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Access to Networks: Economic and Constitutional Connections

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ACCESS TO NETWORKS: ECONOMIC AND CONSTITUTIONAL CONNECTIONS

Daniel F. Spulber[†] & Christopher S. Yoo^{††}

A fundamental transformation is taking place in the basic approach to regulating network industries. Policy makers are in the process of abandoning their century-old commitment to rate regulation in favor of a new regulatory approach known as access regulation. Rather than controlling the price of outputs, the new approach focuses on compelling access to and mandating the price of inputs. Unfortunately, this shift in regulatory policy has not been met with an accompanying shift in the manner in which regulatory authorities regulate prices. Specifically, policy makers have continued to base rates on either historical or replacement cost.

We argue that this fundamental shift in regulatory approach demands an equally fundamental shift in the approach to setting prices. Economic theory suggests that regulatory authorities should base access prices on market prices. In addition, because compelled access to most telecommunications networks requires that competitors be permitted to place equipment on the network owner's property, access requirements constitute physical takings for which market-based compensation must be paid. Although the unavailability of market-based determinants once justified basing prices on some measure of cost, the shift in regulatory policy (especially when combined with the emergence of direct, facilities-based competition made possible by technological convergence) has caused the justifications for refusing to set rates on the basis of market prices to fall away.

We then use these insights to analyze access pricing with respect to three emerging regulatory issues: (1) access to unbundled network elements mandated by the Telecommunications Act of 1996, (2) access to utility poles compelled by the 1996 amendments to the Pole Attachments Act, and (3) open access to digital subscriber line (DSL) and cable modem networks providing high-speed broadband services.

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Access is becoming a potent conceptual tool for rethinking our worldview as well as our economic view, making it the single most powerful metaphor of the coming age.

Jeremy Rifkin¹

INTRODUCTION

One of the most striking economic developments of the last decade has been the increasing importance of telecommunications networks. Scientific breakthroughs have allowed the information and communications sectors to expand to more than eight percent of the nation's total economy,² having grown at roughly twenty percent each year, a rate more than five times faster than the overall economy.³ Telecommunications companies also played a starring role in a significant number of megamergers that have transformed the business environment⁴ and also served as a driving force behind the spectacular rise and equally spectacular fall of the NASDAQ index. The increase in the importance of the telecommunications sector has been matched by an increase in its volatility, with substantial overcapacity and the shakeout of companies interpreted by many as a classic boom-and-bust cycle.⁵ Perhaps most dramatically, the failure of WorldCom has produced the largest bankruptcy in U.S. history.⁶ As FCC Chairman Michael Powell noted, these developments have left the telecommunications industry in a state of "utter crisis," with banks worldwide contemplating industry write-offs of up to half-a-trillion dollars and telecom operators and vendors in the United States laying off half-a-million workers in a year and a half.⁷

The importance and the instability of the telecommunications sector highlight the importance of understanding how this sector is regulated. Not only does government policy play a key role in shaping returns and investment incentives, a growing number of commentators have suggested that regulation has played a decisive role in precipitating much of the turmoil that has wracked the industry of late,

¹ JEREMY RIFKIN, *THE AGE OF ACCESS* 15 (2000).

² See U.S. DEP'T OF COMMERCE, ECON. AND STATISTICS ADMIN., *DIGITAL ECONOMY 2002*, at 26 (2002), available at <http://www.esa.doc.gov/508/esa/pdf/DE2002r1.pdf>.

³ See *id.* at 25, 27 tbl.3.4 (reporting that the information technology sector was responsible for between twenty-five and thirty-two percent of annual GDP growth between 1996 and 2000).

⁴ Houlihan Lokey Howard & Zukin, Inc., *100 Largest Announcements in History*, MERGERSTAT REV. (Jan. 2000), LEXIS, Mstrev File.

⁵ See, e.g., Bill Atkinson, *No Recovery on Horizon for Telecoms*, BALT. SUN, Mar. 28, 2002, at 1C; Andrew Cassel, *What Really Battered WorldCom? End of Telecom Boom*, PHILA. INQUIRER, July 24, 2002, at C1; David Hayes & Suzanne King, *Telecom: From Boom to Bust*, KAN. CITY STAR, July 21, 2002, at A1.

⁶ Yochi J. Dreazen & Ryan Chittvim, *Upheaval at Worldcom*, WALL ST. J., July 22, 2002, at A6.

⁷ *Too Many Debts; Too Few Calls*, ECONOMIST, July 20, 2002, at 59, 59.

having shaped both the recent wave of mergers⁸ and the WorldCom bankruptcy.⁹ The direct link between regulation and industry performance makes understanding the economic implications of current regulatory policy all the more imperative.

For more than a century, telecommunications regulation was marked by a remarkable degree of segmentation and invariability. Because each communications service was available only through a single technology, each medium of communications could be governed by its own, discrete regulatory system that did not have to take into account the impact of other technologies. In addition, because policy makers tended to regard each medium as a natural monopoly, they subjected telecommunications networks to the now-classic regime of common-carriage regulation, in which state and federal regulatory authorities imposed nondiscrimination and mandatory service requirements, monitored quality, supervised investments, and restricted competitive entry. Most importantly, this approach focused on the rates that telecommunications providers could charge end users for purchasing *outputs*. The primary policy issue centered on whether such rates should be based on historical cost or replacement cost.¹⁰

Two emergent forces have begun to destabilize this century-old regulatory consensus. First, scientific advances are rendering different communications media increasingly interchangeable, allowing intermodal or platform competition. Not only has the emergence of competition between technological platforms provided consumers and firms with a dazzling variety of ways to access network services; it has also begun to put pressure on the historical regulatory distinction among voice, video, and data communications, in which each type of service was governed by a separate regulatory regime.¹¹

The second driving force is the fundamental shift in regulatory approach exemplified by the enactment of the Telecommunications Act of 1996.¹² The 1996 Act was designed to introduce competition into local telephone service by compelling every incumbent local telephone company to interconnect with its competitors on reasonable and nondiscriminatory terms and to provide them with unbundled

⁸ See Jim Chen, *The Magnificent Seven: American Telephony's Deregulatory Shootout*, 50 HASTINGS L.J. 1503, 1514–38 (1999).

⁹ For example, noted telecommunications expert Peter Huber has argued that Washington created WorldCom on the grounds that “[m]uch of the telecom industry’s current woe can be traced to government accountants who set interconnection tariffs at levels completely divorced from economic reality.” Peter Huber, *Washington Created WorldCom*, WALL ST. J., July 1, 2002, at A14.

¹⁰ See *infra* Part I.C.4.b.

¹¹ See Christopher S. Yoo, *Vertical Integration and Media Regulation in the New Economy*, 19 YALE J. ON REG. 171, 285–90 (2002).

¹² Pub. L. No. 104-104, 110 Stat. 56 (codified as amended in scattered sections of 47 U.S.C.).

access to every element of its network.¹³ Initially hailed as a major deregulatory change,¹⁴ it increasingly appears that, rather than representing a shift towards deregulation, the 1996 Act marked a shift towards a different style of regulation known as “access regulation.” Rather than regulating the terms under which consumers purchase *outputs*, access regulation instead regulates the ability of competitors to obtain *inputs*. The 1996 Act is part of a broader shift in regulatory philosophy that spans at least six network industries.¹⁵ As Jeremy Rifkin aptly acknowledges, we do indeed live in “the Age of Access.”¹⁶

These two forces have economic and constitutional implications that should fundamentally transform the manner in which policy makers approach network industries. Somewhat surprisingly, regulatory authorities have not adequately accounted for these forces. Instead, they have reflexively adhered to the cost-based approaches associated with traditional rate regulation without adequately considering whether these shifts require an equally fundamental change in regulatory approach. Because of the protracted nature of the legal proceedings regarding the implementation of compelled access, these issues have not yet been fully addressed by the courts, with the Supreme Court’s decisions in *Verizon Communications, Inc. v. FCC*¹⁷ and *National Cable & Telecommunications Ass’n v. Gulf Power Co.*¹⁸ representing only a few rounds of what will undoubtedly be a protracted series of major court decisions addressing these issues.

The debates about access to telecommunication networks have been further obscured by academic writings that have made networks seem like increasingly complex and exotic phenomena. Many of the basic concepts about networks remain poorly defined and misunderstood. In addition, networks tend to be characterized by sunk costs as well as economies of scale and scope that many theorists believe distinguish the economic analysis of networks from other forms of production.¹⁹ A burgeoning literature argues that networks are susceptible to unique types of market failures, so-called network externalities, which in turn require regulators to intervene in ways not required in other industries.²⁰

¹³ See 47 U.S.C. § 251(c)(2)–(3) (2000).

