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Investment Incentives and Local Competition at the FCC

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LOCAL COMPETITION AT THE FCC**

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Introduction

This paper summarizes parts of a broader analysis of the Federal Communications Commission's implementation of a core feature of the Telecommunications Act of 1996 in which Congress directed the Commission to promote investment and innovation in telecommunications networks and services.

We begin with a discussion of the background and goals of the 1996 Act as a predicate to evaluating pivotal Commission rulemakings in the context of the statutory investment promotion standard. Review of the rulemakings indicates that the Commission has not specifically addressed requirements for meeting the statutory admonition to foster investment, but has instead assumed that promotion of *competition* alone is sufficient to ensure timely, reasonable, and high levels of infrastructure investment in the telecommunications services sector.¹ We find a lack of congruence between FCC rules designed to promote *competition* and those designed to encourage investment and

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¹ We italicize the term competition when in the context of the FCC actions to highlight the fact that the term is used in a variety of ways in the orders; that it is not defined so that the reader can determine what is meant; and, finally, that the character of *competition* conceived and promoted by the Commission's implementation of the Act is one of a kind from several alternative market structures and anticipated market processes. We will have more to say on that below.

innovation as required by the Act. We report briefly on the large and growing literature that specifically addresses links between alternative regulatory constraints and telecommunications investment, then conclude by suggesting ways the next Administration and new telecommunications policy leadership might address past and ongoing deficiencies.

Telecommunications Act of 1996 - Background

The Telecommunications Act of 1996 (1996 Act) followed two decades of Congressional review of the Communications Act of 1934 and debate over how to best modify it. Debate reflected bipartisan recognition of the need to conform national telecommunications policy with the enormous technological and economic change driving these markets since the old law was passed during the Great Depression.

By 1996 the FCC had in the preceding three decades morphed its application of the 1934 Act from a restrictive orientation of monopoly protection and regulation to one motivated by a growing reliance on competition in less regulated markets. Rule changes involving promotion of competition, deregulation of existing markets, and regulatory forbearance of new firms and services were made under statutory authority of an Act intended initially and applied for decades to protect and pervasively regulate firms with near-monopoly market power. The process of opening markets to new firms and allowing them to compete on an unregulated basis, while carving out and exempting some markets entirely from regulation, was slow and done very much on an ad hoc basis. Uncertain of its statutory authority, faced with strong political pressures from defenders of the status quo and sensitive to administrative procedural requirements, the FCC was obliged to implement reform on a piecemeal, literally rule-by-rule basis.

The pace of regulatory reform was slowed and national policy rendered even more uncertain and less responsive to Congressional will by the growing role of the courts in deciding fundamental questions at the heart of telecommunications policy. The Judicial role was expanded and deepened by two forces. First, virtually all of the FCC's major deregulatory, market-oriented decisions were subject to well-reasoned legal challenges. Defenders of the status quo cited statutory language and case law the agency had used for decades to foster and regulate monopolies. Secondly, fundamental questions about market and corporate structure, regulation and competition in telecommunications markets were increasingly being decided by a single judge, staffed *de facto* by a large and growing antitrust division of the Department of Justice, under power conveyed by the Judgment modifying the 1956 AT&T Consent Decree.

Notwithstanding broad-based political support for increasing competitive market forces and forbearing regulation, the framework for competition was developing spastically, increasingly according to rules set forth by the courts and, to the dismay of many of its prominent members, outside Congress' ability to control, influence or even adequately to oversee. Regulatory and legal delay and uncertainty translated to mounting frustration of the wishes of both suppliers and consumers of new telecommunications services. Another byproduct was the institutional drag on the adoption of new technology and growing barriers to investment and risk taking by entrants and incumbents alike. The result was

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denial to consumers of much of the new, digital abundance promised by the technology and political speechwriters.

Goals of the 1996 Act

An important political goal for most members in 1996 was to restore Congress to its place as the author and arbiter of national telecommunications policy by recapturing that position from the FCC and the Judiciary. Notwithstanding a handful of modest amendments in the interim, Congress last set out a national telecommunications policy in 1934 - before over-the-air and cable television, microwave transmission, satellites, digital transmissions and packet switching, cellular telephones, and almost sixty years before the Internet exploded into US households. The 1996 Act was also strongly motivated by the political leadership's recognition of telecommunications networks as platforms and drivers for a host of New Economy markets and its desire to encourage higher, sustainable levels of investment in the telecommunications sector and in those supplying and drawing services from it. Regulatory delay and uncertainty were creating more of the same in boardrooms and management suites as firms struggled to identify regulatory risks and to understand their impacts on returns from investing in new technologies. The palpable policy drag on private capital formation was especially destructive in the business sector where users and managers knew well the capability of the technology and lamented the shortfall reflected in carrier offerings.

Discussions surrounding the 1996 Act commonly referred to Information Superhighways, building a new national information infrastructure, accelerating the next generation of broadband and interactive services, providing universal Internet access and other policy objectives whose realization required commitment of enormous amounts of new risk capital to the sector.

Reflecting these concerns, the report of the Conference Committee convened to reconcile differences in the House and Senate versions set out a clear statement of purpose:

...provide for a pro-competitive, deregulatory national policy framework designed to accelerate rapidly private sector deployment of advanced telecommunications and information technologies and services to all Americans.²

In this construction of national policy, infrastructure investment takes its place as one of four discrete goals included in the Act's broad purposes-increased competition, less regulation, heightened investment (deployment of advanced telecommunications and information technologies), and universal service. The 1996 Act signed by the President carried over the investment goal by setting forth in Section 706 (Advanced

² Conference Report on S 652, "The Telecommunications Act of 1996", Regulation, Economics and Law Text, no. 22, Bureau of National Affairs, Inc. Washington, DC, M-1, February 2, 1996 (As printed in the Congressional Record.)

