report 43-02, USOA Report: Table B-5, Years ending 1996-2007. Available at http://www.fcc.gov/wcb/eafs (accessed March 4, 2009).

ubiquitous.[16] Although there has been extensive press coverage of Verizon's FiOS and AT&T's U-*verse* rollouts, actual investment is unimpressive.

A carrier-by-carrier review of the RBOCs capital expenditures during the period 1996 (passage of the Act) to 2007 (last year for which RBOC investment data is available) reveals the regulation/investment linkage we discuss throughout the rest of this paper.

- ***Verizon:*** During the "competition friendly" regime (1996 to 2001) while regulation of wholesale services was still in effect, Verizon increased its gross Telephone Plant in Service ("TPIS") by $56.5-billion. For the subsequent six-year period (2002-2007) – the "competition unfriendly" period – Verizon's gross TPIS additions were substantially lower – at $39.8-billion. *Verizon spent 42% more on telecommunications plant during the six year period during which regulation of wholesale rates was in effect than during the subsequent six year period of deregulation.*[17] That means that even including its highly publicized *FiOS* investment – Verizon's foray into fiber-to-the-home and the TV market – Verizon spent about 30% less than it had been spending while subject to price regulation.

  While it is not possible to definitively isolate Verizon's capital investments in the residential market (where it is racing to compete with cable TV companies for the "triple-play" phone/Internet/video bundle) from its capital investments in enterprise service broadband facilities – there is considerable evidence that the bulk of its recent capital spending has been directed mainly at the residential markets – not at business broadband. Verizon began investing in *FiOS* in 2004, and projected that it would spend approximately $23-billion by the end of 2010.[18.] According to data filed with the FCC, Verizon's ILEC operations invested a total of $25.8-billion in Verizon's entire network over the first four years of that 7-year deployment period (compared to single-year network investments of $30-billion for each of 2000 and 2001), and $11.2-billion of that was investment was in Cable and Wire Facilities (CWF). The CWF category contains both the last mile transport facilities being upgraded for residential *FiOS*, last mile

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[16] As the recent research report released by the Berkman Center at Harvard University concludes, the quasi-competitive conditions that exist in the market for consumer broadband services in large parts of the US are the result of the unique circumstances that enabled cable companies to utilize last-mile plant originally deployed for video transmission. (*See*, The Berkman Center for Internet & Society at Harvard University, *Next Generation Connectivity: A review of broadband Internet transitions and policy from around the world*, October 2009 (Draft), at 12). Notably absent from the consumer market are other broadband competitors – facilities based or otherwise. The broadband investment that the RBOCs have made in the mass market come largely from efforts to compete with the cable companies, and has occurred primarily – if not entirely – in areas where cable company competition exists.

[17] The data includes Verizon's predecessor ILEC companies: Bell Atlantic and non-RBOC GTE.

[18] *Verizon Provides New Financial and Operational Details on its Fiber Network as Deployment Gains Momentum*, Verizon Investor Relations, "News-at-a-glance", September 27, 2006.

business special access facilities, and interoffice transport facilities. Since Verizon reported to its investors that $8- to $10-billion or more of that was for *FiOS*, only about $2-billion (or $500-million per year) is left for all other interoffice transport and enterprise and wholesale last mile facilities combined. This $0.5-billion per year is considerably less than Verizon had been spending on (non-*FiOS*) CWF facilities for the preceding period (for purposes of our analysis – 1996 to 2003) during which Verizon's annual CWF plant additions averaged $2.4-billion.

- ***AT&T Inc.:*** During the same 1996-2001 "competition friendly" period, the RBOCs that now comprise AT&T Inc. increased their total TPIS by $73.7-billion. For the subsequent six-year period 2002-2007, AT&T Inc.'s (and its legacy RBOCs') TPIS additions were, like Verizon's, substantially lower – at $49.4-billion. Facing the same regulatory environment as Verizon, AT&T Inc.'s investment patterns were similar – spending almost 50% more on telecom plant during the six years when price and regulation and wholesale requirements were in effect than over the subsequent six-year period of deregulation.[19] *That means that even including its mass-market U-verse Internet and video deployment, AT&T Inc. spent about one-third less during the post-regulation time frame than when wholesale services prices and access were still being regulated.*

- ***Qwest:*** The drop-off in Qwest's gross capital additions to its network is even more striking than either Verizon's or AT&T's. For the "competition friendly" 1996-2001 period, Qwest increased its gross TPIS by $20-billion. But in the 2002-2007 "competition unfriendly" regime under pricing flexibility and other deregulatory measures that Qwest had actively sought, the Company's gross TPIS additions had dropped by almost two-thirds, to a little over $7-billion for the entire six years. *Qwest spent almost three times as much on telecommunications plant during the six year period when wholesale regulation was in effect than the subsequent six years when most of its wholesale services and rates had been deregulated.*

CLEC investment followed similar trends, increasing during the period when regulation ensured the availability of cost-based wholesale inputs and falling off once it was clear that regulators were no longer committed to ensuring the availability of these key components of most CLECs' business models. Not only did the unavailability of wholesale inputs fail to spur CLECs to 'build' instead of 'buy;' it actually caused many CLECs to exit the market. Figure 1-3 below compares the growth of ILEC and competitor capital expenditures in the high-regulation

[19] The data includes AT&T's predecessor ILEC companies: SBC, SNET, Ameritech, Pacific Bell and BellSouth.

period immediately after the 1996 legislation, followed by a significant contraction of investment under the post-2001 FCC deregulatory regime. [20]

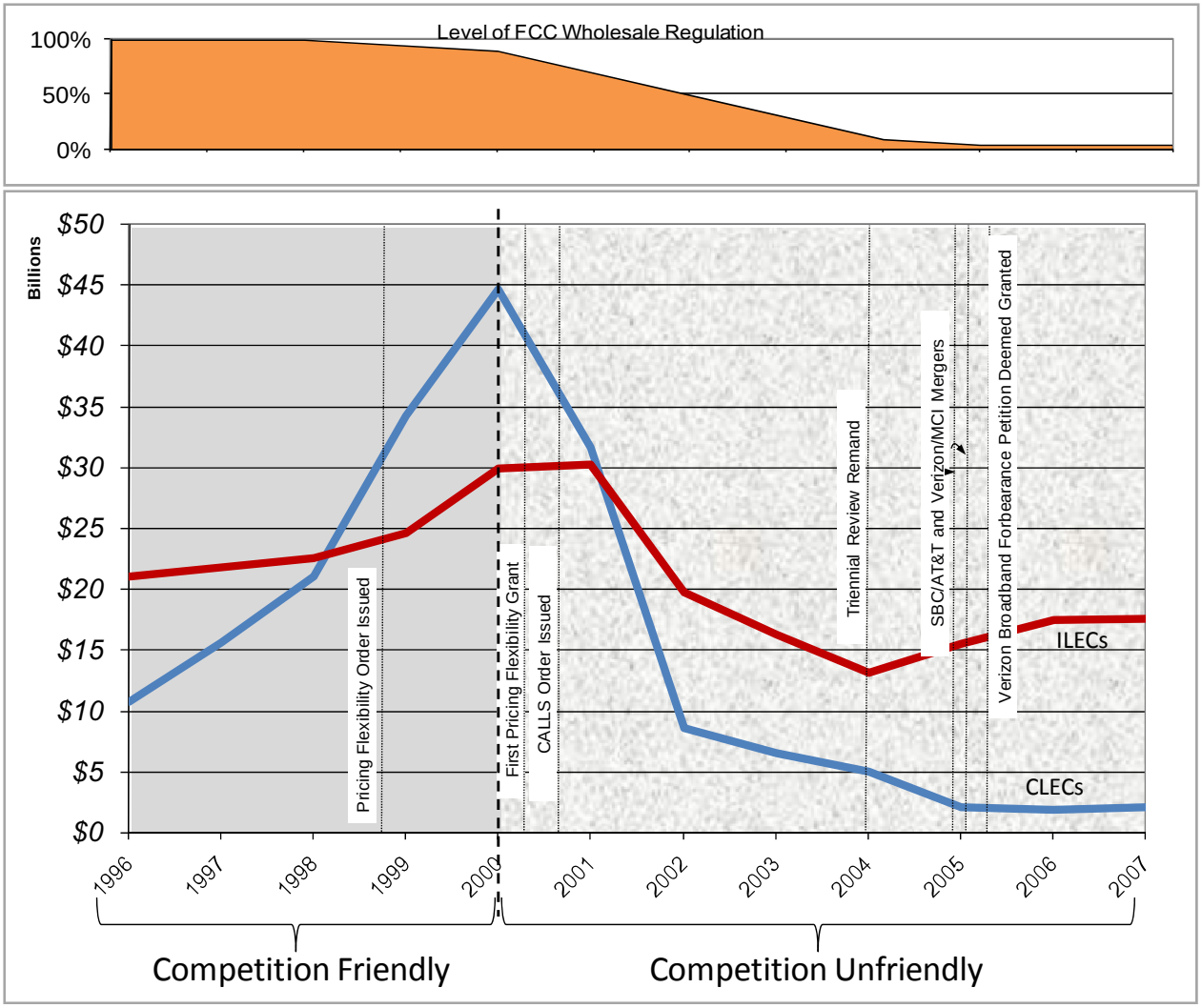

Figure 1- 3 Comparison of ILEC and CLEC capital expenditures demonstrates that deregulation does not spur investment – 1996 – 2007.

[20] ILEC data is drawn from FCC ARMIS Report 43-02, USOA Report: Table B-1.B, Years ending 2001-2007. Available at http://www.fcc.gov/wcb/eafs (accessed March 4, 2009). CLEC data is drawn from company 10-K annual reports filed with the SEC, available at http://www.sec.gov/edgar/searchedgar/webusers.htm (accessed February 2009).

Most of those CLECs that have not gone out of business have either been acquired by others – often at bargain basement prices – or have significantly curtailed their capital spending and business ambitions. Our *Role of Regulation* paper documented the decline in CLEC market capitalization and also compared that data to investment levels of Canadian CLECs operating in an environment that retains more vestiges of wholesale regulation than the US.[21] The evidence from that paper and from our analysis here is clear:

- Regulated access to ILEC wholesale facilities appears to stimulate competitive carrier investment by making competitors more viable and responsive competitors, offering customers geographic scope comparable to that available from ILECs. It also stimulates ILEC investment responsive to competitive innovations.
- Deregulation of wholesale ILEC services operates to insulate ILECs from competitive inroads and pressures with the exception of those mass market segments where competition from cable and mobile wireless has developed. Remaining competitors for business and date services have been left confined to a role of marginal, fringe players incapable of offering a meaningful competitive challenge to the ILECs. The result is restoration of *de facto* ILEC monopoly for non-mass market services where cable is not a significant presence but without the regulatory tools to ensure that ILEC services continue to be offered at just and reasonable rates.

Empirical evidence confirms that the removal of regulatory 'costs' did not encourage ILECs or CLECs to invest.