¹⁴ See, e.g., Statement by President William J. Clinton Upon Signing S. 652, 32 WEEKLY COMP. PRES. DOC. 218 (Feb. 12, 1996) (praising the Act for “providing a roadmap for deregulation in the future”); *Congress Maps a Telecom Future*, CHI. TRIB., Feb. 6, 1996, at 14 (calling the overall thrust of the Act “clearly deregulatory and pro-competitive”).

¹⁵ See Joseph D. Kearney & Thomas W. Merrill, *The Grand Transformation of Regulated Industries Law*, 98 COLUM. L. REV. 1323, 1340–46 (1998).

¹⁶ See RIFKIN, *supra* note 1, at 3.

¹⁷ 535 U.S. 467 (2002).

¹⁸ 534 U.S. 327 (2002).

¹⁹ See *infra* notes 107–10 and accompanying text.

²⁰ See *infra* notes 118–20 and accompanying text.

This Article is designed to place the issues surrounding access pricing on a sounder economic and legal foundation that takes into account the full import of the changes in technology and regulatory theory. Part I demystifies networks as an economic phenomenon by offering a more precise definition of what constitutes network access. As we will explain in greater detail later, network access is properly viewed as third-party use of the transmission services provided through the network. Economic analysis indicates that efficiency would best be promoted if access to those network services was based on market value. Reliance on market-based pricing mechanisms tends not only to allocate goods to their highest and best use; it also provides the proper signals to parties who consider investing in network technologies.

Rather than basing access prices on the market value of the network services provided, regulators continue to employ access-pricing methodologies that focus on the cost of the inputs used to establish the physical network. For the reasons we further explain in Part I, we find this approach to be quite problematic. Over time, competition tends to drive the market prices of outputs and the costs of production together so that ideally the purchase cost of inputs would represent a good approximation of the earning potential—and thus the market value—of those inputs. In practice, however, both purchase cost and market value are moving targets. Improvements in production technology, innovations in goods and services, shifts in consumer demand, entry and exit by producers, and changes in factor prices are likely to cause the market value of inputs to deviate from their initial cost. The greater the rate of change of technology and other forces, the greater this disparity is likely to be. Given the unpredictability of such changes, the deviations from market value caused by basing access prices on the cost of the inputs used to create the network will tend to lead to gluts or shortages and will eventually induce entrants to over- or under-invest in certain types of network capacity. Furthermore, basing access prices on input costs ignores the fact that the whole is typically greater than the sum of its parts. So long as a firm is efficient and creative, the value of the services it provides is likely to exceed the cost of the inputs it uses. Frictions such as transaction costs and asymmetric information, which are present in practically any market, are likely to create further discrepancies between market prices of inputs and factor costs.

The only plausible justification for basing regulated prices on costs incurred was that the absence of external markets caused by the lack of technological substitutes made it impossible to base rates on market prices. By stimulating direct facilities-based competition, the emergence of platform competition and the shift to access regulation

have made market-based pricing both feasible and desirable. Part I closes by refuting arguments advanced by other scholars suggesting that network industries are somehow prone to unique forms of market failure that justify adhering to cost-based pricing. Economies of scale and scope, sunk costs, and network economic effects do not generally cause market prices to deviate from levels that promote efficiency and do not change the basic analysis.

Part II describes the constitutional implications of the emergence of platform competition and the shift to access regulation by evaluating the limits that the Takings Clause places on the regulation of access pricing. Because rate regulation simply restricts the terms and conditions under which parties may contract for finished goods and services, it represents the type of adjustment of economic burdens traditionally subject to the more permissive analysis applied to nonpossessory takings.²¹ Access regulation, in contrast, typically requires network owners to permit third parties to place equipment on their property. As a result, access regulation necessarily falls within the Supreme Court's physical takings jurisprudence, which mandates that the government reimburse property owners for the market value of their property without regard to the economic impact of the regulation or whether the regulation in question furthers important public interests. Therefore, just compensation for compelled access exactly corresponds to economically efficient prices for compelled access.

Part III applies the analytical framework developed in the preceding Parts to three emerging policy problems: (1) unbundled access to elements of local telephone networks, an issue that underlay the Supreme Court's decision in *Verizon Communications, Inc. v. FCC*; (2) access to networks of utility poles, an issue that formed the basis for the Court's decision in *National Cable & Telecommunications Ass'n v. Gulf Power Co.*; and (3) open access to high-speed broadband systems, encompassing both cable modem systems and DSL systems, an issue that represents the focus of two ongoing proceedings before the FCC. We conclude that the steps taken to implement each of these access regimes violate the economic and constitutional principles that we have identified. Established principles of economics and constitutional law instead require that regulators adopt methodologies that base access rates on market prices.

I

EFFICIENT PRICING OF ACCESS TO NETWORKS

This Part removes some of the perceived mystery surrounding the economics of network access. It begins in subpart A by offering a definition of what constitutes a network and access to a network. Subpart

²¹ See, e.g., *Penn Cent. Transp. Co. v. City of New York*, 438 U.S. 104, 124–25 (1978).

B lays out the basic case for basing access rates on market pricing. Subpart C discusses the various methodologies for determining market prices. Finally, subpart D reviews the various features of networks that have led some commentators to suggest that reliance on market prices in network industries might not constitute the best way to promote economic efficiency.

In short, conventional economic principles dictate that access prices should be based on the market value of the incremental network services provided by the relevant input. Although the absence of comparable transactions in external markets has historically led regulatory authorities to eschew market-based pricing in favor of cost-based pricing, platform competition and the shift to access regulation have drained this justification of its vitality. The emergence of direct facilities-based competition from alternative telecommunications networks has created market-based benchmarks that can serve as independent bases for setting rates. Contrary to the suggestion of some commentators, distinctive economic features of networks such as sunk costs, economies of scale and scope, and network economic effects, do not alter this core conclusion.

A. Defining Access to Networks

At its most basic level, a *network* is a system of nodes connected by links. The nodes of a traditional telecommunications network are the company's switches and customer premises, while the links are the wires that connect them. In a wireless network, the nodes are the receivers and transmitters, and the links are the radio spectrum. Networks have many different configurations. A star-shaped network is a simple configuration in which there is a single hub and all lines are spokes. Hub-and-spoke networks have multiple hubs with high-capacity trunk lines connecting the main hubs and lower-capacity spokes reaching terminal points. The high-capacity trunk lines aggregate traffic and offer cost economies in comparison to a network that provides connections between every individual point. Telecommunications networks have high-capacity trunks or backbones and lower-capacity distribution lines such as the local loop to the individual home or business. Economic life is critically dependent on many types of privately owned networks: for communications (broadcast television and radio, cable television, telephone, broadband data, utility poles), for energy (electric power transmission and distribution, natural gas and petroleum pipelines), for transportation (airlines, rail-

roads, buses, trucks, shipping), and for distribution systems (postal services, product wholesale services).²²

The types of networks on which we are focusing generally are *physical production facilities* that encompass factors of production such as land, capital equipment, and technology.²³ Construction of these facilities requires network owners to invest in substantial fixed assets that should be viewed in the same way as other types of capital equipment such as manufacturing plants, office buildings, and commercial structures. Like other long-term assets, the network's physical production facilities do not vary directly with output in the short term. Moreover, like other capital investments, the configuration of the network's physical assets cannot be changed in the short term. Given sufficient time, however, the network's capital equipment is variable and can be adjusted to create different capacity levels. The operation of a network's facilities often requires variable inputs as well, such as the labor used to maintain its facilities and to monitor its operations.

In combination, the productive inputs that constitute the network are used to create a stream of *services*, such as the transmission and distribution of communications, that are the outputs of the network. Just as natural gas transmission does not consume the physical pipeline, usage of a telecommunications network does not consume the network itself, but instead only temporarily precludes the provision of services to some other user. Of course, network use does impose some wear and tear on the network's physical production facilities. The measures of depreciation employed under generally accepted accounting principles do not accurately indicate the value of the services provided by the equipment, however. As a result, the applicable depreciation rules typically do not properly reflect the equipment's economic life.

Access to a network refers to the use of the network's services, which are the outputs of the network.²⁴ Thus, access to a network does not

²² This Article focuses primarily on telecommunications networks. Although we suspect that the economic and constitutional concepts that we discuss may have implications for other network industries, such as energy and transportation, developing those ideas would require detailed consideration of the technological and regulatory conditions of those industries and would exceed the scope of this Article. We therefore reserve any firm policy conclusions with respect to energy and transportation networks. We believe, however, that the definitions of basic network concepts advanced in this subpart have general application to all network industries. As a result, we draw on examples from the energy and transportation industries to help illustrate the definitions that we are advancing.

²³ Our focus is on physical facilities in transportation, energy, and communications networks. We do not consider other uses of the term *networks* that refer to interconnected relationships between people, such as with social or business relationships.