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Telecommunications Incentives) clear provisions requiring the FCC to encourage development of investment supporting advanced telecommunications services. Specifically:

The Commission and each state commission with regulatory jurisdiction over telecommunications service *shall encourage the deployment on a reasonable and timely basis of advanced telecommunications capability...by utilizing...price cap regulation, regulatory forbearance, measures that promote competition in the local telecommunications market, or other regulating methods that remove barriers to infrastructure investment.*³ (Emphasis added)

The meaning of Section 706 is plain. The FCC and state regulators shall promote investment and innovation in new telecommunications networks and services. While the language suggests alternative means for doing so, it clearly states the ends to which those means are to be applied: remove barriers to network investment. Doing so requires the FCC to understand the impact of all of its decisions on investment, which in turn requires it to understand fully what drives investment in advanced telecommunications capability in the market place.

Congress was joined by the Administration in support of promoting investment. In the message to accompany his signing the Bill, the President emphasized the Administration's intent to stimulate investment as the first among several expectations of the new Act:

For the past three years, my Administration has promoted the enactment of a telecommunications reform bill to *stimulate investment*, promote competition, provide access for all citizens to Information Superhighway, [and] strengthen universal service. With this legislation today we are building the Information Superhighway that will lead all Americans into a more prosperous future. (emphasis added)

Thus, the Clinton Administration expected the Act to lead to promotion of network investments and thereby to complement its other initiatives to grow the "Information Superhighway".

The Administration's second regulatory reform goal was to "promote competition". The dual policy goals of stimulating investment and promoting competition, along with a third

³ Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat.56 (1996 Act), codified at U.S.C. paras. 151 et. seq. See specifically Section 706 - Advanced Telecommunications Incentives.

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- ensuring "universal" and equal access to the networks of the future-was shared by most members on Capitol Hill. In reasserting its role as the architect of national telecommunications policy, Congress extended its 1934 directive to make services widely available to all US citizens. There was widespread Congressional support for expanding universal service programs in rural areas, to the nation's schools and for lower income citizens.

There was less consensus on the fourth goal commonly ascribed to the Act-"regulatory forbearance" or deregulation-both in terms of its overall importance and how to implement it. Many policy advocates and members of Congress believed that reducing the government's role in telecommunications markets ought to be a principal policy objective and that doing so would lead to greater investment. However, general agreement on the principle of deregulation broke down in considering the details of whom should be deregulated, how and when. The strongest consensus is reflected in agreement not to extend the full regulatory regime designed for incumbents to new entrants into previously monopolized markets (competitors with cable and telephone companies) and to forebear extension of full-scale regulation to new technologies (wireless telephony, satellites and, most importantly, anything arguably related to the Internet). That consensus evaporated in the heat of debate over changing regulation of incumbent firms with diminishing market power in circumstances where the provable benefits of rule changes did not clearly exceed their potential costs.

Conflicts among Goals

Both the law and the debates surrounding its enactment reveal significant conflicts among objectives and, frequently, in the means prescribed for achieving them. For example, the universal service objective and the means set out for its pursuit may and do conflict with goals of promoting competition or encouraging investment. Promoting universal service has become synonymous with maintaining sub-cost rates for making local connections, while other rates are kept higher, which discourages demand and investment, in order to provide support. Below cost rates encourage households to subscribe and thereby support the universal service objective. Rates below costs are a barrier to investment by both incumbents and entrants-an outcome that discourages capital formation and undermines the viability of local competition. An entrant into the local services' market must compete against the subsidized rate, not the cost achieved by the incumbent. The entrants' technology and management skills must be good enough to beat both the incumbent and the government's subsidy program.

Trade-offs may also be required among the goals of deregulation, promotion of competition and competitors, and fostering investment. Less regulation of incumbents arguably would encourage incumbents to invest. But, the very same reduction in regulation would reduce the incumbents' handicap and permit them to be stronger competitors and temper the growth of entrants. Incumbent LEC's urge less regulation as a means reducing regulatory barriers to investment and delivery of new services to the public. Opponents

inveigh against "deregulating monopolies". Of course both sides have a point, but from different perspectives. The challenge is to find the correct balance and to make the difficult tradeoffs among conflicting goals.

By handing over for implementation a law with objectives reflecting substantial unresolved conflict among its members, Congress dealt the FCC a very tough regulatory hand to play. After two decades of debate, members knew well all the competing interests and were under enormous pressure to pass a law that placated contending interests among their supporters-some of whom arguably possessed quasi-veto power. The result was a law that could support rival stakeholder claims to victory in the long legislative battle. It comes then as no surprise that the Act's goals are uneasy companions and that the Commission was left with the chore of making high stakes trade-offs. Congress also left the FCC with substantial discretion to do so.⁴

The FCC Local Competition Order and Investment Incentives

To implement the new Act, the FCC focused first and most intensively on fashioning rates and other terms governing new entrants' interconnection and use of incumbent local networks. The Commission made explicit that it regarded its responsibilities under the new Act largely in terms of fostering competition and in the process made clear, if not as explicitly, that infrastructure investment was of less direct concern.⁵

The Commission declared on the first page of its first major order that the Act's telephony requirements were threefold: a) open local markets to competition, b) rationalize competition in long distance markets via access charge reform and c) reform universal service rules in consonance with increased competition.⁶ The Commission elevated those objectives to what it called the "Competition Trilogy" and declared that only when all parts of the trilogy are complete would the task of adjusting the regulatory framework to fully competitive markets be finished. FCC exclusion of investment as a discrete goal of its

⁴ Former FCC Chairman Reed Hundt has written an insider's view of the pressures at work on both the Congress and the FCC and how key decisions implementing the Act were made. See, Reed E. Hundt, *YOU SAY YOU WANT A REVOLUTION: A STORY OF INFORMATION AGE POLITICS*, Yale University Press, New Haven, (2000). Some have argued, even before reading Chairman Hundt's book, and more forcefully afterward, that Congress' effort to reassert control of telecommunications policy actually resulted in empowering even further the FCC and the Courts.