Even if macro-level trends in the economy might have resulted in overall reductions to capital investment levels (for example, after the "tech bubble" burst in 2000-2001) the elimination of regulation of wholesale services exacerbated the general economic trend and

[21] ETI's analysis comparing US and Canadian CLEC investments in *The Role of Regulation* was criticized by William Taylor, claiming that ETI had neglected to include capital expenditures associated with Cable companies in the US numbers. He presents his own version of Figure 13 from that paper purporting to correct this mistake. ETI's analysis did not include investments associated with Cable companies because cable company entry into the US mass markets is not impacted by US wholesale regulatory policy in the same way as CLEC entry (see discussion in footnote 16 above). Moreover, even if one were to include cable companies as CLECs for these purposes, Taylor's "correction" presents an erroneous picture of actual US CLEC/Cableco investments, since he apparently included 100% of the capital expenditures from the four largest US cable companies for the period 1996 to present, including their sizable investments in legacy video plant. We are unaware of any method of breaking out telephony and broadband investment from legacy video investment and Taylor appears to have made no effort to have done so to the Capex numbers he presents: his data sources, publicly available 10-K annual reports, do not allow for such a breakout. Taylor also appears to have included fabricated data for Cox Communications for 2006 and 2007, years for which public financial statements are not available after the company was taken private. Taylor's flawed critique of our data analysis render it of no use to those seriously attempting to understand the factors driving CLEC investment levels.

while investment throughout the rest of the economy rebounded after a year or two investment by ILECs and CLECs did not. As the data in Figure 1.3 above reveals, the level of CLEC investment continued dropping year after year following its initial drop during 2001. CLEC annual investment at its peak (2000) reached approximately $45-billion. Just two years later CLEC annual investment for 2002 had dropped by about 80% to less than $10-billion. For the 2004 annual period CLEC investment had dropped by a half again to $5-billion and by 2007 annual CLEC investments were down to a number in the $2-billion range. ILEC investment levels also failed to return to their pre-2000 and 2001 levels although there was a moderate recovery in ILEC investment levels beginning in 2005 – presumably in response to investment and inroads being made by cable companies into mass market telephony and broadband.

Corroboration for our conclusion that the slight rebound in RBOC investment beginning in 2005 was made in response to cable company competition for mass market broadband services come from two sources. First, AT&T's and Verizon's annual reports to shareholders reveal that the vast majority of the investment that has been occurring in their ILEC networks since 2005 has been directed at mass market broadband deployment – FiOS and U-Verse.[22] Equally compelling is analysis of cable broadband penetration rates in relation to both ILEC and Cable company investment levels. Figure 1.4 below presents cable company investment levels for the years 2000 to 2007. As the analysis demonstrates, cable company annual investment levels peaked in 2001 (the first year that cable company mass market broadband deployment passed more than 50% of US households) dropping off by a little over a third through 2004 and starting to climb again in 2005. ILEC annual investment levels illustrated on Figure 1.3 had dropped by more than half between their peak in 2001 and 2004 but began a modest increase in 2005[23] when cable company mass market broadband deployment had already passed 90% of households nationwide and cable company investment also began to climb.

[22] See discussion of FiOS and U-Verse investments in our paper *Longstanding Regulatory Tools Confirm BOC Market Power: A Defense of ARMIS*, prepared for the AdHoc Telecommunications Users Committee, January, 2010, at 20 – 24.

[23] Although ILEC investment began to grow again in 2005 it reached only 60% of the pre-2001 levels by 2007 – the last year for which investment data is available.

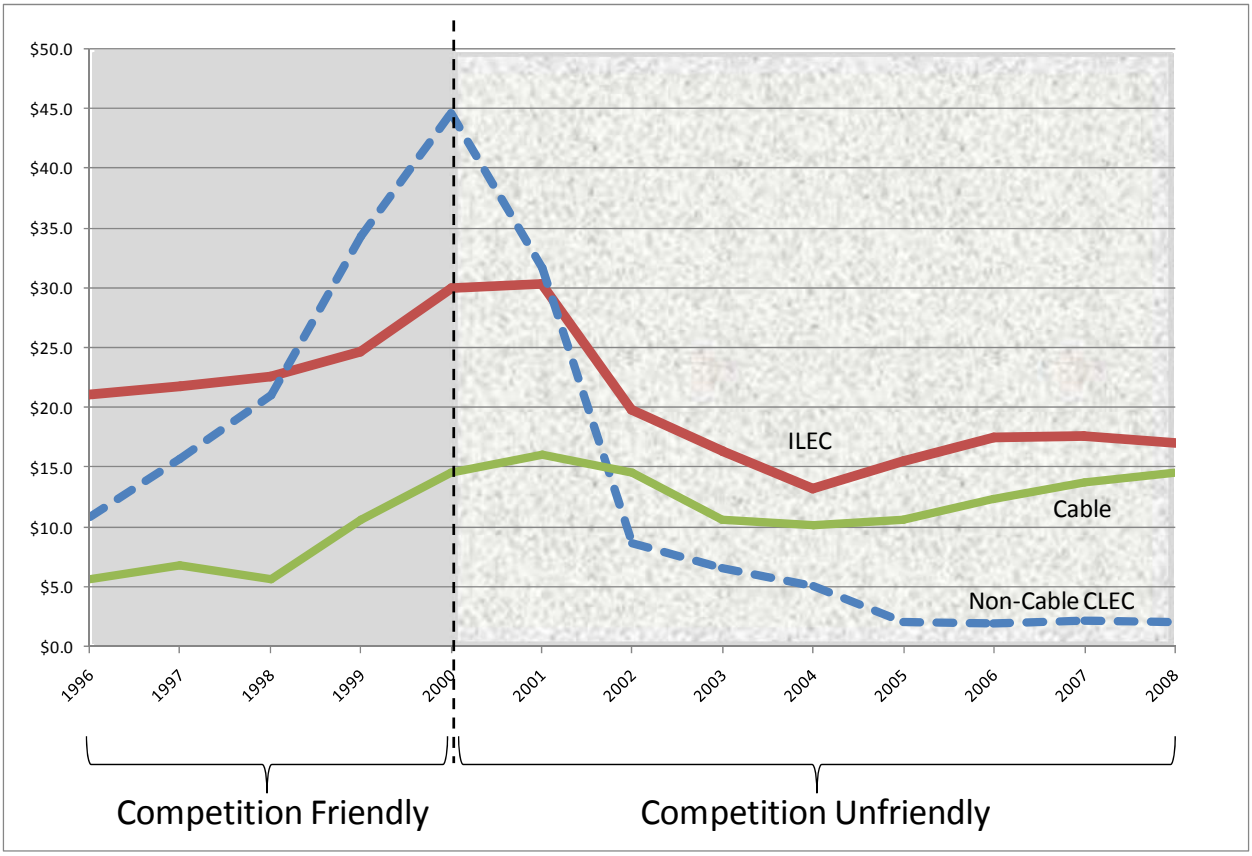

Figure 1- 4 Comparison of ILEC, non-cable CLEC and cable company capital expenditures 1996 – 2008.

The cable company investment data used in Figure 1.4 above is over-inclusive in that it includes all cable company investment – including that deployed for the provisioning of legacy video services (although by 2000, the first year of our analysis, much of the construction associated with cable company legacy video services had been completed) Although not directly comparable to the ILEC data it is presented for two purposes that do not require direct comparability of the bases. First, it is offered to demonstrate that unlike ILEC and CLEC investment levels, cable company annual investment had rebounded to close to peak year levels by 2007 – despite the fact that cable company broadband capability already passed more than 90% of households by the end of 2005. Second, it is offered in support of our position that it was competition with mass market cable-based broadband services, not elimination of regulations on ILEC wholesale services, that caused the up-tick in ILEC investment levels beginning in 2005.

Elimination of wholesale requirements was followed by a reduction in jobs in the telecom sector.

As the graphics below clearly illustrate, coincident with the elimination of regulation of wholesale broadband services was a loss of some 400,000 US jobs in the non-wireless segments of the US telecom industry. We believe it is fair to view these job losses as one of the "costs" to the US economy of deregulation. Despite the proliferation of demand and explosion of consumer and business spending on telecommunications services over the last decade, the industry as a whole today employs 40% fewer workers than it did at year-end 2000. (See Figure 1-5) These are not American jobs that ceased to exist because demand for the product dried up. These are not American jobs that ceased to exist because less expensive foreign imports took their place in the market. For the most part these are not American jobs that ceased to exist because employers outsourced the work off shore. The most plausible explanation is that these American jobs ceased to exist specifically because the FCC and the courts decided to limit wholesale access to underlying ILEC telecommunications facilities and services for which no

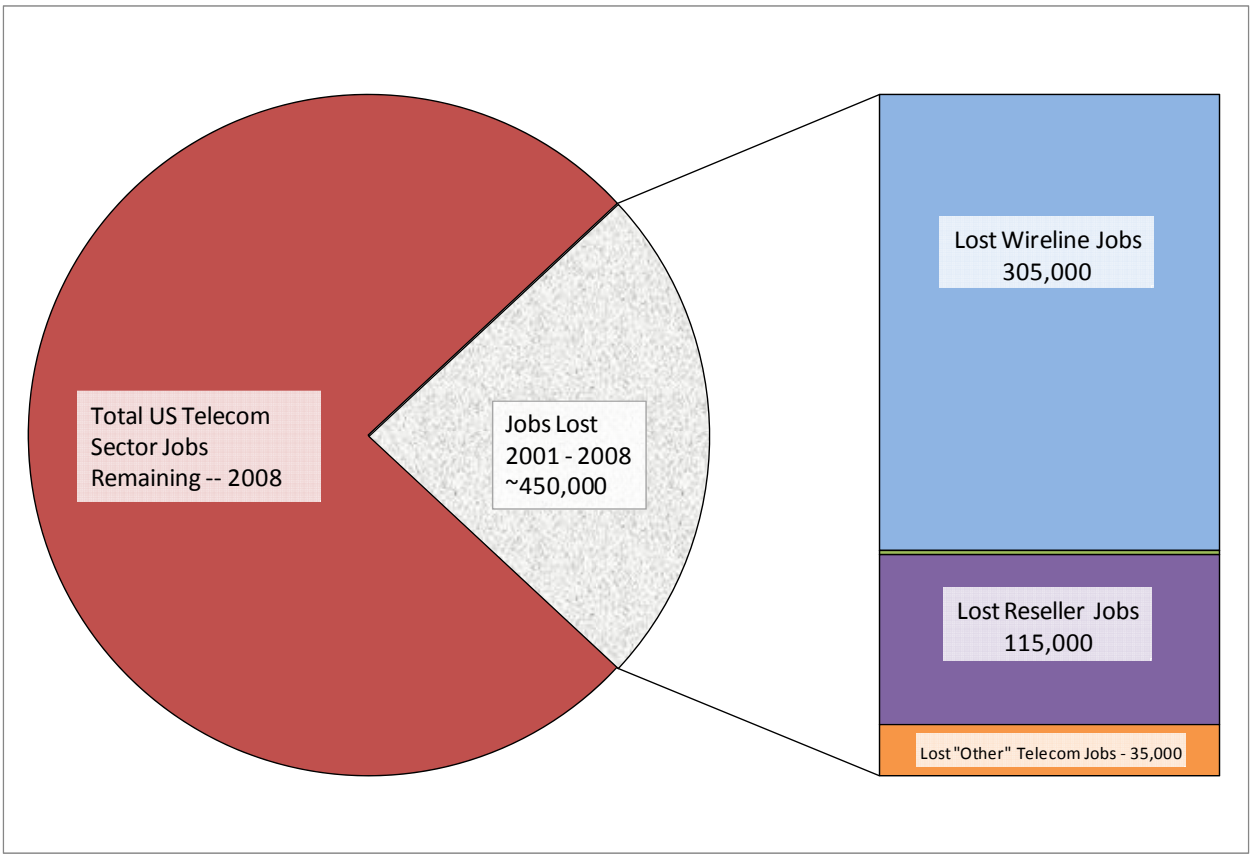

Figure 1- 5 Telecom Sector job losses 2001 to 2008.

other competitive alternatives existed.[24] An otherwise healthy and growing segment of US jobs in a relatively highly compensated, high technology market suddenly stalled and then shrunk – and absent a change in the regulation of wholesale telecommunications services – further job losses are a near certainty.