²⁴ Although more general definitions of *access* exist, they seem too broad to provide guidance for pricing access to networks. See, e.g., BLACK'S LAW DICTIONARY 13 (7th ed. 1999) (defining *access* as "[a]n opportunity or ability to enter, approach, pass to and from, or communicate with"); 1 OXFORD ENGLISH DICTIONARY 72 (2d ed. 1989) (defining the

represent simply a physical connection to the network. Rather, access refers to the opportunity to benefit from the services generated by network usage. Because the use of network elements by another company potentially reduces the services that the network owner can provide, the correct access price depends on what the company could have obtained by using those network services itself or by selling network services to some other party. The proper measure of the value of network access is thus the value of the network services provided, which in turn is determined by the value of the network's final output.

B. Making the Economic Case for Market-Based Pricing of Network Access

1. *Market Prices, Regulated Prices, and Efficiency*

The consensus economic position is that so long as competition is sufficiently robust, market prices represent the best reflection of value. The market price is the outcome of the forces of supply and demand. The supply side of the market reflects the costs to sellers of providing a good, the demand side reflects the benefits to buyers from consuming the good. At market equilibrium, prices are thus determined by the *marginal* cost to sellers of providing a good and the *marginal* benefit to buyers of consuming it. Prices are adjusted through the process of exchange to balance supply and demand and to clear the market so that prices are further reflections of scarcity—the meeting of consumer wants and supplier capacities.²⁵

Because the services of a network are comparable to the output of other types of production facilities, they can be allocated by market processes. Markets refer to the interaction of buyers and sellers,²⁶

noun *access* as a “way or means of approach,” such as an “entrance, channel, passage, or doorway,” or the action of “coming to or towards; approaching,” and identifying the verb *access* as “[t]o gain access to (data, etc., held in a computer or computer-based system, or the system itself)”. This Article does not consider the notion of access as an entitlement, as is the case with access to facilities under the Americans with Disabilities Act, or with access to education or housing under antidiscrimination statutes.

²⁵ Classical economists, such as Adam Smith and David Ricardo, well understood that the determination of market equilibrium prices and value results from the interaction of supply and demand, at least in the short run. The classical economists had various cost-based explanations for the determination of the long-run prices of land, labor, and capital. Beginning in the nineteenth century, the marginalist revolution that led to today's neoclassical economy extended the supply-and-demand analysis consistently to output and input markets, both in the short and long run. See W. STANLEY JEVONS, *THE THEORY OF POLITICAL ECONOMY* 81–174 (2d ed., London, MacMillan 1879); CARL Menger, *PRINCIPLES OF ECONOMICS* 114–21 (James Dingwall & Bert F. Hoselitz eds. & trans., Free Press 1950) (1871); LÉON WALRAS, *ELEMENTS OF PURE ECONOMICS* 20 (William Jaffé trans., George Allen & Unwin Ltd. 1954) (1874); 1 ALFRED MARSHALL, *PRINCIPLES OF ECONOMICS* 554–61 (4th ed., London, MacMillan 1898); MARK BLAUG, *ECONOMIC THEORY IN RETROSPECT* 298–326 (rev. ed. 1968).

²⁶ On the role of intermediaries in market allocation mechanisms, see DANIEL F. SPULBER, *MARKET MICROSTRUCTURE: INTERMEDIARIES AND THE THEORY OF THE FIRM* (1999).

with market prices mediating between what buyers are willing to pay and what sellers are willing to accept. Market prices are determined through the activities of suppliers, customers, and intermediaries such as retailers and wholesalers. In the short run, firms increase prices when demand exceeds supply and lower prices when supply exceeds demand. In the long run, suppliers make production decisions by comparing the prices of goods to their costs and to the prices of alternative goods the supplier might provide. Firms will supply a good at some price if the cost of each unit provided and the cost at the margin (the last unit provided) are less than or equal to the market price. Conversely, consumers make purchasing decisions based on the benefits that they derive from that good and the availability of substitute goods. Consumers will purchase a good at some price if the benefits of each unit consumed at the margin (the last unit consumed) equal or exceed the market price. The price will eventually adjust until the market clears, at which point supply and demand will be in balance and the benefits to consumers will equal or exceed the costs to suppliers. The market price equals the marginal benefit of the good and thus indicates its economic value.

Markets are effective mechanisms for pricing not only physical products such as automobiles and food, but also services such as transportation or restaurant services. Many types of services are routinely purchased and sold. For example, video rental stores supply their customers with entertainment services corresponding to viewing a movie at home. Movie theaters provide similar entertainment services that require viewing the movie at the theater. Automobile renting and leasing companies supply customers with transportation services. Economic theory does not distinguish between the market allocation of physical products and the market allocation of services. Accordingly, markets can allocate network-generated services just as they do any other type of physical product or service.

Market prices promote *allocative* and *dynamic* efficiency. Efficient allocation of goods occurs when the purchasers of a particular good are those who obtain the greatest benefit from consumption and the suppliers of the good are those who incur the lowest cost of production. By allocating the good or service to the person or firm willing to pay the most, the price mechanism ensures that goods and services are placed in the hands of those able to put them to their best use. The price mechanism further ensures that goods and services are provided by the most efficient suppliers.

Dynamic efficiency is attained when economic actors make efficient investment decisions. Investment decisions are efficient when the present discounted value of the marginal returns to invest equals the marginal cost of investment. Market prices provide incentives for

efficient investment decisions because the market prices of services created by capital facilities are the best measure of the marginal benefit derived by users of those services. A firm deciding whether to invest in production facilities makes efficient decisions by considering the market value of the products and services to be created with those facilities in comparison to the cost of investment. Similarly, a firm choosing whether to purchase a good or service or to construct its own production facilities makes efficient decisions by comparing the market price of purchasing the good or service with the costs of constructing and operating its own facilities. Because market prices allocate productive capacity efficiently, signaling marginal benefits and marginal cost, they provide an accurate guide for investment decisions.

Regulated prices based on costs tend not to reflect accurately either the value of a good or service or the economic costs of producing the good or service. This results from the failure of regulatory authorities to process information about costs and benefits as effectively as the many buyers and sellers that make up a market.²⁷ Even worse, the government typically must rely on information provided by the regulated entities, which of course have a vested interest in the outcome.

As a result, it is not uncommon for regulated prices to cause allocative inefficiency. To the extent that the regulated prices deviate from market prices, they send incorrect signals to both users and suppliers of access. For example, regulation that sets the price of network access below market rates in effect requires network owners to subsidize competitors. This in turn leads those competitors to adjust the mix of inputs so that they employ reduced quantities of other inputs and greater quantities of network access. In addition, because access is an input used in the production of other goods and services, pricing it below market rates can cause competitors to make inefficient decisions about which markets to enter. Below-market pricing may mislead competitors into believing that the benefits of serving a particular market exceed the costs by understating the true economic costs associated with entering that market. The result not only creates allocative inefficiency in the primary market by stimulating excess demand for network access; it also creates secondary distortions in the markets for other inputs by increasing or reducing demand for those inputs. To the extent that the suppliers of access are regulated utilities, customers as well as the utilities will bear the burden.

In addition to impeding allocative efficiency, regulated pricing can also impede dynamic efficiency.²⁸ Pricing access at below-market

²⁷ See F.A. HAYEK, *THE FATAL CONCEIT* 85–88 (W.W. Bartley III ed., 1989).

²⁸ For an earlier discussion of the dynamic efficiency problems posed by access regulation, see Yoo, *supra* note 11, at 246–47, 268–69.

levels discourages existing network owners from investing in additional network capacity. At the same time, it also discourages competing companies from investing in alternative capacity, including substitute network technologies. This effect underscores the extent to which access requirements represent a policy anomaly. The central focus of competition policy is to prevent monopolies from emerging and to break them up whenever they occur. Access requirements, in contrast, leave the bottlenecks in place and instead simply require the monopolist to share its facilities. In addition, by rescuing competing firms from having to supply the relevant input for themselves, compelled access destroys the incentive to invest in alternative network technologies and thus deprives providers of emerging substitute technologies of their natural strategic partners. As a result, compelled access can entrench any supposed bottleneck facility by forestalling the emergence of alternative network technologies. This perverse effect is particularly problematic in technologically dynamic industries, in which the prospects of developing new ways either to circumvent or to compete directly with the alleged bottleneck are the brightest. And even if a regulatory regime were defensible when imposed, it all too often endures long after technological change has eroded its justifications.²⁹

Finally, there is good reason to question the extent to which rate-making authorities will make the pursuit of economic efficiency their primary goal. As demonstrated by the burgeoning literature on public choice, governmental institutions are subject to a wide variety of pressures that can cause them to redirect competition policy towards noneconomic ends.³⁰ The system of cross subsidies in telephone pricing aptly illustrates how governmentally established pricing can be directed towards political and social goals, and how such pricing is an imperfect guide to allocating goods and services or making investment decisions.³¹ A review of a previous attempt by the FCC to pro-

²⁹ See, e.g., STEPHEN BREYER, *REGULATION AND ITS REFORM* 286–87 (1982); 2 ALFRED E. KAHN, *THE ECONOMICS OF REGULATION* 127 (1971); Richard A. Posner, *Natural Monopoly and Its Regulation*, 21 *STAN. L. REV.* 548, 631–32 (1969).