⁵ To identify the Commission's sense of its responsibility to encourage investment and the means it adopted to do so, we have screened most of the principal potential source documents, including major notices, reports and orders (in dockets related to interconnection, universal service, access charges - the recent CALLS decision in particular, and spectrum auctions), special reports (on advanced services, cable services, wireless services and the Internet), as well as assorted speeches by senior staff and individual Commissioners. We are confident that we have captured the essence of the Commission goals, perspectives and reasoning in implementing the major provisions of the Act. Chairman Hundt's book (note 4 above) was also invaluable.

⁶ First Report and Order, Implementation of the Local Competition Provisions of the Telecommunications Act of 1996, CC Docket No. 96-98, Dec. 8, 1996, p. 7. (Local Competition Order). For detailed summary of the FCC's approach in implementing the 1996 Act by a senior FCC staff member, See Gregory L. Rosston, *The 1996 Telecommunications Act Trilogy*, 5 Media L. & Pol'y 1, (Winter 1996.)

implementation of the Act is notable and puzzling, given the consensus in Congress and the Administration of its importance. It seems likely that a combination of factors were at work. Promotion of competition and universal service were at the heart of the Act and enjoyed the greatest consensus. They were also easily addressable; the Commission had staff interested and experienced in dealing with them; and, their means for attainment were detailed by Congress. Investment "policy" differed on each of these accounts. It was not easily addressable, the Commission had little previous experience and expertise in developing it and Congress gave little specific guidance. While each of these factors came into play, the principal reason the Commission did not address investment as a discrete goal appears to be its belief that opening markets to new entry was sufficient to meet the Act's requirements that it encourage investment in advanced telecommunications capability.⁷ While it nowhere explicitly states as much, the Commission appeared to believe, and certainly proceeded as if, the policy program it developed to maximize the rate of development of competition in retail markets for telecommunications services would meet the statutory requirement of insuring reasonable and timely investment in advanced telecommunications systems.

In explaining its local competition rules, the Commission emphasized the three possible paths of entry into local markets previously debated in Congress - construction of new network facilities via new capital formation, resale of services from bulk capacity leased from incumbent network operators and the hybrid case, some facilities investment combined with use of some unbundled network components obtained from incumbents - the so-called UNE platform. After detailed conjectures about potential entry strategies, the Commission declared that Section 251 of the Act expressed no preference among these three paths and that "...our obligation in this proceeding is to establish rules that will ensure that all pro-competitive entry strategies may be explored."⁸

While it is correct that section 251 provides no such direction, the Commission's focus on that language obstructed its view of language in section 706 clearly directing it to remove (and presumably not to erect) regulatory barriers to infrastructure investment. The Commission rationalized its failure to analyze the investment impacts of its rules by focusing on the lack of direction in section 251, while ignoring clear direction elsewhere in the Act to weigh such impacts. Even more puzzling was its implicit denial of any cause and effect relationship between its local competition rules and private investment decisions. It advised tersely: "As to success or failure [of any entry strategy], we look to the market, not regulation, for the answer."⁹ The logic of that observation suggests that the FCC did not

⁷ Section 706 (a) directs the Commission to encourage investment "...by utilizing, in a manner consistent with the public interest, convenience and necessity, price cap regulation, regulatory forbearance, measures that promote competition, or other regulating methods that remove barriers to infrastructure investment. Promoting competition is one of the means set out by Congress, but the inclusion of others makes clear that Congress regarded competition as necessary, but not sufficient.

⁸ Local Competition Order, p. 11.

⁹ The Commission's discussion in the sections on UNEs and rates for interconnection suggests considerable concern for static economic efficiency of two kinds - what economists call "allocative" efficiency from having

recognize the potential impact of its rules on the returns to any particular investment program or strategy. The FCC might "look to the market for the answer", but make no mistake about it, the market was looked first to the FCC's rules to help determine which path would be the most successful.

Thus, in the introduction to its first major order under the new law, the Commission disclaimed any obligation or intention to consider directly the effect of its interconnection terms and rates on new capital formation and implied the absence of any such linkage. It did so despite the fact that several respondents to the initial notice had filled the record with strong contentions to the contrary. Several argued with varying degrees of evidentiary support that a) the interconnection rules would have a significant impact on the level and composition of capital formation and the availability of advanced telecommunications services and b) the Commission was legally obliged to consider those effects and reflect them in the final rules. Whether they were right or wrong, the Commission chose not to evaluate or address those contentions.

The Commission's analysis of the effect of its local competition rules is dominated by discussion of the definition of interconnection services and their cost basis for rate-making purposes. The Local Competition Order first establishes terms for interconnection, including the definition and number of unbundled network elements (UNE's) to be made available, before turning to pricing those elements. Most of the discussion of UNE pricing deals with old cost allocation issues debated previously for years in rate making proceedings - the meaning of long run incremental cost, what to include in it, how to measure it, whether incumbents are entitled to recover book costs and the implications either way, the treatment of universal service charges, the size and difficulty of allocating joint and common costs.

Notwithstanding the implications of UNE definition and pricing for incumbent and entrant investment incentives, the Commission did not address investment in the context of any of the myriad rules it was establishing with respect to interconnection terms, the number and definition of unbundled elements, collocation, resale, takings issues, legal and jurisdictional questions (including powers left to state regulators) and others.