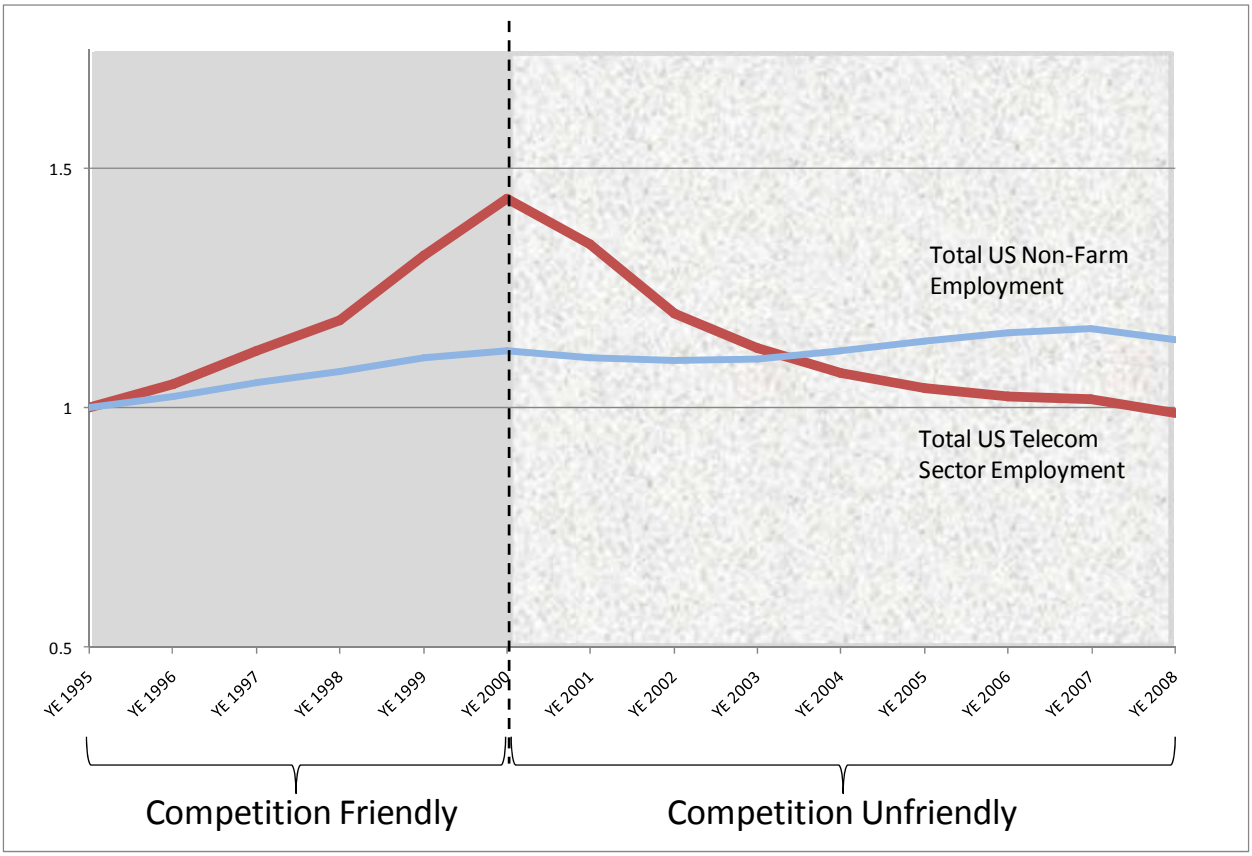

Figure 1- 6 Indexed changes in US telecom sector employment compared to total US non-farm employment: 1995 – 2008.

Comparison of trends in employment levels in the US economy as a whole with those that occurred in the telecom sector demonstrate that the telecom job losses cannot be laid at the feet of the same trends that have impacted the overall US economy. Figure 1-6 above compares indices of total US and telecom sector employment from year-end 1995 through September, 2009. During the "competition-friendly" period, employment in the telecom sector grew more than three times as fast as overall US employment. Moreover, while overall employment growth economy-wide was interrupted for a short period starting in 2001 but then recovered and began

[24] While automation may be responsible for some job losses in this segment most of the lost jobs were not the result of automation, but of reduced activity.

growing again, telecom sector employment plummeted and has continued to drop throughout the entire eight year "competition unfriendly" period.

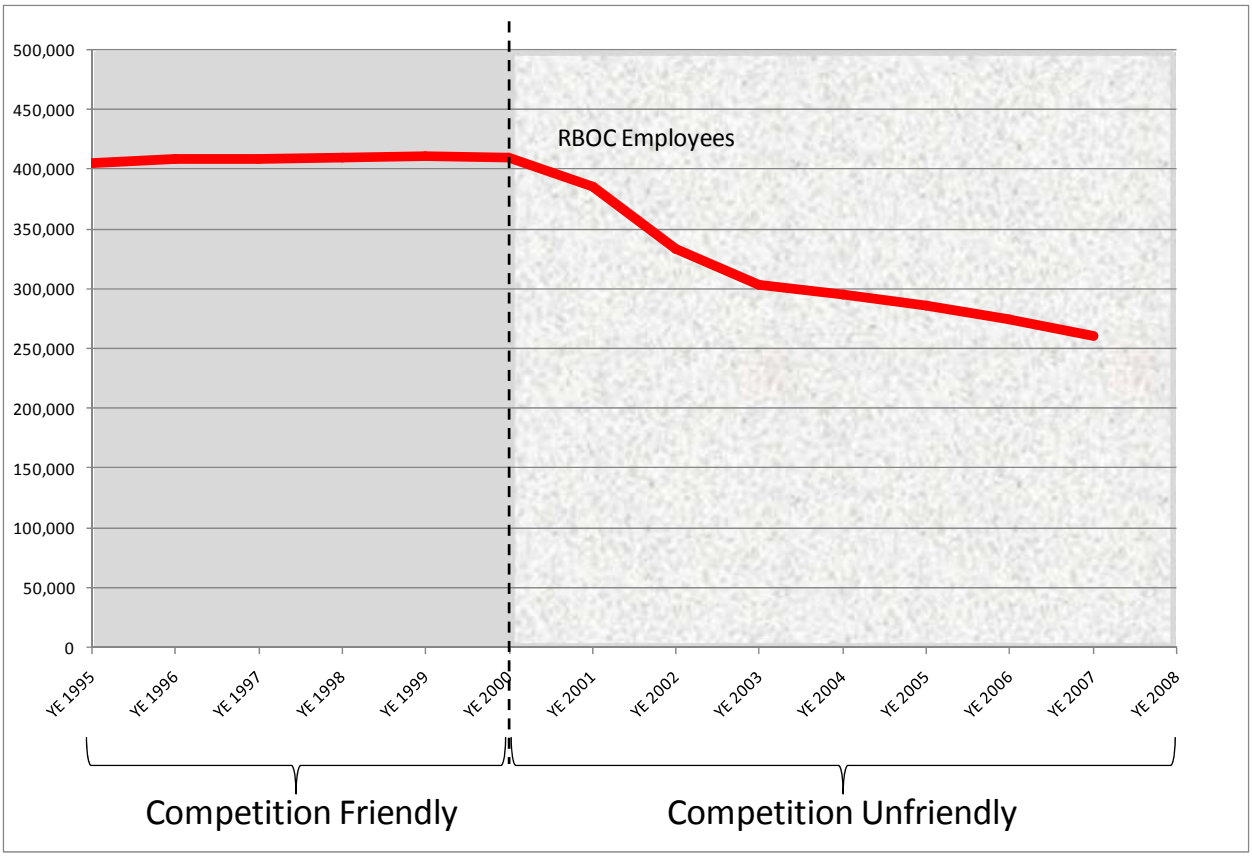

Figure 1- 7 Almost 150,000 BOC jobs have been lost since year-end 2000.

As competition from both facilities-based and resale-based CLECs dried up beginning in around 2001, not only were CLEC jobs lost, the ILECs – no longer facing the same level of competition, actual or potential – began contracting their workforces as well. As Figure 1-7 below demonstrates, during the years 1996 through 2000, while being forced to make their underlying wholesale facilities available to competitors, RBOC employment remained almost constant at approximately 400,000.[25] Between 2001 and 2007 (the last year for which such data

[25] This encompasses what we have described as the "competition friendly" period from the end of 1995 at which point it was clear that some manner of Telecom Reform would be enacted in the US Congress requiring broad availability of RBOC facilities on a wholesale basis to the beginning of 2001by which point it became clear to all involved that the RBOCs had succeeded convincing regulators of their party-lines regarding the damage those same wholesale regulations were causing and that the march to the virtual elimination of those rules had begun.

has been collected) that number dropped to 260,000. 140,000 RBOC jobs – at one time one of the most coveted employment positions in America – had simply ceased to exist. To put those 140,000 lost jobs in perspective, one out of every three "phone company" jobs vanished during this period. In other words, rather than producing any net positive economic benefit, the "cost" to society of eliminating those wholesale requirements and as a result limiting the extent of competition that the BOCs would face was the elimination of 140,000 well-paid, fully benefited, RBOC jobs and tens of thousands of CLEC jobs across the US.