³⁰ See, e.g., William J. Baumol & Janusz A. Ordover, *Use of Antitrust to Subvert Competition*, 28 *J.L. & ECON.* 247, 248–52, 256–59 (1985); Fred S. McChesney, *Be True to Your School: Chicago's Contradictory Views of Antitrust and Regulation*, in *THE CAUSES AND CONSEQUENCES OF ANTITRUST* 323, 323–33 (Fred S. McChesney & William F. Shughart II eds., 1995); Sam Peltzman, *Toward a More General Theory of Regulation*, 19 *J.L. & ECON.* 211, 211–12 (1976); Posner, *supra* note 29, at 618–25; George J. Stigler, *The Theory of Economic Regulation*, 2 *BELL J. ECON. & MGMT. SCI.* 3, 3–10 (1971).

³¹ See, e.g., David L. Kaserman & John W. Mayo, *Cross-Subsidies in Telecommunications: Roadblocks on the Road to More Intelligent Telephone Pricing*, 11 *YALE J. ON REG.* 119, 142–45 (1994).

mote competition through access requirements provides little basis for optimism in this regard.³²

The end result is similar to any system of rent controls, with demand for the service exceeding supply at the regulated price. Regulated prices do not fully serve their function of rationing user capacity and stimulating the provision of supplier capacity. In contrast, market prices send correct signals to companies that seek access as well as to utilities that provide access. Competing companies will have incentives to make economically correct decisions about the amount of services to obtain from the network access supplier and the extent to which they should invest in their own network services.

2. *The Difference Between Market Prices and Unit Costs*

As the foregoing discussion demonstrates, the market price of a good is the best indication of its value. The market price of a good can differ from the costs incurred in obtaining the inputs to produce the good because many forces affect market prices through changes in demand and supply. New methods of production that increase efficiency can increase supply at any given price. Changes in the relative prices of inputs, including finance capital, wages, land rents, and the prices of parts and components have complex effects on supply. The entry and exit of producers and decisions to expand or contract production capacity also impact supply. The introduction of innovative products can create shifts in both demand and supply toward these new products. Changes in consumer tastes and income, as well as changes in the prices of substitute and alternative goods, can also change demand at any given price. Accordingly, the market prices of output are unlikely to correspond to the past costs incurred to produce that output. Even if individual producers try to anticipate output prices in their decisions, market uncertainty will defeat their efforts, leading to randomness in profit margins.

Even if market prices were to reflect accurately the costs of the marginal producer, they would depart from the costs of the inframarginal producer. Costs tend to vary across firms because of differences in business methods, management techniques, production processes, and technological knowledge. Moreover, output value can depart from input costs because firms combine inputs in different ways, creating different products and addressing customer needs differently. Firm heterogeneity strongly implies that the unit costs of any individual firm are likely to differ from the market price. Under the textbook paradigm of perfect competition with identical firms and

³² See Donna N. Lampert, *Cable Television: Does Leased Access Mean Least Access?*, 44 FED. COMM. L.J. 245 (1992) (analyzing the leased access provisions in the Cable Act of 1984).

static demands, efficient entry guarantees that the market price eventually equals the unit cost of firms. This need not be the case when unit costs vary across firms.

Because of uncertainty regarding changes in output markets, there are likely to be deviations between output prices and unit costs. Some firms will earn economic profits and others will suffer economic losses. Moreover, firms often change prices in anticipation of developments because they respond to buyers' and sellers' expectations of future market conditions.³³

Even though competitive forces tend to move market prices toward cost through the exit or improvement of inefficient producers, the past costs of producing a good are likely to differ substantially from current and future costs. Costs fluctuate due to changes in input prices and technology. Market prices correspond more to current and forward-looking demand and supply conditions than to past costs. Traditional cost-of-service regulation *at best* adjusts prices to reflect past costs,³⁴ thereby permitting regulated rates to depart substantially from market prices. The fundamental reason for this departure is that the economic cost of inputs used to produce some output is not the same as the market price or economic value of an output produced with those inputs. Thus, market prices are necessarily better than regulated rates based on the costs of production.

C. Determining Market Price

1. *Pricing Based on External Market Transactions*

Arguing that regulatory authorities should base network access rates on market prices leaves open the question of how to determine the prevailing market price. Market transactions constitute the most (if not the only) reliable indicator of individual preferences.³⁵ Thus, regulators should develop market benchmarks if they choose not to defer to market mechanisms for allocation.

Under standard valuation techniques, the most reliable indicator of market price tends to be the *comparable sales approach*, in which the price charged for the hypothetical transaction in question is determined by prices charged in actual market transactions involving simi-

³³ "The question of fact is thus whether entrepreneurs as a class receive on the average more or less than the normal competitive rate of return on the productive services of person or property which they furnish to the business. The question does not admit to any definitive answer on inductive grounds." FRANK H. KNIGHT, *RISK, UNCERTAINTY AND PROFIT* 364 (1921).

³⁴ See *infra* Part I.C.4.a.

³⁵ See, e.g., Paul A. Samuelson, *Consumption Theory in Terms of Revealed Preference*, 15 *ECONOMICA* 243, 243-44 (1948).

lar goods.³⁶ Two types of market transactions can serve as external benchmarks for comparable sales. The easiest case occurs when a network owner sells into an external market the same type of access mandated by the government. In that situation, market value determination is simple because comparable sales can serve as a reliable proxy for the services provided.

In addition, market value may be inferred from the price charged for access to a substitute transmission technology providing similar services. Although the historical balkanization of communications has long made such determinations impossible, platform competition has made resort to this type of external benchmark increasingly feasible. Admittedly, transactions involving substitute technologies can be more difficult to apply as benchmarks than transactions using the same type of network. Differences in network configuration can complicate direct comparisons between alternative technologies. For example, although cable television and digital broadcast satellite (DBS) systems have emerged as direct competitors, the wire-based distribution of cable operators is necessarily restricted to a limited geographic area, whereas the footprint of DBS providers is inherently national in scope.³⁷ In addition, different network technologies provide different performance and reliability levels. As a result, prices must be adjusted to reflect differences in the type of network before any comparisons can be drawn. However complicated such adjustments can be, they are by no means so intractable as to render transactions occurring on alternative networks useless as external benchmarks for inferring market prices.

The other principal market-based valuation method is the *income capitalization approach*. When commercial property is involved, regulators can use a discounted cash-flow analysis to determine the present value of the income that the input is projected to earn.³⁸ Because the earnings are based on the prices charged in the output markets, it is possible to apply this method even if the input being priced is not sold in any external markets. In addition, because the income capitalization approach is based on data derived from actual market transac-

³⁶ See, e.g., Michael DeBow, *Unjust Compensation: The Continuing Need for Reform*, 46 S.C. L. REV. 579, 581–82 (1995); Glynn S. Lunney, Jr., *Compensation for Takings: How Much Is Just?*, 42 CATH. U. L. REV. 721, 727–28 (1993).

³⁷ DBS's inherently national scope makes it uniquely well suited to take advantage of the economies inherent in national distribution of video programming. See Christopher S. Yoo, *The Rise and Demise of the Technology-Specific Approach to the First Amendment*, 91 GEO. L.J. (forthcoming 2003) [hereinafter Yoo, *Rise and Demise*]; Christopher S. Yoo, *Rethinking the Commitment to Free, Local Television: A Public Goods Analysis* 37–38 (Vanderbilt Law and Economics Research Paper No. 02-09; Vanderbilt Public Law & Legal Theory Research Paper No. 02-09, 2002), at http://ssrn.com/abstract_id=333702 [hereinafter Yoo, *Rethinking Free, Local Television*].

³⁸ See, e.g., DeBow, *supra* note 36, at 581–82.

tions, it is still generally regarded as a reasonably reliable means for determining market value.

2. *The Second-Best Solution in the Absence of External Markets*

If a market benchmark is not available, then an estimate based on the economic costs of providing the service may be necessary. Such an estimate should approximate the market value of all the inputs used to create and operate the network, with the understanding that the market price of network access may be greater or less than that estimate. Over time, the market price of access should reflect the economic cost of all of the inputs used to provide network services. In the short run, however, market prices may deviate from economic cost. If network access is scarce, the market price of access would likely be greater than the replacement cost of the network. Conversely, with a glut of network capacity or obsolescence of network technology, the market price of access would likely be less than the replacement cost of the network. For example, a glut in fiber optic capacity would likely reduce the price of access to below the cost of the network. Accordingly, it is important to distinguish the market value of a good from the economic costs of providing it. However, the economic cost of providing that good, properly estimated, provides a second-best alternative.