Predictably, incumbent local exchange companies called attention to several features of the proposed unbundling, resale and pricing scheme and claimed that these would diminish their investment incentives - added risk, uncertainty about capital recovery, negative effects on earnings (reasonableness of profit) and prospects for future growth. Just as predictably, opponents offered counter arguments. But, since the Commission did

rates reflect the "right" cost concept and so-called "X-efficiency" which requires that the cost basis be the lowest possible consistent with current technology and administrative efficiency. However, by ignoring the longer term resource allocation implications associated with the level and composition of investment, the Commission's economic analysis was at least partially misdirected and did not fully comprehend the full economic welfare impacts of the decision. Very much to this point, Professor Scherer concluded his review of antitrust policy and economic efficiency as follows: "We know that many discussions of antitrust policy and efficiency have violated the New Testament injunction against beholding the mote and ignoring the beam. X-efficiency is much more important quantitatively than allocative efficiency, and dynamic efficiency is almost surely even more important. F.M. Scherer, *Antitrust, Efficiency and Progress*, 62 N.Y.U.L.REV.1018, (November 1987).

not solicit such analysis, the claims and counterclaims do not adequately address links between interconnections rules and investment questions; and, in any event, the FCC ignored what was proffered. It reiterated the contending conclusions, without analyzing the basis for either, then cited its authority to do so and moved with dispatch to prescribe a cost basis of its own invention - total element long run incremental costs (TELRIC) as the basis for interconnection rates.¹⁰

The FCC's discussion of the investment impact of TELRIC is short, sweet and unequivocal: "We believe that the prices that potential entrants pay for these elements should reflect forward-looking costs in order to *encourage efficient levels of investment and entry.*"¹¹ Given the focus of its previous discussion and its notable lack of investment analysis, the Commission's conclusion that TELRIC based interconnection rates will lead to "efficient" investment is puzzling and troubling. To support that conclusion, the Commission might usefully have a) indicated what it meant by "efficient levels of investment", b) discussed generally some of the determinants of investment, efficient or otherwise and c) linked the incentives in TELRIC rates to those determinants. The obligation to do so seems especially strong in view of the clear requirements of the Act and the fact that there was substantial analysis in the record submitted by parties contending just the opposite - that TELRIC as initially proposed by the Commission would have serious detrimental effects on investment incentives.¹²

While generally ignoring regulatory (dis)incentives to invest, the Commission did concede that some versions of TELRIC might suppress investment by entrants by encouraging them to utilize the UNE platform and forego new capital formation.¹³ While

¹⁰ The Commission's discussion in the sections on UNEs and rates for interconnection suggests considerable concern for static economic efficiency of two kinds - what economists call "allocative" efficiency from having rates reflect the "right" cost concept and so-called "X-efficiency" which requires that the cost basis be the lowest possible consistent with current technology and administrative efficiency. However, by ignoring the longer term resource allocation implications associated with the level and composition of investment, the Commission's economic analysis was at least partially misdirected and did not fully comprehend the full economic welfare impacts of the decision. Very much to this point, Professor Scherer concluded his review of antitrust policy and economic efficiency as follows: "We know that many discussions of antitrust policy and efficiency have violated the New Testament injunction against beholding the mote and ignoring the beam. X-efficiency is much more important quantitatively than allocative efficiency, and dynamic efficiency is almost surely even more important. F.M. Scherer, *Antitrust, Efficiency and Progress*, 62 N.Y.U.L.REV.1018, (November 1987).

¹¹ Local Competition Order, 329, emphasis added. The reference to efficient levels of investment has no foundation anywhere in the order.

¹² See, the Commission's summary of the pleadings on the effect of TELRIC on efficiency and investment in the Local Competition Order at paras. 630-652.

¹³ Thus, in discussing alternative constructions of the meaning of "forward looking", in the favored cost standard, "forward looking TELRIC", the Commission considered three options for the assumed basis of forward looking costs: a) the most efficient network architecture, sizing, technology and operating decisions that are operationally feasible and currently available to the industry; b) existing network design technology that are currently available; and c) the most efficient technology deployed [anywhere] in the incumbent LEC's current wire center operations. That is the cost of the most efficient network conceivable from current technology, the costs of the networks actually being used to provide UNEs or the cost of networks using the most efficient technology being used in some where by some incumbent local exchange company. (paras. 684-5 at 333).

discussing a costing approach completely removed from the costs of current networks, the Commission observed:

This approach, however, may discourage facilities-based competition by new entrants because new entrants can use the incumbent LEC's existing network based on the cost of a hypothetical least-cost, most efficient network.¹⁴

Its reasoning was correct. New entrants would very likely be discouraged from bearing the risk of new capital formation, if entrants were allowed to buy network elements at costs reflecting some non-existent, hypothetical, ideal network that are well below the costs that would be incurred in connection with entrants' investment by in their own facilities. But, having correctly and clearly stated a key element of the underlying economics of firms' decisions to "build or buy" facilities, the Commission forthwith ignores its own analysis and its clear relevance to the investment goals of the Act by rationalizing its decision to base forward looking TELRIC rates on *another hypothetical network nowhere in existence*, one using "the most efficient technology being deployed in the incumbent LECs" network.

In short, the Commission declined to consider the effects of its Local Competition rules on investment and innovation in broadband systems as required by specific language in the new law. With one minor exception, it did not even recognize the critical role its interconnection requirements and rates would have on facilities investment by either incumbents or entrants. Instead, the FCC appears to have simply assumed that its rules for promoting competition and a set of rules for promoting investment and innovation are one and the same. We turn now to discussion of this assumption.