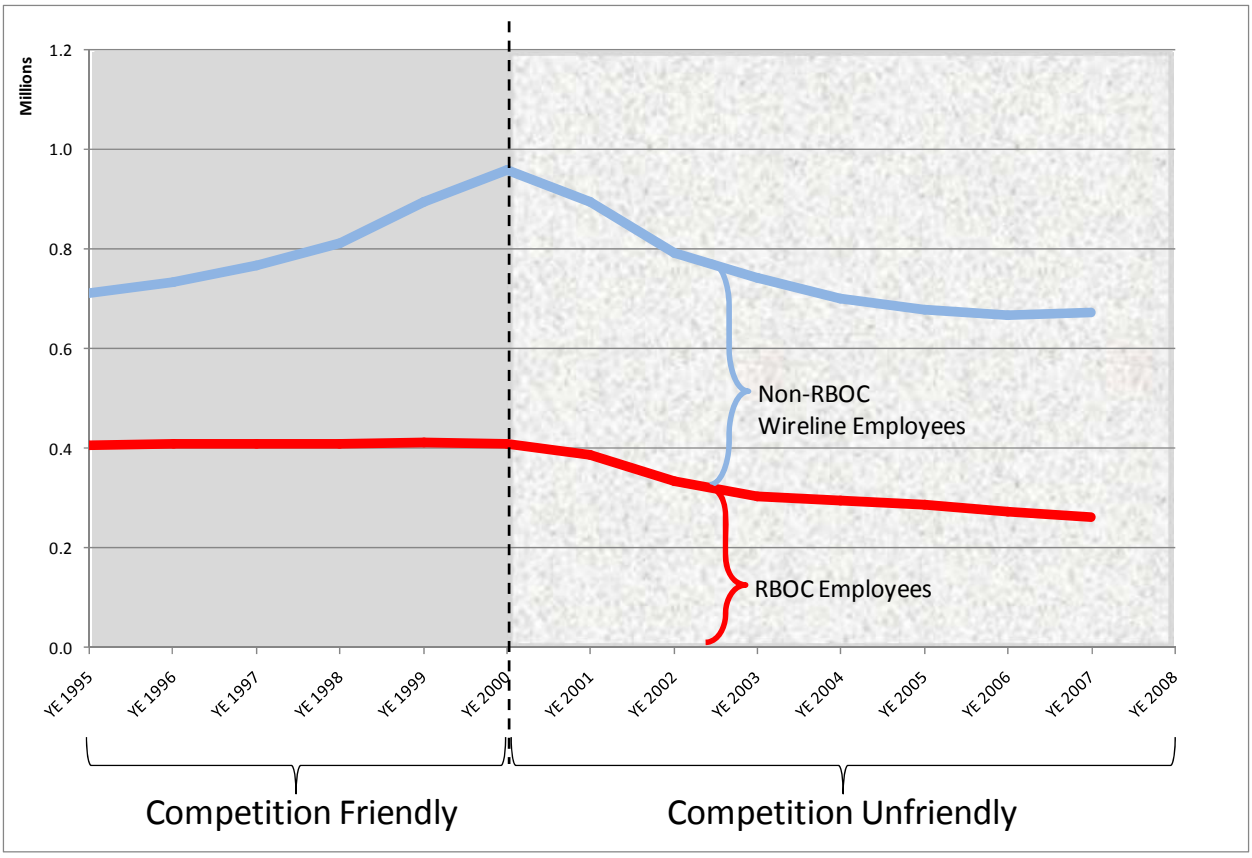

Figure 1- 8 Changes in numbers of RBOC employees compared to changes in numbers on non-RBOC wireline telecom employees: 1995 – 2008.

During the "competition friendly" immediate post-TA96 period (1996 through 2000) when RBOC employment held steady, other wireline carriers (IXCs and CLECs, Cablecos) and telecom resellers added some 300,000 employees to their payrolls. Virtually all of those were full-time employees so the cumulative person-years of non-BOC wireline telecom employment growth during that period approximated 700,000. This telecom sector employment growth during the immediate post-TA96 time frame supports the conclusion that strong wholesale regulation spurred substantial and significant job creation throughout the non-BOC portions of

the wireline telecommunications industry (primarily IXCs and CLECs, including cablecos). Figure 1-8 on the previous page illustrates employment levels in the "wireline" portion of the telecom sector (as defined by BLS) and displays a steady and substantial increase in non-RBOC employment throughout the sector until the regulatory regime began to change – at which time "wireline" employment by both BOCs and non-BOCs began its steady and unending decline.[26] Figure 1-9 displays the employment data during this period for all of the BLS reported telecom sectors.

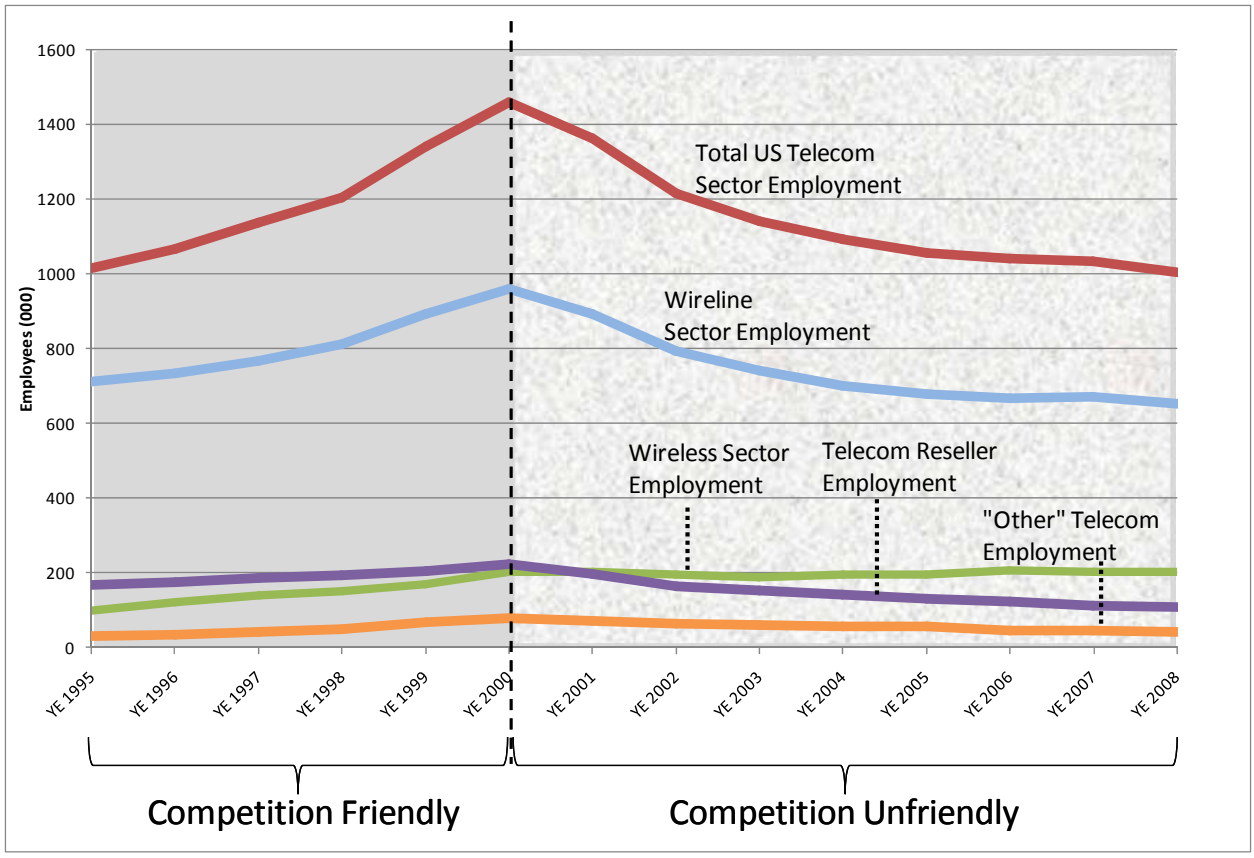

Figure 1- 9 Comparison of job changes overall in the US Telecom Sector to changes in the Wireline, Wireless, Reseller and "Other" telecom subsectors: 1995 – 2008.

It has been suggested that the 'tech bubble crash' of 2000 and 2001 has more to do with the decline in investment and jobs overall than with the evolving telecom regulatory regime. The

[26] It should be noted that the BLS "wireline" category does not include telecom resellers – a category of competitor that was hit as hard as any other by the change from a "competitive friendly" to "competitive unfriendly" regime. Were resellers included in Figure 1-6 above the overall increase in employment during the first period would have been greater, and the drop-off in employment steeper following the regime change.

evidence however does not support that view. Figure 1-10 below presents indexed jobs data for the primary segments of the telecom sector as categorized by the BLS. If the downturn in employment was associated with the end of a bubble, one would expect a one-time drop, followed by gradual recovery. Instead, the wireline, reseller and "other" employment levels began their decline during 2001 and have never fully recovered. Only the wireless segment shows job growth – a striking divergence from the rest of the indexed data. Like the rest of the sector, employment in the wireless segment dropped during 2001 through 2003 (although less steeply than in the wireline or reseller segments), but by 2004 the number of US wireless segment employees had begun to increase again, and by 2006 any job losses that might have been attributable to the end of the "tech bubble" had been regained. By year-end 2008, there were slightly more US workers in the wireless industry than at year-end 2000. If the general economic conditions in 2001 and 2002 had been responsible for the substantial drop in telecom sector employment, employment levels should have rebounded in the wireline and reseller categories as well.

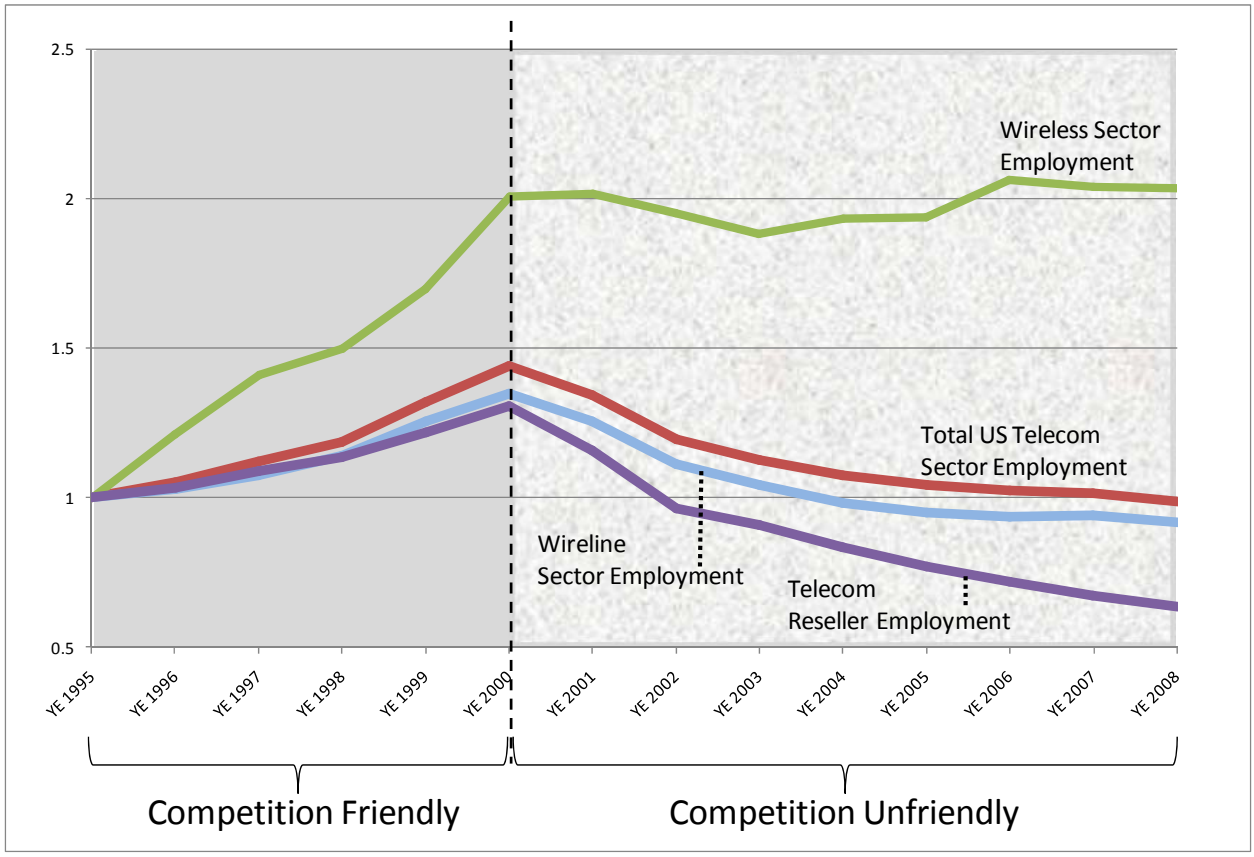

Figure 1- 10 Indexed comparison of employment trends in the US Telecom Sector to changes in the Wireline, Wireless, Reseller and "Other" telecom subsectors: 1995 – 2008.