The *economic cost* of producing a product or service equals the total opportunity costs of all the inputs used to produce that product or service. An input's *opportunity cost* refers to the value of the best opportunity necessarily foregone, that is, the return from the best alternative employment of that input. The economic cost of producing network services in telecommunications includes the opportunity costs of such inputs as capital, land and land rights, wires, utility poles, towers and fixtures, switches, control systems, construction costs, operation and maintenance expenses, and management costs. The *user costs of capital* associated with owning plants and equipment is equal to the foregone return from the best alternative investment of expenditures made for the plant and equipment.

For most productive inputs, the most accurate measure of opportunity cost is their market value, which is simply the current market price of the input less the avoidable direct costs associated with providing it. The best estimate is based on the opportunity cost of the input. For example, if a company owns a plot of land that it could rent to another company for \$500, the opportunity cost of using the land is \$500.

Replacement cost, which refers to the cost of purchasing an input at current market prices, in turn provides a reasonable approximation of market value. Replacement costs are forward-looking costs of con-

structing the network and include all costs that the utility would incur to rebuild its system, including capital, land, labor services, and management.³⁹ Accordingly, the market value of the inputs used to create a network includes the replacement costs of facilities and equipment, as well as the user cost of capital evaluated using the market cost of capital, land and land rights evaluated using current market rents, and current operation and maintenance expenses. A good proxy for replacement cost is the recent purchase cost of the input. Of course recent purchase cost is not a perfect measure, as the market price may have changed since the most recent purchase. Nonetheless, in the absence of indicia that more directly measure market value, replacement cost estimates based on comparable transactions provide a workable measure of market value.

It is now generally accepted that replacement cost is superior to historical cost as a measure of market value, because, as noted by then-Professor Stephen Breyer, “[a] competitive marketplace values assets, not at their historical price, but at their *replacement* value—the present cost of obtaining the identical service that the old asset provides.”⁴⁰ Historical costs suffer from several well-recognized infirmities. For example, the market value of an input may have increased or decreased since its purchase. In addition, historical costs will typically be based on the book values of plant and equipment (also known as “embedded costs”). The depreciation schedules allowed under the applicable accounting rules and tax laws often fail to constitute proper economic measures of depreciation. Replacement cost, in contrast, more accurately reflects changes in value. It is true that replacement cost is not without its own complications⁴¹ and that short-term changes can temporarily cause it to rise above or fall below equilibrium levels. Nonetheless, replacement cost provides a reasonably reliable measure of the direct costs of providing network services.

The costs of supplying network access also include transaction costs. The network operator must devote management and employee

³⁹ Scholars and policy makers disagree as to whether the replacement cost determination should be based on the network as it is currently configured or on a hypothetical network employing the most efficient technology and configuration available. Compare *Verizon Communications Inc. v. FCC*, 535 U.S. 467, 501–23 (2002) (holding that basing rates on hypothetical networks represented a reasonable construction of the applicable statute), and *Missouri ex rel. Southwestern Bell Tel. Co. v. Pub. Serv. Comm’n of Mo.*, 262 U.S. 276, 312 (1923) (Brandeis, J., concurring in the judgment) (advancing economic arguments in favor of hypothetical networks), with J. GREGORY SIDAK & DANIEL F. SPULBER, DEREGULATORY TAKINGS AND THE REGULATORY CONTRACT 419–25 (1997) (arguing in favor of basing on the replacement cost of existing networks). Resolution of this debate, while undoubtedly important in implementing any access regime, falls outside the scope of this Article, which focuses primarily on the importance of ensuring that any access prices set by regulatory authorities include some measure of the market demand for access.

⁴⁰ BREYER, *supra* note 29, at 38.

⁴¹ See *infra* notes 64–67 and accompanying text.

resources to handling the provision of network services, including arranging network connections, monitoring usage, and billing for network use. In the face of mandated access, the owner of the network must determine the existing demands for capacity and provide additional capacity to meet regulatory requirements. For example, in the case of pole attachments, the FCC initially required that a utility take “all reasonable steps” to expand the capacity of its poles, ducts, conduits, and even rights-of-way upon request by telecommunications carriers and cable operators.⁴² Moreover, the FCC still requires that electric utilities verify the amount of space that they would like to reserve for themselves.⁴³ This provision of pole attachment services may also require that utility owners accommodate those telecommunications or cable TV companies seeking access that is more convenient or less expensive than producing their own system of poles.⁴⁴ Transaction costs significantly affect prices and decisions in competitive markets. They may appear intangible to regulators and thus may be difficult for those subject to access requirements to recover.

3. *The Efficient Component Pricing Rule*

As emphasized thus far, pricing access to a network refers to the prices attached to the services generated by the entire network. An alternative regulatory approach to network access grants users the services of particular *inputs* to the network rather than the output of services from the network as a whole. This regulatory scheme originated with railroad trackage rights, whereby the Interstate Commerce Commission gave third-party operators access rights to another railroad’s track.⁴⁵ The scheme continues in the Telecommunications Act of 1996, which mandates a very different type of network access based on the use of the services of individual *components* of the network rather than the services of the network itself.⁴⁶ Thus, this approach focuses on the services of network inputs rather than the outputs. For example, with regards to network components such as the local loop, switches, or other facilities (called “network elements”), the 1996 Act

⁴² Implementation of Local Competition Provisions in Telecommunications Act of 1996, First Report and Order, 11 F.C.C.R. 15499, 16075–76 ¶¶ 1161–1163 (1996) (“*Local Competition Order*”), *rev’d in relevant part sub nom.* S. Co. v. FCC, 293 F.3d 1338, 1346–47 (11th Cir. 2002).

⁴³ *Id.* at 16078 ¶ 1169. Telephone and video companies that own poles are not allowed to reserve space. *Id.* at 16079 ¶ 1170. Unlike the previous provision, this provision was sustained on judicial review. *See* S. Co., 293 F.3d at 1347–49.

⁴⁴ *Local Competition Order*, 11 F.C.C.R. at 16076–77 ¶ 1164 (“We will not require telecommunications providers or cable operators seeking access to exhaust any possibility of leasing capacity from other providers . . . before requesting [the pole owner] to expand [its] capacity.”).

⁴⁵ *See* 49 U.S.C. § 11102(a) (2000).

⁴⁶ *See* 47 U.S.C. § 251(c)(3) (2000).

requires that incumbent local exchange carriers (LECs) provide “non-discriminatory access . . . on an unbundled basis at any technically feasible point.”⁴⁷ Such an access requirement is analogous to requiring that a manufacturer provide another company with the use of a piece of capital equipment, such as a machine tool. Incumbent LECs also have the duty to provide “physical collocation of equipment necessary for interconnection or access to unbundled network elements at the premises of the local exchange carrier.”⁴⁸ Collocation corresponds to a manufacturer allowing another company to locate its equipment in the manufacturer’s factory.

Regulating access to inputs raises some of the same issues as regulating access to the services provided by the network as a whole. The best way to price access to inputs is to consider the market price of similar access. If a market benchmark for access is not available, it is necessary to resort to cost-based estimates of providing access to the input.

It is misleading to assume, as does the FCC, that the cost to the network of providing the use of an input is confined to the direct cost of that input.⁴⁹ The input is part of a network, and accordingly, another company’s use of a network component necessarily has an impact on the output of services using the network. The network element’s capacity to provide network services is correspondingly diminished, thus reducing the output of services by the network itself. To take a simple example, a set of tires for an automobile may cost only \$400, but allowing another motorist to use the tires precludes the owner from using the automobile. The foregone value of the entire automobile might then be \$20,000. In the same way, the cost of allowing competing telecommunications companies access to unbundled network elements depends not only on the direct cost of providing that element, but also on the indirect cost of removing the services of that element from the incumbent telephone company’s network. Accordingly, the cost of providing access to unbundled network elements should be measured in terms of the reduction in overall network services that results from another company’s use of a network element for another purpose.

⁴⁷ *Id.*

⁴⁸ *Id.* § 251(c)(6).

⁴⁹ As will be discussed in greater detail later in this Article, the FCC issued regulations requiring that prices for the unbundled access to network elements be based on each element’s Total Element Long Run Incremental Cost (TELRIC). *See infra* notes 409–15 and accompanying text. This cost notion corresponds with the direct cost that a manufacturer would incur in providing another company with the usage of a piece of capital equipment in the manufacturer’s factory. It does not include any factors designed to capture opportunity costs.

The proper cost valuation of making an input available is the direct cost of the input plus the reduction in the value of the output. Thus, prices set at economic cost of an input must represent the sum of the direct incremental cost of providing the input and the opportunity costs associated with providing the input to a competitor. The analytical methodology for setting input access prices at these levels is known as the Efficient Component Pricing Rule (ECPR),⁵⁰ which would set access prices according to the following formula:

access price = incumbent's per-unit incremental cost of providing access + the incumbent's opportunity cost of providing the unbundled input.