Incongruence of Competition Policy and Investment Policy

The Commission neither explains nor expressly states the basis for its presumption that competition policy and investment policy are congruent.¹⁵ It proceeds as if it were so,

¹⁴ See, Local Competition Order, para. 683. It is worth noting as well that, to the extent that this is true, the rules encouraging unbundled network elements not only fail to encourage investment, they also would tend to perpetuate regulation, since the decision to regulate or not turns on market shares and competition at the facilities and wholesale services level, not in the retail services market.

¹⁵ The closest to a "theory of investment" we could find in the Commissions voluminous public documents is a statement in its second report fulfilling its statutory obligation to conduct an inquiry and report to Congress "...whether advanced telecommunications is being deployed to all Americans on a reasonable and timely fashion." There the Commission cites three factors "that appear to be linked to the deployment of advanced telecommunications capability." These are: existence of sufficient demand (as indicated crudely, for example, by population density, per capita incomes and the level of commercial activity); existence of competition among advanced service providers in the locale; and "local efforts, such as community demand aggregation [and] the use of anchor tenants". See, Second 706 Report at p.p. 94-95. We doubt that the Commission intended that as its preferred theory of investment in the sector and would certainly not choose to defend it as such. However,

even though neither economic theory nor available evidence supports the proposition that rules designed to increase competition, alone and without regard to other elements of regulation, will lead to increased investment and innovation as set forth in the 1996 Act.

The FCC's understanding of the relationship seems to derive from a simple, if not articulated, chain of reasoning: Encouraging and enabling entry will lead to added investment by new entrants. That in turn will force incumbents, out of concern for loss of market share, to undertake investments they would otherwise forego. The result: aggressive promotion of competition will lead to increased investment by both entrants and incumbents. The proof: incumbents increased their investment in broadband facilities after the Commission's local competition rulemaking.

While superficially tantalizing, this theory of the linkage between competition and investment is too simple and, if taken literally, quite misleading. The proof suffers from a fundamental logical error.

The economics and finance literature does not give clear guidance on the role of market structure in encouraging either investment or innovation.¹⁶ That is not surprising, given the complexity and uncertainty attending most investment decisions and the relative simplicity and limited information embodied in measures of market structure. Competition matters, but so do other kinds of incentives, as well as opportunity, market demand, risk, regulatory constraints (of the kind imposed by the FCC), and dozens of other economic and financial considerations. The importance of fixed and sunk costs, the age and technological vintage of existing plant, the availability of complementary inputs, expected growth in

it does contain reference to the role of competition and is the most nearly definitive statement we have found.

The evidence cited is not compelling, though. The Commission looked specifically at the rate of investment in five communities. In two of these, it reports the conclusion of what is clearly a casual analysis: "Yet appears that additional competitive providers began deploying advanced telecommunications capability once an initial provider had entered the market." (p. 95)

¹⁶ Space does not permit even a brief summary of the literature on the matter of the relationship between market structure and innovation or market structure and investment. The interested reader might find it helpful to consult one of several good literature reviews that summarize and report anecdotally the broad and rapidly growing field. The following are well known in the field and among the better ones. Each has an excellent bibliography. Morton I. Kamien and Nancy L. Schwartz, *MARKET STRUCTURE AND INNOVATION*, Cambridge University Press, Cambridge, London, New York, (1982). Peter Hall, *INNOVATION, ECONOMICS AND EVOLUTION*, esp. chapter 6, *Innovation, Competition and Market Structure* and the section in the concluding chapter summarizing the main findings of the study, Harvester Wheatsheaf, New York, 1994. Wesley M. Cohen and Richard C. Levin, *EMPIRICAL STUDIES OF INNOVATION AND MARKET STRUCTURE*, in *Handbook of Industrial Organization*, vol. 2, North Holland, Amsterdam, 1989. These and a sample of the references in each confirm that there are no simple relationships between market structure and investment in innovative products and services or productive techniques. While market rivalry matters, it alone is not sufficient inasmuch as numerous other economic factors are at play in the investment decision. An interesting feature of the latest literature on investment and innovation grows out of its reliance on game theory. Much of that literature concludes that the effect of market structure on innovation and investment is simply indeterminate without specifying a long list of assumptions about the firms current circumstances, strategies and expectations, which, we note emphatically, must include substantial consideration of regulation, regulatory risk and regulatory expectations.

demand, existence of regulations that influence expected risks and returns, future options and opportunities, as well as attitudes toward risk. These and numerous other factors are known to influence investment and innovation, even though they have little or no relationship with the degree of entry and growth of competition.¹⁷ The Commission's proof of its theory linking competition and investment confuses serial correlation with causation: "After this, therefore because of this." Other explanations of the increase in incumbent investment are equally attractive in the absence of empirical testing and verification. For example, rather than a response to increased entry and the threat of market share loss, the increase in incumbent investment may have been driven by the same economic and market forces to which entrants were responding and which were not present until after the 1996 Act became law. Until the Internet browser spread to businesses and households, there was little market demand for broadband local distribution facilities for other than voice, which the telephone companies provided, or for video provided by broadcasters and cable companies. The browser created demand for broadband data distribution capabilities - a new demand that surely had an impact on incumbent firms' capital budgeting plans.