The last graphic in this section, Figure 1-11, illustrates what we are describing as the 'costs' in terms of American jobs of the FCC's failed experiment of wholesale deregulation of the RBOCs. Thirty-one percent of all jobs in the telecom sector (including wireless) were lost between January 1, 2001 and December 31, 2008. 32% of the jobs in the wireline segment,[27] and 52% of jobs in the resale sector of the industry, are simply gone. The only segment of the telecommunications industry where employment increased was wireless telecommunications, where, during the relevant period, there have been four or more competitors in virtually every geographic market. The linkage between competition in the telecom market and the prospects for maintenance or growth of employment in that sector could not be clearer.

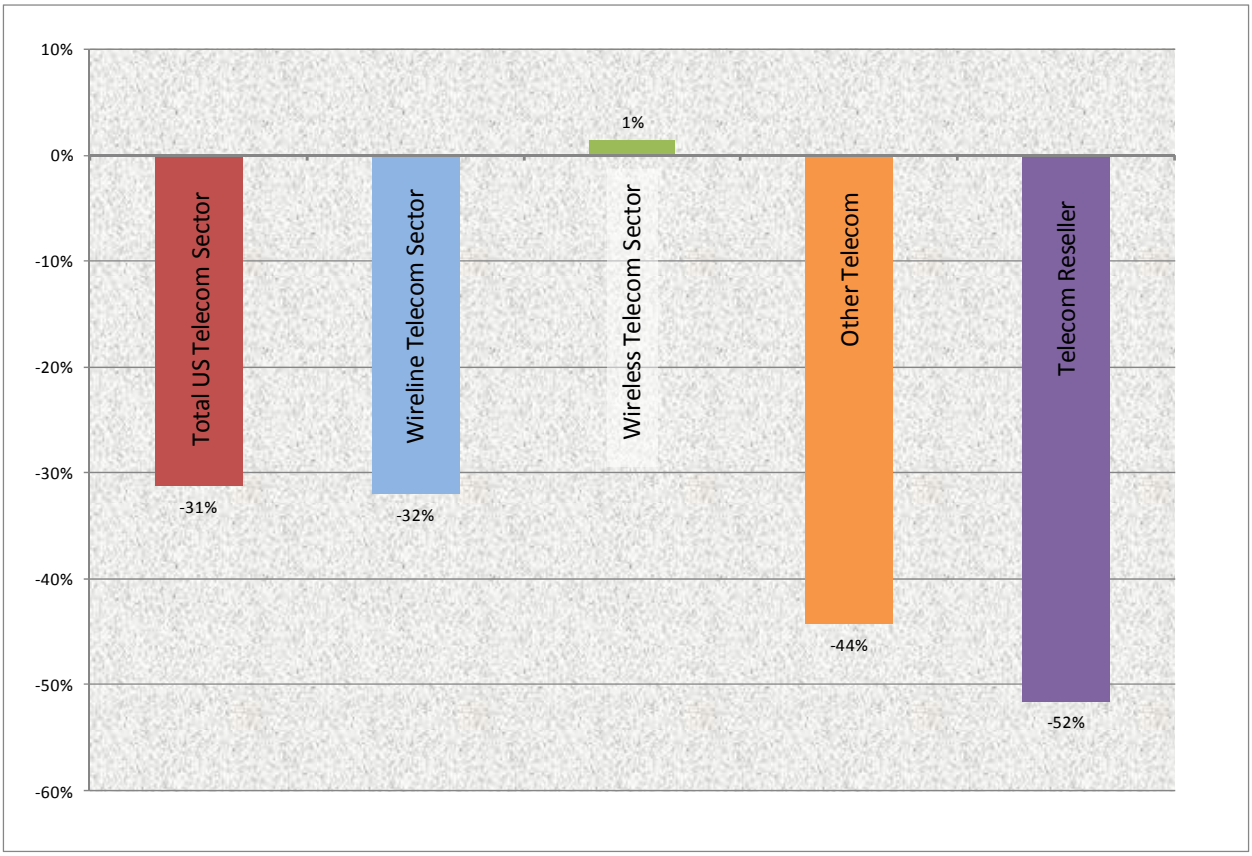

Figure 1- 11 Job losses across US Telecom sectors during the "competition unfriendly" period: 2001 – 2008.

[27] Per the descriptions in the BLS databases, the "wireline" category includes cable employment.

2 DRIVING PRIVATE SECTOR TELECOM INVESTMENT AND JOB GROWTH

Private sector investment in broadband telecom infrastructure by ILECs and by CLECs may be stimulated by adopting a competition-friendly regulation climate, one capable of ensuring that wholesale access to underlying ILEC facilities is and will continue to be made available to entrants that desire to incorporate those wholesale facilities into service offerings of their own. By implementing relatively modest changes to the wholesale telecommunications regulatory environment, the FCC could work towards meeting its goal of encouraging ubiquitous broadband availability and do so using private, not public funds. Our modeling estimates an increase in private sector investment in broadband telecommunications network facilities of as much as $60-billion by the end of 2014 and telecom sector job-growth of as much as four hundred and fifty thousand American jobs. Additional economy-wide growth off $66-billion and an additional 234,000 jobs over the next five years would also be expected to flow from a reimplementation of several of the FCC's rules that have been dismantled during the last decade.

Reasonable Pricing of ILEC Wholesale facilities should stimulate private sector broadband Investment, create telecom sector jobs, and create broad economic benefit for the US.

If policymakers were to undo some or all of the harmful deregulatory actions of the last decade, how much better off could conditions be in terms of investment and job creation? Our modeling suggests that substantial additional private sector investment in advanced network services would be stimulated by policy-mandated corrections to the wholesale telecom market.[28] That increased investment would lead to substantial job growth throughout the telecom sector, and the increased facilities-based competition would result in lower prices for services purchased in large quantities by business customers. The savings by businesses of all sizes and in all sectors of the US economy on their telecommunications purchases would in turn lead to

[28] Underlying our modeling is a premise that re-creation of a "competition friendly" environment like that found immediately post-TA96 is likely to invigorate competition and that increased competition will lead to increased investment and jobs – in other words – that the *correlation* that we demonstrated in the previous chapter is a reflection of a causal link between wholesale regulation and investment and job levels in the telecom industry.

additional economy-wide investment and job growth. In short, ensuring economic wholesale access to incumbent LEC telecommunications facilities as envisioned in the 1996 federal legislation should speed the delivery of "high speed ubiquitous broadband" [29] and should, in particular, expand broadband options for small businesses that depend upon competitively priced, innovative broadband services to enhance efficiency, remain competitive and create new jobs.

Identifying the exact changes policymakers would need to implement in order to reverse some of the damage that has been wrought by disrupting the original wholesale mandates that existed prior to 2001 is beyond the scope of this paper. It is possible, however, to identify several categories of relatively simple-to-implement "corrections" that would make it feasible for competitors to justify making the significant investments necessary to become long-term participants in high-speed broadband telecommunications markets. The results of the prospective investment and jobs impacts modeling that are detailed later in this chapter are premised upon the assumption that changes in the nature of those identified below are implemented.

Policy Changes Needed to Ensure Sufficient Wholesale Access to ILEC Broadband Services

i. Roll back forbearance from dominant carrier and common carrier regulation and from unbundling of services. Packetized services, most importantly Ethernet, are basic transmission services in a broadband world and must be recognized as such. Wholesale special access and unbundling rules and regulations must apply to these services.

ii. Require carriers to make packetized data streams available to competitors so that they can utilize those facilities to develop and market efficiency enhancing products to small businesses. Such data streams should be available without regard to the underlying incumbent LEC network architecture.

iii. Implement a mechanism (a reformulated price caps plan or some other mechanism) to ensure that prices for special access services, including TDM and Ethernet services, are set at "just and reasonable" rate levels.

iv. Access to FTTC and FTP and dark fiber to serve business customers.

v. Establish rules to ensure that the prices that ILECs charge for Section 271 checklist items are "just and reasonable," consistent with the methodology proposed by a coalition of CLECs.

[29] *National Broadband Plan NOI*, at para 1.

Forecasts of quantifiable "benefits" that we believe should be expected to flow from these market opening changes are described and illustrated in the sections that follow. Specifically:

- *Stimulation of investment in high speed broadband infrastructure*, particularly infrastructure deployed to the kinds of business customer locations that have not been addressed by much of the mass-market based investment resulting from the limited – and primarily residential-oriented – competition that exists as between the ILEC and the Cableco serving any particular geographic area. We forecast year-over-year investment growth and cumulative investment expenditures over a five-year period under what we believe to be conservative, moderate and realistic assumption sets.

- *Creation of jobs throughout all segments of the telecom industry*. As with our investment analysis, we forecast year-over-year job additions and cumulative job growth over a five-year period under what we believe to be conservative moderate and realistic assumption sets.

- *Stimulation of economy-wide economic growth* and *ensuing economy-wide job creation* flowing from the efficiency enhancements and reduced prices that will result from the enhanced competitive opportunities that will exist in the downstream retail telecommunications markets – particularly the markets for business broadband services.

Spurring substantial high-speed broadband investment and creating new jobs throughout the telecom industry.

Our modeling of the impact of a new market-opening focus by federal policymakers is informed by an extrapolation based upon actual historical outcomes. A policy paradigm that would make ILEC wholesale last mile facilities dependably available at economic price levels should spur additional investment both by ILECs and by CLECs – and should lead to the steady creation of good sustainable employment opportunities throughout the telecom industry. Employment growth can be expected to occur rapidly as competitors – once again able to address segments of the market that have been foreclosed to them for the better part of the last decade – hire staff to develop products, design customer solutions, market their services and support customer care and similar functions. Longer-term competitor employment growth should also include American jobs for those building additional broadband infrastructure. ILECs – once again faced with competitors able to address the ILECs' currently-protected market segments – will also need to recruit and hire employees to respond to that new competition. Investment growth by CLECs would likely lag employment growth slightly as the turn-around time for constructing facilities is somewhat longer – although ILEC investment outlays might well increase more rapidly in anticipation of the growing competitive challenge.

Curing the lethargy in broadband build-out to businesses.

ILEC and non-cable CLEC[30] annual capex peaked in 2000 at approximately $75-billion, and the average capex for the three years preceding the precipitous drop-off in 2002 averaged $65-billion per year.[31] Combined capital expenditures for ILECs and non-cable CLECs have hovered just under $20-billion per year for the last four years. As discussed above, the vast majority of the ILECs' recent broadband build-out has been targeted at mass-market, primarily residential and the very smallest of business customers e.g., SOHO. Absent a fundamental change in the regulatory climate to something friendlier to competitors whose business plans focus on the entire spectrum of business customers, there is nothing on the horizon to suggest that private sector investment will grow much beyond its present levels. Our "realistic" scenario projects annual capital expenditures by ILECs and non-cable CLECs of $46-billion in 2014 – more than double today's investment levels but still significantly less than the amounts being expended a decade ago.

Present conditions in the capital markets will likely cause investment growth to ramp up more slowly than might have occurred at another time; this has been factored into our analysis. Overall, our forecasting of potential investment stimulation is conservative. Because of the complexity of the capital expenditure planning process in large corporations combined with the lead times typically required to fully implement major capital investment programs such as broadband deployment, we have modeled no investment stimulation in 2010, with the ramp-up not commencing until 2011 even though we have been told that some CLECs would in fact increase investment levels immediately during 2010 were some of the regulatory changes they seek implemented. Notably, under none of the scenarios we analyzed does the total annual investment by ILECs and CLECs combined reach the level of any of the three peak years – 1999, 2000 and 2001 – prior to the major policy swings that so decimated competition at the start of this decade.