Because another company's use of network elements potentially reduces the services that the network can provide, the correct price of those network elements depends on what the company could have obtained by selling network services. Thus, the market price of network services—the *outputs* of the network—should be used as the basis for determining the value of access to the services of network component—the *inputs* of the network. In the absence of market prices for network output, the opportunity cost calculation can be based on the regulated rates for the incumbent firm's output.

We acknowledge that allocating the retail markup among multiple products using ECPR (or any other access pricing method) poses conceptual and administrative problems. For example, if a competitor were to lease two or more network elements from an incumbent LEC, it would be improper to include the entire retail markup in the opportunity cost component for both elements, as this would in effect allow the incumbent LEC to recover twice for the same markup. The retail markup could be divided among the various elements, but doing so would require some method (probably based in cost accounting) for apportioning the markup to particular elements. While this problem is seen most clearly when the same competitor leases both elements, the identical problem would arise if two different competitors were to lease the same elements or even two different elements in the same chain of production. Although the allocation of foregone retail margin to particular components is inevitably arbitrary, such problems are endemic to any system of establishing prices for inputs. Apportioning the foregone retail margin should not prove any more

⁵⁰ The ECPR concept originally appeared in Robert D. Willig, *The Theory of Network Access Pricing*, in ISSUES IN PUBLIC UTILITY REGULATION 109 (Harry M. Trebing ed., 1979); William J. Baumol, *Some Subtle Pricing Issues in Railroad Regulation*, 10 INT'L J. TRANSPORT ECON. 341 (1983); and William J. Baumol & J. Gregory Sidak, *The Pricing of Inputs Sold to Competitors*, 11 YALE J. ON REG. 171, 178–89 (1994) (suggesting that local exchange carriers be allowed to sell to their competitors necessary inputs at a price that reflects all costs, including opportunity costs). For further discussion, see SIDAK & SPULBER, *supra* note 39, at 283–392. For a model of competition with ECPR pricing, see Daniel F. Spulber & J. Gregory Sidak, *Network Access Pricing and Deregulation*, 6 INDUS. & CORP. CHANGE 757 (1997).

intractable than the apportionment of common costs that must occur under any regulatory scheme that relies on compelled access.⁵¹ In any event, the pricing of the element should at least cover its direct incremental cost to avoid cross subsidization.

The market-determined Efficient Component Pricing Rule (M-ECPR) adjusts the calculation of opportunity costs by using a benchmark market price (if one exists), rather than regulated rates, for the incumbent firm's output. It is again likely that regulated rates for network services will not correspond to the market price of competing alternatives. Thus, the M-ECPR provides a method of adjusting access prices to reflect market prices of network services, thus promoting efficient allocation of network services as well as dynamic efficiency of investment decisions.⁵²

Any regulatory method that bases access prices solely on production costs without taking market demand into account will likely lead to allocative and dynamic inefficiency. The cost of providing access is not simply production cost, but also includes the value to the owner of the best opportunity foregone. Thus, access prices must include an opportunity cost component, preferably based on market prices, to reflect market demand for access. Including opportunity costs in access reflects the most fundamental economic principles.

4. *Traditional, Cost-Based Approaches to Setting Rates in Regulated Industries*

Conventional economic theory suggests that access rates in network industries promote economic efficiency only if they are based on market prices. If market-based pricing is unavailable, then the appropriate second-best solution is to base rates on the economic costs of providing access, a concept that embraces both direct incremental costs and opportunity costs. The classic rate-making approach taken by regulatory authorities, however, focuses solely on direct incremental costs and excludes opportunity costs. Even regulatory authorities who are willing in principle to regard opportunity costs in their rate-making calculus in practice eliminate opportunity costs by positing that they are zero. The following discussion analyzes the flaws in both of these approaches.

⁵¹ See Implementation of Local Competition Provisions in Telecommunications Act of 1996, First Report and Order, 11 F.C.C.R. 15499, 15852–53 ¶ 696 (1996) (“*Local Competition Order*”) (proposing two “reasonable” approaches to allocating common costs: use of a fixed allocator and allocation of “only a relatively small share of common costs to certain critical network elements . . . that are most difficult for entrants to replicate promptly”), *rev'd in relevant part sub nom.* S. Co. v. FCC, 293 F.3d 1338, 1346–47 (11th Cir. 2002).

⁵² See SIDA & SPULBER, *supra* note 39, at 307–33.

a. *Direct Cost*

The overwhelming majority of regulatory authorities have established rates solely on the basis of direct costs.⁵³ The dominant initial position was the “fair value” principle associated with the landmark decision in *Smyth v. Ames*,⁵⁴ which required that rates be based on the replacement cost of the assets used to provide the service.⁵⁵ The Court based its preference for replacement costs on the recognition that if the regulated entity constituted a natural monopoly, by definition no external transactions would exist that could serve as the basis for market-based pricing.⁵⁶ At the same time, parties who obtained service under a regulated rate always had the option of constructing a substitute facility. This meant that in the long run, replacement cost would tend to reflect market demand. Although in some circumstances technological and functional obsolescence could cause replacement cost to be a misleading reflection of market value, in the absence of data based on actual transactions it remained a useful proxy.⁵⁷

The primary alternative to the replacement cost approach associated with *Smyth v. Ames* was the historical cost methodology associated with Justice Brandeis’s separate opinion in *Missouri ex rel. Southwestern Bell Telephone Co. v. Public Service Commission*.⁵⁸ Although Justice Brandeis recognized that analyzing the comparable sales approach would represent the most accurate methodology for determining the utility’s value for rate-making purposes, he concluded that such prices were impossible to determine, “since utilities, unlike merchandise or land, are not commonly bought and sold in the market.”⁵⁹ Brandeis further noted that calculating value by capitalizing the utility’s earnings necessarily embroiled regulatory authorities in a “vicious circle.”⁶⁰ As the Court later noted, “The heart of the matter is that rates cannot be made to depend upon ‘fair value’ when the value of the going enterprise depends on earnings under whatever rates may be antici-

⁵³ See *infra* notes 54–76 and accompanying text.

⁵⁴ 169 U.S. 466 (1898), *overruled by* Fed. Power Comm’n v. Natural Gas Pipeline Co., 315 U.S. 575 (1942).

⁵⁵ On its face, *Smyth v. Ames* appeared to offer a laundry list of considerations to guide the rate-making determination. See *id.* at 546–57. If placed in context, however, it is clear that *Smyth* and its progeny firmly endorsed the replacement-cost approach to rate regulation. See Stephen A. Siegel, *Understanding the Lochner Era: Lessons from the Controversy over Railroad and Utility Rate Regulation*, 70 VA. L. REV. 187, 227–28 (1984).

⁵⁶ See *Smyth*, 169 U.S. at 544–47.

⁵⁷ See Siegel, *supra* note 55, at 221–22, 228–29, 231; *supra* notes 39–40 and accompanying text.

⁵⁸ 262 U.S. 276, 292–94 (1923) (Brandeis, J., concurring in the judgment).

⁵⁹ *Id.* at 292 (Brandeis, J., concurring in the judgment).

⁶⁰ *Id.* (Brandeis, J., concurring in the judgment).

pated.”⁶¹ As a result, fair value becomes “the end product of the process of rate-making not the starting point.”⁶²

In the absence of some market-determined basis for setting rates, Brandeis believed that rates necessarily must be based on some measure of cost.⁶³ He recognized that replacement cost might well represent the best evidence of present value, as it constitutes a better reflection of technological improvements.⁶⁴ In the end, however, pragmatic considerations led Brandeis to advocate relying on historical costs. Determining replacement cost, he concluded, is an inherently speculative endeavor.⁶⁵ Basing value on replacement cost, moreover, exposes both consumers and investors to the risks associated with fluctuations in market prices.⁶⁶ By comparison, relying on historic cost results in fewer subjective determinations of value.⁶⁷

Brandeis’s argument quickly became one of the focal points in the debate over rate-setting methodologies.⁶⁸ The Supreme Court has frequently invoked it to explain why various regulatory authorities have decided not to use market-based pricing when setting rates.⁶⁹ Eventually, however, the controversy between historical and replacement cost ended in a somewhat inconclusive draw. Rather than resolving this dispute on its substantive merits, the Supreme Court ultimately invoked notions of administrative deference and judicial restraint to reject the belief that rates must be set in accordance with any particular approach. Thus, the Court resolved to uphold any rate determination, regardless of methodology, so long as it fell within a

⁶¹ Fed. Power Comm’n v. Hope Natural Gas Co., 320 U.S. 591, 601 (1944).