Competitive pressure is an important factor underlying the decision of incumbents to invest, but *any and all* sets of rules designed to promote competition will not necessarily boost total investment, and some might diminish it. Investment by entrants may be dampened by the Commission's desire to foster competition in the retail market without regard to whether entry is based on new facilities construction or the UNE platform. The Commission's insistence that it is indifferent to which of the alternative avenues - facilities construction, resale or UNE based entry - new firms utilize and its efforts to make the UNE platform attractive by its definition of UNE's and TELRIC raises questions about whether this particular set of "competition" rules encourages or discourages investment.¹⁸

¹⁷ In looking for determinants of investment, it is instructive to look to the financial literature on the determinants of stock prices (financial investments); capital budgeting models (real investment in plant and equipment); and, to econometric models that attempt to explain, *ex post*, the level of investment in the economy, or in particular sectors. Doing so yields numerous explanatory variables, including expected earnings, expected growth, interest rates, estimates of various kinds of risk, discount rates, time patterns of future payoff streams, the rate of technological change, changes in the level of product/service demand, the price of capital goods, capital durability and equipment replacement cycles, marginal capital/output ratios, the productivity and costs of complementary inputs (labor and materials), and so forth. If there are any common denominators in all these varied determinants of investment they arise in the context of 'expectations' regarding future values of three characteristics of an investment program. These three characteristics - estimates of expected net benefits (measured by profits, earnings or cash flow); and, the risk adjusted cost of the capital required - are represented in one way or another in most asset valuation methods and in most capital budgeting and investment demand models. These characteristics have the added advantage of conforming to our own intuition and commonsense notions of the value of an investment. Value depends on the benefits of the investment, their rate of growth and the amount of risk (of capital loss) investors must bear in order to be eligible for those growing nominal benefits streams. In addition to these traditional discounted cash flow valuation determinants, the regulatory literature has recently bloomed with references and discussion of "real options" (opportunities gained or lost by the decision to invest) as an added determinant. All of these are, of course, influenced by regulations and expectations attributable to those like the FCC's local competition rules.

¹⁸ One analyst concluded: "If implemented in its current form, this order [the Local Competition Order] will likely have serious negative effects on innovation, the introduction of new services and new investment in the

To summarize, the determinants of investment and innovation are complex, highly circumstantial, and by no means exhausted, as the Commission implies, by consideration the level of actual or potential competition. The policy scheme that maximizes the pace of development of retail competition-as the Local Competition Order is designed to do-does not necessarily or even probably lead to the optimal rate of investment and innovation. It may have the opposite effect to the extent it encourages entrants to piggyback on incumbent facilities. While competition may stimulate investment and has done so historically in other markets, competition alone, and in particular the specific brand unleashed by the FCC are not likely to ensure optimal innovation and investment in local telecommunications markets. Theory alone cannot resolve the question. Ultimately the answers must be sought empirically.

Links between Regulation, Investment and Innovation

Understanding the relationship between market structure and investment is critical for evaluating the Commission's discharge of its investment promotional obligations under the 1996 Act. That understanding alone is not sufficient, but it will provide the basis for analyzing further the role of regulation itself, since the rules imposed by the FCC and state regulatory agencies are both drivers and constraints on the conduct of incumbents and entrants. The direct effect of regulation on market conduct is just as important as its indirect effect through market structure. A full appreciation of how to encourage telecommunications investment requires careful consideration of the effect of new rules, but also countless old ones, on the incentives of incumbents and entrants to invest.¹⁹

local telephone network." See, Jerry A. Hausman, *Valuing the Effect of Regulation on New Services in Telecommunications*, Brookings Papers: Microeconomics, 1-54 , (1997), for an elaboration of the theoretical and empirical bases for this conclusion. Recall that the Commission itself made a brief reference to the possibility that entrants would be encouraged by the UNE rules to use incumbent facilities rather than investing in their own. See, discussion above and note 17. For another analysis of the role of "competition" taking issue with the Commission's view, see Glenn A. Woroch, FACILITIES COMPETITION AND LOCAL NETWORK INVESTMENT: THEORY, EVIDENCE AND POLICY IMPLICATIONS, 4 *Industrial and Corporate Change*, 601- 614, (December 1998). Professor Woroch concludes: "Despite the reputed benefits of facilities competition, and its popularity among economists, surprisingly little is known about its relation to firm investment behavior. There is no empirical test to compare investment efficiency in local exchange markets following facilities based entry against investment patterns under the status quo. Moreover the notion that facilities-based competition stimulates investment in the local network has its detractors and their arguments are not without merit." And, while Professor Woroch conjectures that facilities based competition "...adds to industry capital", he concedes that the effect on incumbent investment "...could go in either direction."

¹⁹ In notes 15 through 18 above, we called attention to Academic studies of either a theoretical or empirical nature bearing on the question of the impact of market structure, competition and the form of regulation on investment and innovation. In addition, there have been countless more immediate and direct indicators available to the Commission from reports of securities analysts who review and report on the investment implications of Commissions actions. Credit and equity analysts of the major investment banks followed and reported extensively their view of the investment impacts on publicly traded companies of the 1996 Act and major FCC notices and decisions implementing it. This excellent source of insight and expertise on linkages between regulation and investment has been largely ignored by the Commission. (The sources are too numerous to cite, but the interested reader should go to the web site of any large investment bank and survey

In implementing the Act the Commission might have traversed any one of several alternative regulatory paths - each defined by consideration and analysis of a different set of regulatory obligations, privileges and constraints on incumbents and entrants - if it had regarded its statutory mandate to promote investment and innovation as separate from and equal to its mandates to promote competition and universal service.

For example, it might have issued a notice inquiring about a) the determinants of investment and innovation generally and, more specifically, in the telecommunications equipment and services sector, b) if and how the government's main regulatory programs - variously defined or construed - influence these investment determinants and c) what effects these insights ought to have on the Commission's implementation of the Act's competition, universal service and deregulation mandates.