We modeled three investment stimulation scenarios – a conservative scenario, a moderate scenario and a scenario we believe to be more realistic than either of those. In each of these, the baseline investment levels were set at total 2008 ILEC and non-cable CLEC capital expenditures. Cable company investment levels were excluded from the investment baselines because these companies' primary focus is upon mass market services, mainly residential broadband,[32] whereas our concern here is with the business broadband services market that up to now cable operators have shown little interest in pursuing on a stand-alone basis.[33] Although mass market cable

[30] The focus of our report is the business broadband market. To date, there is no evidence that we are aware of that suggests that cableco broadband build-out has made any serious inroads in connecting to business facilities.
[31] See Chapter 1 above.
[32] The data sources for the figures and tables used in this Chapter correspond with those used for the tables and figures in Chapter 1.
[33] For the most part, cable television MSOs have adopted a network architecture based upon hybrid fiber/coax technology. While perfectly acceptable for most mass market applications, present constraints on upstream

investments have not been included in the dollars used as the base of our analysis, cable companies growth into business markets is not excluded from our forecasting. The modeling parameters used in each of the forecasts are detailed in Table 2-1 below.

Table 2-1

Baselines and Assumptions for Telecom Investment Growth Modeling

	Period	**Carriers included**
Baseline Investment Levels Being Grown	December 31, 2008	ILECs and non-cable CLECs
	Index Development	**Application of Index**
Conservative Scenario	Index developed based upon investment changes 1996 – 2008 for Cable Companies	Index applied to combined ILEC and non-cable CLEC base
Moderate Scenario	Separate Indices for ILECs and non-cable CLECs based upon investment changes 1996 - 2000	Indices applied separately to ILEC and non-cable CLEC portions of base (ILEC index to ILEC base and CLEC index to CLEC base)
Realistic Scenario	Index developed based upon investment changes 1996 – 2000 for combined ILECs and non-cable CLECs	Index applied to combined ILEC and non-cable CLEC base

The model results are plotted on Figure 2-1 below. Even under our most conservative assumptions, by the end of 2014 close to $20-billion in additional private sector investment in business-oriented broadband facilities will have been constructed. Under what we believe to be a more realistic scenario, by 2014 annual investment levels by ILECs and CLECs will have more

bandwidth limit the utility of this approach for many medium and large enterprise telecom uses. Some cable operators have made limited forays into fiber-to-the-premises deployment as a means of serving enterprise customers, a strategy that places them in exactly the same position as non-cable CLECs seeking to address this market. In order to offer enterprise customers a single-source solution capable of meeting their needs at all required locations, the cable CLEC affiliate has essentially the same need to obtain economic access to ILEC wholesale last mile broadband infrastructure as any non-cable competitor seeking to address this same market.

than doubled and $60-billion in additional private sector investment will have occurred.[34] Table 2-2 below details the results of our analysis.

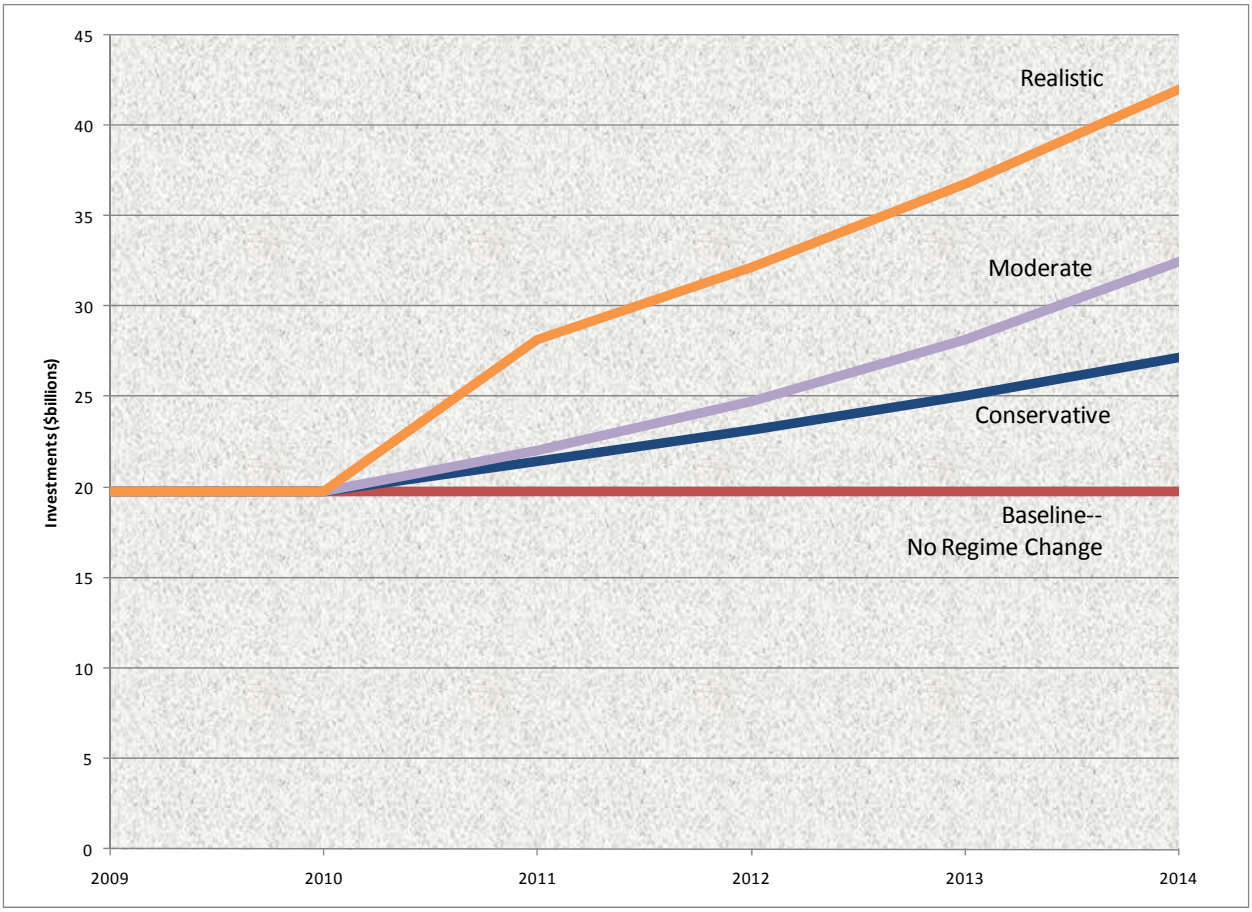

Figure 2- 1 Projected increases in US telecom investment by ILECs and CLECs through 2014 resulting from a re-instatement of wholesale service regulations.

[34] This scenario projects investment growth by non-cable CLECs and ILECs to track the overall growth in investment in the cable market as cable operators began offering mass market broadband services. As discussed above, cable company competitors have not been hampered by the need for wholesale access services from ILECs in deploying services to mass market customers – offering a snapshot of the kinds of investment that can be expected once the wholesale access services that they do need are available to CLECs.

Table 2-2

Results of Modeling of Impact of Policy Changes Requiring Wholesale Availability of Current Generation Last-Mile Facilities on ILEC and CLEC Investment

SCENARIOS		Forecast Investment Changes by 2014	
		Additional Annual Investment by 2014	Cumulative Additional Investment 2010 to 2014
Conservative	Trend based upon investment trends for cable companies across since 1996 Act (1996 – 2008).	$7.5-bllion	$18-billion
Moderate	Trend based upon investment trends of ILECs and CLECs during the "competition friendly" regulatory regime (1995 – 2000) separately applied to each category.	$12.5-billion	$28.5-billion
Realistic	Trend based upon combined investment trends of ILECs and CLECs during the "competition friendly" regulatory regime (1995 – 2000)	$26.5-billion	$59-billion
No Policy Change	Investment growth under current deregulatory regime	0	0
Dollars rounded to the nearest half-billion			

Almost a half-million new telecom sector jobs in the next five years.

In Chapter 1 we demonstrated our calculation of the "cost" to the US economy attributable to the FCC's elimination of regulation of wholesale broadband services: a loss of more than 400,000 US jobs in the non-wireless segments of the US telecom industry. By reversing this policy now, the FCC has the opportunity to contribute to the overall economic recovery by reinstituting the pro-competitive, market-opening regulatory measures that were built into the 1996 legislation and whose effectiveness in stimulating investment and job creation in the immediate post-TA96 time frame we find to be beyond dispute. The tables and figures following demonstrate the significant economic gains that we believe are available under a "competition friendly" regime that requires the ILECs to dependably make wholesale business broadband services and facilities available to rivals for use in downstream markets at reasonable prices and on reasonable terms and conditions. In each of the three scenarios we studied, we

used as the baseline level of employment the "Non-Wireless" telecom sector jobs reported by the Bureau of Labor Statistics as of September 2009. [35]

Table 2-3

Baselines and Assumptions for Telecom Sector Jobs Growth Modeling

	Period	**BLS Job Category**
Baseline Jobs Being Grown	September, 2009	Wireline Telecom Jobs (all jobs in BLS NAICS 517- Telecom excluding Wireless (NAICS 5172))
Conservative Scenario	Growth trajectory based upon indexed growth in jobs 1/1/2003 to 9/30/2009	Non Wireline Telecom Jobs in the Information Sector (BLS SuperSector 51)
Moderate Scenario	Growth trajectory based upon indexed growth in jobs year 1/1/2003 to 9/30/2009	Overall US non-farm Employment (BLS Supersector 00000000)
Realistic Scenario	Growth trajectory based upon indexed growth in jobs 1/1/1995 1995 to 12/31/2000	All Telecom Jobs (all jobs in BLS NAICS 517 – Telecom)

Our first scenario, labeled "conservative," uses an index based upon all non-wireline telecom employment in BLS "Information" supersector 51 (of which telecom is a segment) for a period beginning in January, 2003 (when the economy began recovering following the 2001-2002 economic downturn) and ending with jobs in those categories reported as of September 30, 2009. The "conservative" label is used because, like the "moderate" category identified below, this index reflects the significant job losses experienced during the current recession and, in addition, includes industry segments significantly impacted by "off-shoring" of jobs during this period (for example call centers) and industry segments that have been negatively impacted by the growth of the internet (e.g., newspapers). As such, our "conservative view" presents a very "worst case scenario" relative to the employment changes that can be expected in the "non-wireless" segment following changes in the regulatory structure. The index assumptions for each of the three scenarios used in our analysis are documented on Table 2-3 above.

[35] For purposes of our discussions here, "Non-Wireless" jobs are all those found in BLS NAICS 517 *Telecom* except NAICS 5172 *Wireless*. This includes Telecom Industry Subsectors *Wireline* (5172) and *Other* (5174 and 5179) which includes *Resellers* (517911). The *Wireline* subsector (5172) includes employees of cable companies.

Our "moderate" scenario assumed growth in 'non-wireless" telecom jobs paralleling the growth that had occurred in total US non-farm employment for the same January 1, 2003 to September 30, 2009 period reflected in the "conservative" scenario. This period represents the job trajectory that occurred economy-wide and that was not impacted by the change in the FCC's regulatory regime from "competition friendly" to "competition unfriendly." The scenario is labeled as "moderate" because the period covered includes employment data from the present recession – including the substantial economywide job losses that have occurred though out 2009.