⁶² *Id.*; accord Verizon Communications, Inc. v. FCC, 535 U.S. 467, 482–84 (2002); Duquesne Light Co. v. Barasch, 488 U.S. 299, 309 n.5 (1989); Fed. Power Comm’n v. Natural Gas Pipeline Co., 315 U.S. 575, 603 (1942) (Black, J., concurring); St. Louis & O’Fallon Ry. Co. v. United States, 279 U.S. 461, 504 & n.22, 505 (1929) (Brandeis, J., dissenting); Jim Chen, *The Second Coming of Smyth v. Ames*, 77 TEX. L. REV. 1535, 1556 (1999); Siegel, *supra* note 55, at 246–47.

⁶³ See *Southwestern Bell*, 262 U.S. at 299–300.

⁶⁴ See *id.*

⁶⁵ See *id.* at 292–302; see also BREYER, *supra* note 29, at 38–39 (noting that “to determine the replacement cost of plant or equipment is too complex a task for an administrative process”).

⁶⁶ See *Southwestern Bell*, 262 U.S. at 302–08. To the extent that Brandeis’s opinion evinces a strong desire to insulate both consumers and investors from the dislocation caused by market fluctuations, it exhibits some strikingly anti-economic tendencies. His position is perhaps explained by the desire to promote classical-style democracy that permeates his jurisprudence. See L.S. Zacharias, *Repaving the Brandeis Way: The Decline of Developmental Property*, 82 Nw. U. L. REV. 596, 634–38 (1988). A more cynical observer might suggest that his interest in protecting investors from market fluctuations followed more from his substantial holdings in commercial paper issued by utilities. See *id.* at 637–38.

⁶⁷ See *Southwestern Bell*, 262 U.S. at 308–10.

⁶⁸ See Siegel, *supra* note 55, at 240 n.227.

⁶⁹ See Verizon Communications, Inc. v. FCC, 535 U.S. 467, 483 (2002); Duquesne Light Co. v. Barasch, 488 U.S. 299, 308 & n.5, 309 (1989); Fed. Power Comm’n v. Natural Gas Pipeline Co., 315 U.S. 575, 603 (1992) (Black, J., concurring).

fairly broad zone of reasonableness.⁷⁰ These principles allowed the Court to sustain a wide variety of rate-making methodologies based on increasingly complicated versions of historical or replacement cost.⁷¹ Eventually, formal rate-making gave way to the imposition of price caps, in which the maximum rates that utilities could charge in any particular year did not depend on costs, but rather on the rates set the previous year, reduced by a fixed percentage to reflect increases in productivity.⁷² The rates charged for the initial year in the typical price-cap scheme, however, were based on historical cost.⁷³ Therefore, although the utility could adjust prices below the cap, price-cap methodologies did not cure the basic flaw of failing to reflect demand considerations.

The unifying thread to these approaches was their commitment to basing rates on direct cost (whether historical or replacement cost) and their refusal to take opportunity cost or market-based influence into account.⁷⁴ Fortified by this background, regulators charged with implementing access regimes have tended to follow the traditional patterns and have based access rates solely on either historical or replacement cost.⁷⁵ As the foregoing discussion reveals, however, regulatory approaches that base rates solely on direct costs suffer from a fundamental conceptual flaw. Because they fail to reflect the earning potential of the regulated input, approaches based on direct cost,

⁷⁰ As the Court noted in *Hope Natural Gas*, “[I]t is the result reached not the method employed which is controlling. It is not theory but the impact of the rate order which counts. . . . The fact that the method employed to reach that result may contain infirmities is not then important.” Fed. Power Comm’n v. *Hope Natural Gas*, 320 U.S. 591, 602 (1944) (citations omitted); *accord Duquesne*, 488 U.S. at 314–16; *Natural Gas Pipeline Co.*, 315 U.S. at 586. See generally Siegel, *supra* note 55, at 254–59 (describing a standard whereby “[l]egislative decisions should stand . . . unless ‘so outrageous as to shock the common sense of justice’”) (quoting Gerard C. Henderson, *Railway Valuation and the Courts*, 33 HARV. L. REV. 902, 1056 (1920)). It should be noted that using reasonableness to evaluate the sufficiency of compensation is itself somewhat circular. See *Lucas v. S.C. Coastal Council*, 505 U.S. 1003, 1034 (1992) (Kennedy, J., concurring in the judgment).

⁷¹ See, e.g., *Verizon Communications, Inc. v. FCC*, 535 U.S. 467, 496–518, 523–25 (2002) (upholding replacement cost methodology as a matter of statutory construction, but declining to address the overall reasonableness of rates on ripeness grounds); *Duquesne*, 488 U.S. at 310–12 (upholding rates based on modified historical-cost methodology); *Permian Basin Area Rate Cases*, 390 U.S. 747, 761, 768–74 (1968) (upholding rates based on composite cost data from an entire area rather than prevailing field prices); *Hope Natural Gas*, 320 U.S. at 596–98, 603–05 (upholding rates based on historical cost).

⁷² See, e.g., *Policy and Rules Concerning Rates for Dominant Carriers, Report and Order and Second Further Notice of Proposed Rulemaking*, 4 F.C.C.R. 2873 (1989).

⁷³ *Verizon*, 535 U.S. at 486 (citing *United States Tel. Ass’n v. FCC*, 188 F.3d 521, 524 (D.C. Cir. 1999) and Alfred E. Kahn et al., *The Telecommunications Act at Three Years: An Economic Evaluation of Its Implementation by the Federal Communications Commission*, 11 INFO. ECON. & POL’Y 319, 330–32 (1999)).

⁷⁴ *Verizon*, 535 U.S. at 484 (citing ALFRED E. KAHN, *THE ECONOMICS OF REGULATION* 40–41 (1988)).

⁷⁵ See, e.g., *infra* notes 397–403, 496–99 and accompanying text.

whether historical or replacement, are incompatible with a century of economic insight.⁷⁶

The only conceivable justification for failing to base rates on market prices is that the absence of comparable transactions rendered such an attempt inherently circular. Indeed, as the foregoing discussion reveals, Justice Brandeis and the regulatory authorities and courts that followed his lead relied on this reasoning to justify their advocacy of cost-based approaches.⁷⁷ What modern regulatory authorities have failed to recognize is the manner in which the emergence of platform competition and the shift from rate regulation to access regulation have now made it possible to base rates on market benchmarks. The possibility of input substitution allows external markets for inputs to exist even in the absence of external markets for final goods. In addition, the *raison d'être* of access regulation is to foster competition in final goods markets. Any success in doing so will only serve to further undercut the justification for refusing to base rates on market transactions. The shift from output to input regulation has also undermined the previously proffered reasons for rejecting the income capitalization approach. When regulation focuses on the rate charged for an input rather than for a final good, the regulated price becomes only one of many factors that determines the good's overall earning potential. As long as the input remains only one component of the overall good, the income capitalization approach is not tautological. The degree of circularity will be limited to the percentage of the total cost of the final good represented by the regulated input.

Equally important is the manner in which technological change has allowed competition among different network platforms to develop. The availability of substitute networks employing alternative means of transmission has in turn created external markets that now make it possible for regulatory authorities to base rates on prices charged in actual market transactions. In addition, the advent of facilities-based competition in turn can lead to deregulation of the rates charged for the final good, which will eliminate the circularity inherent in the income capitalization approach.

In short, two fundamental changes are transforming the basic approach to regulating network industries: the development of platform competition and the shift to access regulation. These changes undercut the rationale underlying rate-making authorities' decisions both to

⁷⁶ See Herbert Hovenkamp, *The Marginalist Revolution in Legal Thought*, 46 VAND. L. REV. 305, 325 (1993) (citing marginalism's impact on the debate over the use of historical cost); Siegel, *supra* note 55, at 251–52 (noting that although some jurists used neoclassical economics to attack the replacement cost methodology associated with *Smyth v. Ames*, the critique ultimately proved too much by also undermining attempts to base rates on historical cost).

⁷⁷ See *supra* notes 58–62 and accompanying text.

base rates on some measure of direct costs and to exclude from their calculus components designed to reflect earning potential. Together, the development of platform competition and the shift to access regulation have rendered continued adherence to that approach untenable and mandate, as a matter of economic policy, that regulatory authorities begin to base access rates on market prices.

b. *Excess Capacity and Zero Opportunity Costs*

Courts that have recognized the importance of ensuring that access rates contain some measure of opportunity cost have begun to employ a different gambit to justify basing access rates solely on direct incremental costs—by positing that opportunity costs were zero. In *Loretto v. Teleprompter Manhattan CATV Corp.*,⁷⁸ for example, the State of New York replaced a privately negotiated system, in which cable companies who wished to lay cable television wires across a given apartment building would pay the building owner a standard rate of five percent of the revenue realized from that building, with a regulatory regime that accorded building owners a grand total of one dollar in compensation.⁷⁹ In a decision that was ultimately overturned by the U.S. Supreme Court, the New York Court of Appeals ruled that this nominal compensation represented a fair return to the building owner, given that the equipment in question occupied “an area of the building for which she does not claim to have any other use.”⁸⁰ According to the court, then, the opportunity cost of occupying property not currently employed for other purposes was, in effect, zero. The concurring opinion sounded a similar note when it offered that “if the installation of a cable substantially interfere[d] with the owner’s present or future use of the building, we must presume that the [State] would award reasonable compensation for the taking pursuant to its regulations.”⁸¹

The point is made even more dramatically in the Eleventh Circuit’s decision in *Alabama Power Co. v. FCC*,⁸² sustaining the compensation regime established under the Pole Attachments Act. In that case, the court acknowledged the importance of according the owners of networks of utility poles the fair market value of access to their poles, which included the pole owner’s opportunity costs.⁸³ The court none-

⁷⁸ 458 U.S. 419 (1982). The U.S. Supreme Court’s *Loretto* opinion is analyzed in detail *infra* Part II.A.2.