In keeping with repeated assurances of its desire to insure that its rules are technology neutral and otherwise nondiscriminatory, the Commission might have solicited comments about how pursuit of universal service objectives and assorted market opening-competition promotional regulatory initiatives would impact the incentives to invest a) for different kinds of firms, b) in different technologies, c) in different parts of the country and d) in order to address different market segments. It could have inquired on how to balance the Acts' conflicting goals and specifically solicited comments on how best to trade them off at the margin as a means of maximizing the public interest. Or, the Commission could have inquired about the comparative consumer welfare gains from improved static efficiencies - "getting prices right" - which it emphasized, and the dynamic welfare gains it essentially ignored from longer term efficiencies related to investment and innovation in new production methods and new product and service introductions.

The "public interest" clearly turns on these kinds of issues, but the Commission chose not to open them for inquiry and analysis. Had it done so, it would have been informed of the literature identified above, but it would have also seized the chance to inform its rules by the large and growing literature on linkages between telecommunications regulation and capital formation. The literature linking regulation and investment reports analyses is done in different contexts and for different purposes. Nevertheless, it holds valuable insights germane to the issues addressed by the FCC in 1996. How do we fashion policies that encourage investment or, alternatively, how do we fashion policies encouraging competition, universal service and deregulation, while taking due care that the impact of those rules is to encourage investment, or at a minimum, not discourage it? Several excellent reviews indicate the breadth, depth and diversity of academic scholarship focused on the relationship between investment and the form of regulatory constraint and, more generally, the relationship between particular rules and investment and innovation in the sector. These studies span both theoretical contributions and empirical efforts to measure and quantify specific impacts.²⁰

the available research around the time of key regulatory events.)

²⁰ See, Michael A. Crew and Paul R. Kleindorfer, *Incentive Regulation in the United Kingdom and the United States: Some Lessons*, 9 *Journal of Regulatory Economics*, 211-225 (1996) See also, references there to several

The literature is mixed. Some analyses and analysts support the FCC's general reluctance to recognize ways or take measures to increase the incentives for incumbents to invest and innovate beyond promoting entry and rivalry from new firms. Others support the need to recognize the impact on incumbents' incentives to invest. The best examples of contrasting arguments along those lines were put forth in the context of debates over price cap regulation, but with implications and insights for broader questions about the links between regulation and capital formation addressed in this paper.²¹ The literature also addresses the implications for investment and innovation of fashioning rules that are asymmetric in their application and that provide different incentive structures for different classes of carrier.²²

The point here is simple. A lot is known about the links between regulation and investment and innovation and that work is available for application to the public policy questions and tradeoffs raised by Telecommunications Act of 1996. That is the good news. The not so good news is that most of it has not been considered in the Act's implementation.

Concluding Observations

This paper has addressed how the Commission approached its statutory task of increasing investment and innovation. We have argued that the Commission did not really consider or articulate an investment policy. The actual impacts of the Commission's non-investment policy on investment are properly the subject of another paper. The Commission has twice reviewed the results of its own work in response to Congress'

earlier works addressing the same general issue. Another excellent survey of the literature and a source supporting and elaborating the proposition that the form of regulatory constraint has important effects on investment and innovation independently of any indirect effects of increased competition is: Donald J. Kridel, David E.M. Sappington, *The Effects of Incentive Regulation in the Telecommunications Industry: A Survey*, 9 *Journal of Regulatory Economics*, 269-306 (1996). These are pre-Act publications addressing different issues, but nonetheless indicative of the kinds of information that might well have been, but was not, introduced into the FCC's decision processes as it was implementing the 1996 Act. *See also*, Linda M. Chappell, *THE EFFECTS OF REGULATION ON THE DIFFUSION OF TECHNOLOGICAL INNOVATION IN THE LOCAL TELEPHONE INDUSTRY IN THE UNITED STATES*, A Ph.D. dissertation submitted to the Graduate Faculty of North Carolina State University, 1998).

²¹ *See*, Lee L. Selwyn, *Efficient Public Investment in Telecommunications Infrastructure*, 331-342, 71 *Land Economics*, (August, 1995). The other side of the argument was presented in empirical terms. *See*, Shane Greenstein, Susan McMaster and Pablo Spiller, *The Effect of Incentive Regulation on Infrastructure Modernization: Local Exchange Companies' Deployment of Digital Technology*, 4 *Journal of Economics and Regulatory Strategy*, 187-236 (Summer 1995). This study is concerned specifically with regulatory developments and market circumstances before the Telecommunications Act of 1996. Nevertheless, it is a rich source for references, data, theory and methods for analyzing the relation between government rules that effect earnings, risk and growth prospects and the resulting level and composition of investment - the very questions we believe the FCC ought to have more diligently asked and explored.

²² *See*, Mark Schankerman, *Symmetric Regulation for Competitive Telecommunications*, 8 *Information Economics and Policy*, 3-23, (1996); Sanford V. Berg and Dean Foreman, *Incentive Regulation and Telco Performance: A Primer*, 20 *Telecommunications Policy*, 641-652, (1996), especially the footnotes and Table 1 for references focused on the impact of various regulations on both prices and investment.

direction that it review and report from time to time "whether advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion." If [not], it shall take immediate action by "removing barriers to infrastructure investment and by promoting competition"²³ On both occasions the Commission found its policies promoting competition quite adequate and nothing significant in its rules that rose to the level of a removable "barrier to infrastructure investment."

While the Commission's efforts to ascertain the rate of and composition of investment in broadband infrastructure improved dramatically between the first and second reports, the probative value of its investigation and findings - that all is well, or very nearly so - is undercut by its clear interest in not finding otherwise. But, even more troubling is the failure of the Commission to establish, or even discuss alternatives for, a benchmark for evaluating what constitutes reasonable and timely infrastructure development.