Our final scenario and the one we believe to be most likely to occur is identified as the "realistic" scenario and assumed that growth in jobs in the "non-wireless" BLS telecom jobs category would parallel the growth that the entire Telecom sector experienced in the immediate post-TA96 period (year end 1995 to Year end 2000). This five-year period saw the strongest CLEC growth and ILEC responsiveness to that growth, and so most closely approximates the regulatory environment and market conditions that will be extant following the reregulation of wholesale broadband services.

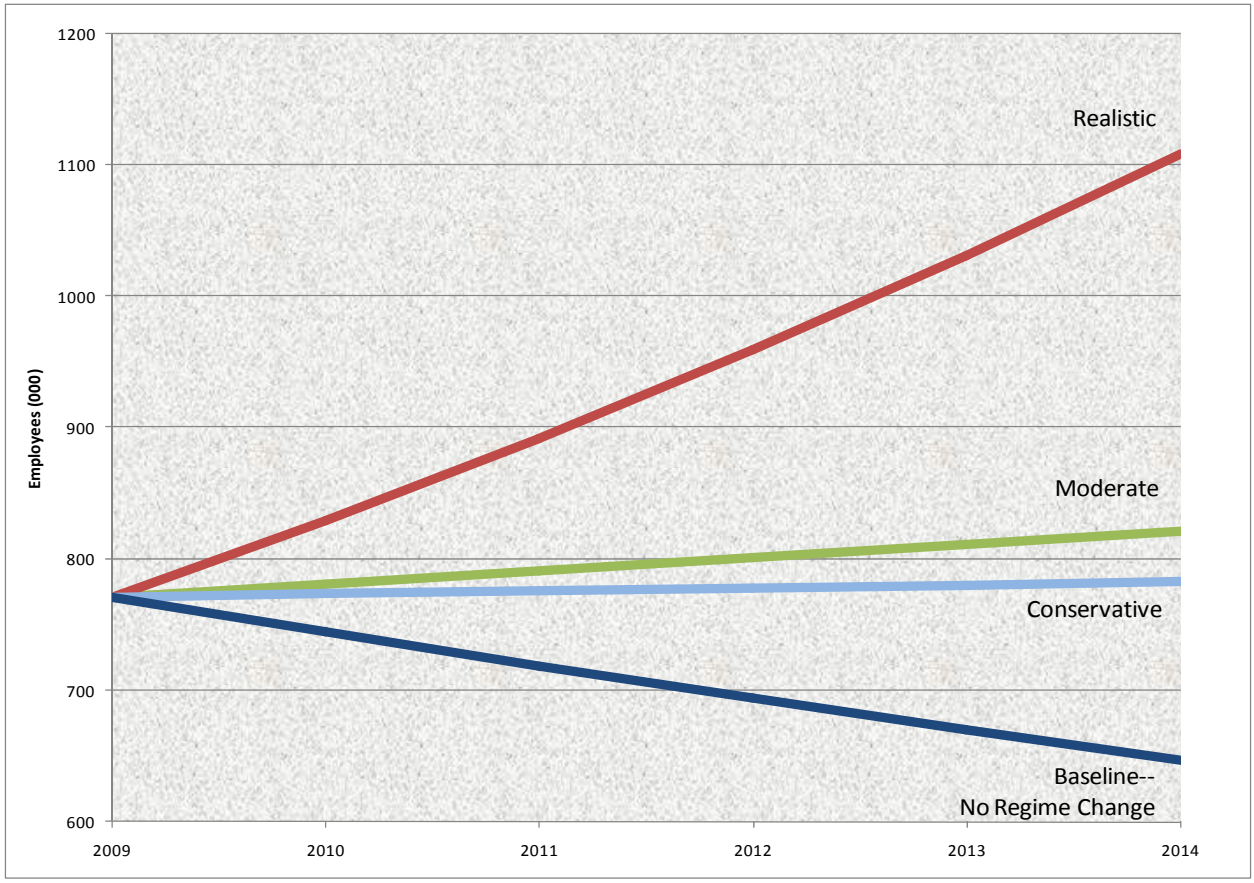

Figure 2- 2 Projected increases in US telecom sector employment through 2014 resulting from a re-instatement of wholesale service regulations.

Figure 2-2 demonstrates the economic gains that should result from reinstating regulation of wholesale broadband services. Even under our most conservative analysis, job losses in the wireline telecom segment are halted and slight growth occurs over the coming five-year period. Compared against the continuing job losses that will persist absent any change in the regulatory regime, the minimum difference we would expect to see at the end of five years under a more "competition friendly" structure is more than one hundred thousand American jobs saved. Under what we believe to be the most realistic scenario, the economy will gain more than 300,000 jobs relative to employment levels today. Compared against expected employment levels absent FCC action – reinstating regulation of wholesale broadband will promote investment, competition, and competitive responses that collectively will boost employment by some 450,000 over the next five years relative to retaining the regulatory status quo. Table 2-4 below demonstrates these results.

Table 2-4

Results of Modeling of Impact of Policy Changes Requiring Wholesale Availability of Current Generation Last-Mile Facilities on Telecom Sector Jobs

SCENARIOS		Forecast Jobs Changes by 2014	
		Jobs gained on 2009 Base	Jobs gained relative to expected job losses
Conservative	Trend based upon total Information supersector, less wireline telecommunications, 2003-2009.	11,297	136,182
Moderate	Trend based upon wireless telecommunications sector, 2003-2009	29,374	154,257
Realistic	Trend based upon total telecommunications sector, post TA '96 Act – 2000	337,730	462,614
No Policy Change	Jobs lost as a result of continued deregulation	(124,885)	

Public Policy Changes Will Also Generate Economy-Wide Impacts.

Reduction in the level of competition for the kinds of last-mile broadband facilities required by businesses and by non-ILEC telecommunications providers appears to have led to excessive pricing of last-mile services. As discussed above, this diminution in competitive alternatives is apparently the result of unrealistic expectations as to the development of widespread competition for last mile broadband facilities deployed to business locations, premature price deregulation based upon such unrealistic assumptions, and the elimination of opportunities for competitors to purchase essential last mile facilities on a wholesale basis from the ILECs at reasonable cost-based prices. In addition to the significant impacts upon investment and jobs in the telecom sector described above, the overpricing of essential business telecom services has had profoundly negative impact upon the overall US economy, as measured in terms of national output (GDP) and employment outside of the telecom sector. Reinstatement of regulation of wholesale last mile broadband services will have a multiplicative beneficial impact upon the national economy.

In order to estimate the macroeconomic impact of the lack of competition and reduction in investment and employment that has occurred in the telecom industry as a result of deregulation, it is necessary first to establish a metric for measuring the economic loss. The differential between actual BOC special access revenues and those that would have been realized had price regulation remained in place represents a drag on the economy. Following the elimination of most other wholesale avenues (specifically broadband UNEs), special access services remain as the only wholesale broadband service available to competitors. [36]

In 2007, BOC revenues from dedicated last-mile broadband special access services topped $17-billion and represented more than 50% of all BOC interstate business. Among the most recent pieces of regulatory "relief" granted to the BOCs was the elimination of any requirement to file cost or revenue data for their interstate services – making the 2007 results the most recent available. It is likely that for 2008 and 2009 special access revenues had increased to an even greater total dollar amount, and that they now represent an even larger portion of overall BOC interstate revenues than they did in 2007. For 2007, more than one-third of BOC special

[36] UNEs do still remain viable in some cases – although that can change on a case by case basis at any time with the reclassification of a wire center. CLECs can purchase DS1 and DS3 UNEs in wire centers that are deemed "impaired" under the FCC's rules; the vast majority of wire centers are impaired for DS1 loops and most wire centers are also deemed impaired for DS3 UNEs. For small businesses, the problem is that DS1s are increasingly viewed as delivering insufficient capacity for small business applications while DS3s actually provide too much bandwidth at too high a price to meet small business needs. Ethernet is the appropriate solution in those cases, but Ethernet is not available as either a regulated special access service or a UNE. For larger businesses, UNE DS3s are sometimes suitable, often, however, special access is the only viable alternative.

access revenues – some $6-billion – represented excess profits[37] made possible by the absence of any significant competition for these services and by FCC policies that disregard the RBOCs' monopoly status and permit them to price these services outside of a regulatory framework intended to ensure just, reasonable and nondiscriminatory rates.[38] This sustained overpricing of special access creates a "deadweight loss" to the US economy that undermines its overall efficiency and competitiveness. While each individual impact, viewed in isolation, may be small, in aggregate the economywide impact is many multiples of the excessive monopoly profit levels that the incumbent carriers are generating though their monopoly control of the special access market.

It is possible to model the macroeconomic effects of such overpricing and, in fact, AT&T, prior to its acquisition by SBC, had done just that. In 2003, AT&T commissioned a detailed macroeconomic study[39] that found that restoring prices for enterprise broadband last-mile facilities to competitive levels would, over three years, result in $14.5-billion in economic growth and the creation of 132,000 jobs across the US economy. We updated the AT&T Study in 2007 to give effect to both the higher special access profit levels and the significant growth in

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[37] "Excess profits," sometimes referred to as "monopoly profits" or "monopoly rents," represent profits in excess of what can reasonably be expected to arise under competitive market conditions. Economic regulation of dominant telecom carriers – whether focused upon profit levels ("rate of return regulation") or price levels ("price cap regulation") is intended to simulate such competitive market conditions in circumstances where economic conditions make the development of a competitive market unlikely or highly inefficient. We use the term "excess profits" here to refer to earnings in excess of the interstate rate of return last-authorized by the FCC. This occurred some twenty years ago – in 1990 – where the Commission set the authorized rate of return at 11.25%. *Represcribing the Authorized Rate of Return for Interstate Services of Local Exchange Carriers*, CC Docket No. 89-624, Order, FCC No. 90-315, 5 FCC Rcd 7507 (1990). That rate was intended to be a proxy for what the RBOC could be expected to earn in a market where its rates were constrained by competition, based on then-current market conditions (including capital costs). In fact, at the time the 11.25% rate was set, market interest rates were considerably higher than they are today. Considering that the most recently authorized rate of return was adopted in 1990 at a time when the prime rate was 10% and the 10-year US Treasury Bond rate was 8.89% (September 1990), competition-constrained earnings could be expected to be much lower – so our use of the 11.25% return level in estimating a reduction in prices is quite conservative. Today, those rates are both under 3.5% (December 10, 2009). Federal Reserve Board, *Statistics: Releases and Historical Data*, http://www.federalreserve.gov/releases/h15/data.htm#fn3 , (accessed December 14, 2009). If the same criteria for defining the "authorized rate of return" surrogate for competitive earnings levels were applied under today's capital market conditions, the level would likely be several percentage points lower than 11.25%, and the amount of "excess profits" would be several billion dollars higher than the $6-billion estimate given here.

[38] Lee L. Selwyn and Helen E. Golding, *Avoiding the Missteps Made South of the Border: Learning from the US Experience with Competitive Telecom Policy*, August 2006 (Appendix A to August 16, 2006 Comments of MTS Allstream Inc. in response to Canada Gazette Part I, *Government's Proposed Order under Section 8 of the Telecommunications Act – Policy Direction to the Canadian Radio-television and Telecommunications Commission*. Also submitted as Appendix A, Attachment 2 to the Evidence of MTS Allstream Inc., filed March 15, 2007, in response to Telecom Public Notice CRTC 2006-14.