How can regulators guarantee high rates of capital formation and innovation in the sector? The short answer is that they alone cannot. The determinants of investment are quite complex and, to be fair about it, not easy to quantify or generalize. That is especially so among firms in the telecommunications and information technology space whose incentives are shaped not only by FCC regulation, but by the melange of techno-economic forces at work in the New Economy. Regulation matters, but more than regulation is at work.

Satisfying Congress' mandate to eliminate regulatory barriers to investment will not be simple or without controversy. But, neither were the Commission's efforts in the Local Competition Order, or with respect to its efforts to rationalize universal service or access charges. Moreover, concern for encouraging investment is not a new element of US telecommunications policy. Public policy in this country has long recognized the importance of telephone network investment and regulators have put in place complex and detailed regulatory regimes to encourage "universal service", which can be regarded as a special case of a more general investment policy. Policies and regulations at both the federal and state levels promoted, for more than six decades, expansion of the telephone network into poor neighborhoods and homes and into isolated and rural, hard-to-serve areas.

It is important that regulators a) recognize that what they do always matters to investors and some times matters a lot and b) undertake more aggressively to understand more specifically the relationship between rules designed to achieve other goals and their impact on investment and innovation. The result will be to minimize the unwanted and unanticipated investment impacts. In this respect the Commission might begin to build "models" of regulatory impacts on investment that specifically link various types of rules to investment incentives. Great strides in that direction might be made using a fraction of the resources and experience associated with its development of universal service and

²³ See, 1996 Act, Section 706 (b). See also, Federal Communications Commission, *Report on Advanced Telecommunications Capability*, (February 2, 1999) and *Deployment of Advanced Telecommunications Capability: Second Report*, (August, 2000)

TELRIC costing models. Financial engineering and capital budgeting processes within the companies can be identified and modeled. Traditional microeconomic analysis is rich in theorems addressing optimal investment in the face of changes in interest rates, risk, prices of capital good, productivity, and output prices. Traditional stock valuation models provide additional planks - risk, cash flow and growth - in the bridge between regulation, stock prices and capital formation decisions by managers of regulated firms.²⁴ There is very substantial literature available as a platform for building a more complete and reliable understanding of the role of regulation on investment.

We anticipate objections that the linkages between regulatory programs and capital formation are too complex, too hard to pin down, or otherwise too difficult to identify and reflect adequately and fairly in FCC rulemakings. We respond by insisting that these linkages are no more elusive, and perhaps even less so, than those between infrastructure investment and in particular, a variant of *competition* promoted by the Commission in its initial orders.

An important axiom of the policy sciences is that there should be as many policy instruments as policy goals. Having more goals than instruments means we have to trade off and balance among conflicting objectives. There is obvious and frequent conflict among the means for bringing about more competition, universal service, greater investment and deregulation. Promoting competition and expanding, while rationalizing, universal service have taken precedence in the Act's implementation-a fact attributable no doubt to conflicts among goals.

Thus, rather than sacrifice achievement of some goals because the realization may conflict with others, we might usefully look for other ways, for other policy instruments, to encourage investment - affirmatively or by eliminating existing regulatory disincentives - by incumbents and entrants alike. Given the stakes, a flood of such proposals would most likely be forthcoming, should the Commission indicate willingness to consider them seriously. Congress was absolutely correct in identifying regulatory forbearance as way to encourage investment. There are limits to regulation. Regulation cannot force innovation or investment. It can only enable it. Regulators can at best create an environment conducive to risk taking and encourage managers to commit scarce capital. Regulation can and does, however, prevent investment by increasing risk and uncertainty; by restricting and delaying recapture of investment outlays; and, by levying value reducing restrictions imposed in pursuit of other policy goals. Regulatory forbearance might be approached in several ways. The Commission has been quite cautious about not extending traditional regulation to new technologies and new firms that compete with incumbent lines of business. New firms offering Internet related services have been the beneficiary of this reluctance to extend the common carrier regulatory model to new services, but incumbent telephone companies offering the same have not been so fortunate. Unless it is inclined to

²⁴ As a starting point see the matrix relating regulatory programs to impact on risk, return and growth for incumbents and entrants in Larry F. Darby, *Regulation Matters in Investment and Efficiency in Telecommunications*, 1 Telecommunications Report Journal, No. 2 (September/October, 1997), 10.

distort the allocation of investment and favor one technology over another, the FCC will eventually have to reconcile inconsistencies between how it regulates different Internet service platforms - traditional telephone, cable and wireless networks, for example.

Consideration might be given to attaching sunset provisions to new regulations.

There is a ratchet effect in regulatory processes. It is easier to impose regulations and add them, than to delete or relax them. Beneficiaries of regulations come to regard them as property rights and accordingly resist relinquishing associated value. It would be useful to provide some mandatory mechanism for subjecting existing regulations to a systematic cost benefit analysis. Most current rules were put in place without regard to their impact on investment and innovation and probably discourage investment owing to associated real costs of compliance, as well as frequently ignored intangible costs of associated with uncertainty, delay and added risk.

There has been considerable discussion this year in Congress about both the FCC's processes - particularly merger review processes - and its organization. Questions have been raised about the need for fundamental revision of both. As a part of its procedural and organizational review, the next Congress might require the Commission to develop verifiable methods and measures permitting objective valuation of its success in meeting Congressional intention to increase competition; to increase options and lower rates for consumers; to foster innovation and investment; and, to eliminate unnecessary and wasteful regulations. Some of these approaches may be more useful than others. Our purpose is less to urge any one of them, but to start the debate and search for regulatory programs more in keeping with Congress' direction. The new Congress will play a key role in that respect and may need to reassert through active oversight, or refine through additional legislation, the investment goals of the 1996 Act and the regulatory means for achieving them.