[39] Paul N. Rappoport et al, *Macroeconomic Benefits from a Reduction in Special Access Prices*, June 12, 2003 ("AT&T Study"). *Ex parte* Submission of the Special Access Reform Coalition (SPARC) in *AT&T Corp. Petition for Rulemaking to Reform Regulation of Incumbent Local Exchange Carrier Rates For Interstate Special Access Services*, RM Docket No. 10593 ("AT&T Study").

special access demand that had occurred in the four years following the completion of the original AT&T Study. The updated study projected that, in 2007 alone, the benefit to the US economy from eliminating the (then extant) $5-billion in excess special access prices that businesses economywide had paid to the RBOCs would have produced an additional 95,000 jobs and $17.2-billion in GDP.[40] Looking out two additional years (through 2009, inclusive), the updated study estimated that reversing the inefficiencies arising from the excessive special access rate levels would have translated to 234,000 new jobs and additional GDP growth in the range of $66-billion.[41]

[40] Lee L. Selwyn, Susan M. Gately, Helen E. Golding, Colin B. Weir, *Special Access Overpricing and the US Economy: How Unchecked RBOC Market Power is Costing US Jobs and Impairing US Competitiveness*, August 2007, submitted by the Ad Hoc Telecommunications Users Committee in WC Docket No. 05-25, Special Access Rulemaking ("ETI 2007 Special Access Report").
[41] *Id*.

3 Conclusion

The preamble to the 1996 federal Telecommunications Act describes the legislation as "An Act to promote competition and reduce regulation in order to secure lower prices and higher quality services for American telecommunications consumers and encourage the rapid deployment of new telecommunications technologies."[42] In crafting this legislation, Congress clearly understood that replication of the incumbents' extensive and ubiquitous networks by entrants was not even possible in the short run and was not particularly efficient or practical even in the long run. At the same time, Congress was under no illusion that the incumbent carriers would voluntarily open their networks and share their network resources with rival firms, and on that basis imposed a series of specific duties upon incumbent local carriers both as to the availability and cost to entrants of utilizing incumbent network elements to enter the local telecom market and to offer services to customers. The FCC was directed to – and did – adopt detailed regulations aimed at assuring that such access was made available at forward-looking, cost-based wholesale prices.

Presented with these Congressionally-mandated opportunities to enter the local telecom market and to compete with incumbent carriers using the incumbent carriers' own network facilities, rival competitive local exchange carriers obtained capital and developed and pursued business models premised upon their ability to combine their own facilities with those obtained from the incumbents. In the five years immediately following TA96's adoption, CLECs invested some $125-billion in competing telecom facilities and business resources to support their entry. ILECs too were compelled to invest in new facilities to respond to these competitive inroads. Competition flourished, innovation exploded, and price levels fell – *precisely what Congress had intended and expected.*

But after 2001, the FCC commenced undoing much of what the agency had accomplished in the immediate post-TA96 period. Regulated wholesale rates were replaced by "market-based" rates that appear to have been nothing more than take it or leave it prices dictated by the dominant incumbents rather than "negotiated" between the ILECs and their CLEC rivals. Entrants' ability to compete using ILEC facilities was all but shut down, and bankruptcies and large-scale market exits became all too frequent.

Competition not only serves the overarching Congressional goals for the 1996 legislation, it also promotes investment, employment, and serves to stimulate economic activity generally. There can be no doubt that entrants' ability to obtain access to ILEC facilities and to utilize those facilities to compete with the ILECs in downstream markets drives the competitors' own

[42] Preamble, *Telecommunications Act of `1996,* P. L. 104-104

facilities investments. Moreover, the presence of robust competition and the challenges that such competition presents to incumbents forces incumbents to escalate their own investment programs as well. Policies that frustrate entry serve to create complacency among incumbents, affording them with little incentive to take risks, increase their efficiency, bring innovative services to market, and to invest in their networks.

The economic gains in terms of investment, employment, innovation, and national competitiveness that will flow from a reinstatement of the successful regulatory regime under which competition flourished in the late 1990s should be beyond dispute. The FCC should act – and act quickly – to reverse the failed policies of the past decade and get the US telecommunications industry moving forward once again.

Appendix A | A Brief Tutorial on the Competitive Entry Paths Envisioned in TA96

In 1996, the US Congress passed the *Telecommunications Act of 1996* ("TA96"), a key goal of which was to promote and facilitate the development of competition in local telephone and access markets. Previously, local exchange competition was either prohibited outright or (where permitted in some states) was frustrated by the inability of would-be entrants to interconnect with the dominant incumbents. TA96 barred state regulators from restricting competitive entry in the local telephone market, but beyond merely making local competition *possible* as a legal matter, the legislation included a number of measures designed specifically to *facilitate and encourage* entry with the expectation that increased competition and reduced regulation would work to "secure lower prices and higher quality services for American telecommunications consumers and encourage the rapid deployment of new telecommunications technologies."[43]

The US Congress recognized that in order for robust local exchange competition to arise, it must be feasible for multiple competitive local exchange carriers ("CLECs") to enter the market and to sustain and expand their market presence. Congress also recognized, however, that replication of the incumbent carriers' installed base of network facilities would require enormous infusions of capital and a protracted time frame to accomplish, and that in many cases such replication would be so inefficient that it would be unlikely ever to occur. Accordingly, TA96 created three separate, but not mutually exclusive, paths by which a CLEC could gain entry into the local market:

(1) *Facilities-based entry*. An entrant could acquire and construct its own transmission and switching facilities, and be assured the right to interconnect these to the incumbents' networks.[44] Facilities-based entry gives the CLEC the greatest control of its network and to control costs – once it can justify the large up-front investment that is required. However, facilities-based entry involves high fixed costs the recovery of which requires that a relatively large volume of business (i.e., revenue) be derived from such facilities.

Because an entrant will typically serve only a small fraction of the total market, the *unit cost* to serve each individual customer will often exceed – and sometimes by a considerable amount – the incumbent's per-customer unit cost. In many situations, the level of revenue potentially available

[43] Preamble, *Telecommunications Act of 1996,* P.L. 104-104.
[44] 47 U.S.C. §251(c)(2)

from that relatively small portion of the market that an entrant can reasonable expect to capture over a given route may be insufficient to justify the cost of an overbuild of the incumbent's existing network. For this reason, TA96 created two alternative means by which the CLEC can provide local service using the incumbent's facilities – by leasing individual network components ("unbundled network elements") or by purchasing a total service for resale to retail customers.

(2) *Unbundled Network Elements ("UNEs").* Competitive carriers could lease, on a wholesale basis, individual components ("elements") of the incumbents' network and combine them with the competitor's own facilities or with other unbundled elements, to form a complete service that the competitor could market to its retail customers.[45] TA96 required incumbents to price these elements at cost, including a reasonable profit.

Because it takes time to construct a network, even where such investment can be justified economically, *leasing unbundled network elements* could be used to complement the CLEC's facilities, enabling it to offer service across a much larger geographic footprint than would be possible if it were confined solely to its own network assets. Where CLEC facility overbuilds would be uneconomic, the availability of UNEs leased from the incumbent would make competition feasible. Moreover, demanding that a CLEC deploy facilities when it is uneconomic to do so benefits neither the CLEC nor the ILEC. When the ILEC's existing network has all of the capacity required to serve the total demand (its own plus CLECs'), *requiring* the construction of redundant facilities through a CLEC overbuild creates a situation in which neither network is likely to be deployed in an economically efficient manner. To undermine the economic viability of both ILEC and CLEC investments in this manner is clearly not in the public interest.

(3) *Total Service Resale ("TSR").* Any service that the incumbent offered on a retail basis could be purchased – stripped of its retail functions – at a discount that reflected the incumbent's avoided retailing costs. The competitor could then rebrand the service and market it to its own retail customers.[46] This approach offered the CLEC the least control of its network and costs, but had the advantage of permitting more rapid and flexible expansion, with minimal investment.

Each competitive path presented the entrants with different economic challenges and opportunities. Importantly – and quite appropriately – *TA96 did not contain any preference or predisposition favoring one method of competitive entry over the others*; it left the choice of the optimal business model or entry strategy to each CLEC. Moreover, UNEs and TSR were never envisioned as "transitional" devices that would be phased out once the CLECs had an opportunity to deploy their own facilities. Instead, the continued use of the incumbents' networks was seen as playing a critical role in promoting *and sustaining* local competition on a permanent basis.[47]

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[45] 47 U.S.C. §251(c)(3)

[46] 47 U.S.C. §251(c)(4)

[47] Non-facilities based business models are the norm in most industries, not the exception. For example, in wireless, non-facilities-based retail-level competition offers important benefits in terms of expanded choice, product innovation, and market discipline. Retailing activities may represent as much as 17-19% of an incumbent local telco's costs; even if limited solely to retailing activities, competition can produce significant consumer benefits by exploiting opportunities to increase

Importantly, each of the two wholesale approaches was designed to be fully compensatory to the ILEC.

As with most laws, however, the 1996 Telecommunications Act's success was dependent upon its implementation. Initially, the FCC took great pains to adopt regulations supportive of the pro-competitive provisions in the Act.[48] The U.S. Supreme Court upheld the progressive incremental cost methodology ("Total Element Long Run Incremental Cost" or "TELRIC") that the FCC had adopted as the cost-based pricing standard for unbundled network elements.[49] As we discuss in the body of the paper, the early implementation of TA96 was followed by a period of robust competitive growth by CLECs and significant investment by these companies in their networks.

The three entry paths specifically enumerated in TA96 supplemented the use of more expensive, but still useful, rate regulated dedicated special access services by competitors that had been available since 1984.[50] The use of special access services represented an entry path similar to that described for UNE elements above – allowing competitors to complement facilities they built on their or in some cases to provide service entirely on a resold basis. Unlike UNEs, however, special access prices have never been set at the forward-looking cost levels designed to emulate competitive market price levels – rather they were, at least until the early 2000's when pricing flexibility became operative, subject to price caps regulation and annual price caps price adjustments that resulted in price levels much higher than those available for UNEs.[51]

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retailing efficiency overall, and by introducing innovating service packages and pricing. The existence of competition at the retail level can help to stimulate additional facilities-based entry as well, affording nascent wholesale carriers with access to an established retail distribution channel that would otherwise be unavailable if all telecom retail activities were confined to vertically integrated incumbents and facilities-based CLECs.

[48] *Implementation of the Local Competition Provisions in the Telecommunications Act of 1996*, Interconnection between Local Exchange Carriers and Commercial Mobile Radio Service Providers, CC Docket Nos. 96-98, 96-185, *First Report and Order*, 11 FCC Rcd 15499 (1996) ("*Local Competition Order*").

[49] Verizon Communications Inc. V. FCC (00-511) 535 U.S. 467 (2002) 219 F.3d 744, affirmed in part, reversed in part, and remanded.

[50] Special access was created as part of the FCC's original access charge regime in 1984.

[51] Today, while some services remain available to competitors as special access (albeit with no ceiling on the prices charged by the ILECs in over half the country) many categories of service (packet-based services like Ethernet and high capacity services at the OC-level) are no longer classified as special access, and as such, there is no guaranteed availability to wholesale customers.

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