⁷⁹ See 458 U.S. at 423–25.

⁸⁰ *Loretto v. Teleprompter Manhattan CATV Corp.*, 423 N.E.2d 320, 333 (N.Y. 1981), *rev’d*, 458 U.S. 419, 421 (1982).

⁸¹ *Id.* at 336 (Gabrielli, J., concurring).

⁸² See 311 F.3d 1357, 1367–71 (11th Cir. 2002). The Pole Attachments Act and the *Alabama Power* decision are discussed in greater detail *infra* Part III.B.1.

⁸³ See *Ala. Power*, 311 F.3d at 1368–69.

theless sustained a regime that based rates solely on direct incremental costs on the ground that one person's use of the network does not necessarily preclude another person's use.⁸⁴ Thus, so long as excess network capacity exists, the grant of a right of access does not foreclose any opportunities to sell space to other interested firms. The court concluded, then, that the opportunity costs of allowing another party to access the network was zero. Therefore, the court held that access rates need not include compensation for opportunity costs unless 1) the network was at full capacity, and 2) other parties sought access, or the network owner had a higher-valued use for that capacity.⁸⁵

These opinions ignore certain aspects of networks' infrastructure investments that make excess capacity inevitable. Capacity in network industries is notoriously "lumpy" in that it can only be efficiently added in large, discrete quantities. In addition, if the needs of network users are to be met, such capacity must necessarily be added before it is actually needed, a problem that is particularly acute for carriers of last resort who are obligated to provide service to anyone who requests it.⁸⁶ The tendency towards excess capacity is exacerbated further by the manner in which excess capacity can enhance network reliability and provide insurance against unforeseeable variability in demand.⁸⁷ These qualities make excess capacity a feature that is endemic to all networks. In addition, these courts have fallen into the same trap as computer system managers that have allowed additional users free use of what, at the time, appeared to be excess capacity. That is, this approach overlooks the fact that use of what appears to be excess capacity imposes real costs by hastening the need for additional capacity. The fact that the use of the facility does not consume the facility is of no consequence. As we have pointed out earlier,⁸⁸ this is a quality that is inherent in all physical networks and, to some extent, in capital assets generally.

Finally, even assuming for the sake of argument that the costs associated with allowing access to a building were zero, it does not necessarily follow that nominal compensation is sufficient to make the building owner whole. Economic analysis indicates that the price charged by the building owner would be determined in part by the amount that other potential users of the same resources might be will-

⁸⁴ See *id.* at 1370.

⁸⁵ See *id.* at 1369–71.

⁸⁶ See SIDAK & SPULBER, *supra* note 39, at 119–27; William J. Baumol & J. Gregory Sidak, *The Pig in the Python: Is Lumpy Capacity Investment Used and Useful?*, 23 ENERGY L.J. 383, 385–86 (2002).

⁸⁷ See SIDAK & SPULBER, *supra* note 39, at 126–27; Baumol & Sidak, *supra* note 86, at 386–89.

⁸⁸ See *supra* Part I.A.

ing to pay. The price would also be determined by the value of that access to the person purchasing it.⁸⁹ In other words, the assumption that networks with excess capacity face zero opportunity costs ignores the fact that market value is determined in part by demand-side considerations that are independent of any supply-side, cost-oriented considerations. The mere fact that access to the facility has value to the party seeking access gives the facility's owner both the incentive and the ability to insist on receiving more than nominal compensation.

The facts of *Loretto* provide an apt illustration of these basic concepts. The value of the right to attach a cable wire to an apartment building is not determined by the costs of constructing a half-inch strip across the roof and down the face of an apartment building, as a rate-making approach based on historical or replacement cost might suggest. In addition, the fact that attaching a cable television wire to a building does not consume the building does not mean that the right to attach has no real value absent proof that the building owner had some other use for the same space. Our analysis indicates instead that the value of the right to attach the cable wire to an apartment building is determined by the value of the services that are provided through those wires. Indeed, it is no surprise that the pricing arrangement negotiated among the parties—before the state began regulating such access—was based on a percentage of the value of the services provided by the cable company.⁹⁰

D. Demystifying Network Economics

Fundamental economic principles thus indicate that efficiency would best be promoted if network access prices were based on the market value of the relevant inputs. If direct, market-based indicia are not available, regulatory authorities should use a methodology such as ECPR that includes the direct costs as well as the opportunity costs of providing the input. That said, some markets contain features that can cause them to fail to produce outcomes that promote efficiency. In particular, barriers to entry by new competitors may constitute a cause of market failure, particularly if the incumbent is a monopolist. The existence of barriers to entry can provide a monopoly incumbent with the market power to distort prices away from efficient levels. Some commentators have suggested that network industries possess

⁸⁹ To use a concrete example, the fact that a summer home may be unoccupied during the winter would arguably justify regarding the home as having excess capacity. It does not follow, however, that the government would be justified in forcing the owner to rent the home to another person who wished to occupy it during the winter for only a nominal fee. The rent that normally would be charged would depend upon the number of other possible renters as well as the amount that the owner could obtain by refusing to contract at a particular price.

⁹⁰ See *supra* notes 78–81 and accompanying text.

features, such as sunk costs, economies of scale and scope, and network economic effects, that may deter entry in ways that can cause market outcomes to deviate from efficient levels.⁹¹

The analysis that follows refutes those arguments. As a preliminary matter, the standard discussions of entry barriers assume that they are an exogenous feature of technology.⁹² In fact, companies choose their technology, by carrying out research and development and by choosing production methods and product features. Because many aspects of technology are endogenous, it is thus likely that competitors will find their way around technological impediments to entry.⁹³ Moreover, most of these features, which are not unique to network industries, are easily taken into account by traditional price mechanisms. Because these network features do not serve to deter entry, potential competition by new entrants will discipline established firms and is likely to lead to competitive pricing and innovation. Even if entry barriers exist, multiple incumbents could compete with each other, leading to competitive prices.

1. *Economies of Scale and Scope*

Economies of scale and scope exist in networks, but they do not prevent markets from allocating the services that networks provide. *Economies of scale* exist for a single-product firm if unit costs decline as a function of output.⁹⁴ For a multiple-product firm, economies of scale mean that total production costs exceed the total of each output multiplied by its marginal cost. *Economies of scope* exist if a company achieves cost economies by producing goods in combination rather than separately.

Networks certainly exhibit economies of scale. Large-scale networks can employ advanced high-capacity switches. Moreover, a firm building and operating a large network benefits from economies of scale because it can spread the overhead costs associated with construction and maintenance over a larger set of activities. Economies of scale may also be present because of volume-surface relationships, so that the volume of a conduit can be expanded with a less-than-proportional increase in the surface. Moreover, the unit costs of capacity in a transmission line decline because the necessary cost of constructing the conduit remains fixed regardless of the number of transmission wires placed inside the conduit. Therefore, telecom

⁹¹ See *infra* notes 96, 107–10, 115–26 and accompanying text.

⁹² See, e.g., GEORGE J. STIGLER, *THE ORGANIZATION OF INDUSTRY* 67 (1968).

⁹³ See Daniel F. Spulber, *Competition Policy in Telecommunications*, in 1 *HANDBOOK OF TELECOMMUNICATIONS ECONOMICS* 477, 495–97 (Martin E. Cave et al. eds., 2002).

⁹⁴ Much of the discussion in this section draws upon Spulber, *supra* note 93, and Daniel F. Spulber, *Deregulating Telecommunications*, 12 *YALE J. ON REG.* 25 (1995) [hereinafter Spulber, *Deregulating*].

companies find that the incremental cost of installing additional fiber capacity during initial installation is less than the actual unit cost of installing fiber capacity.

Because networks can use common facilities to provide multiple services, networks also contain economies of scope. For example, the same switch can provide multiple services such as call waiting and call forwarding. A network's economies of scope can also derive from its structure. For example, if a network's products are viewed as connections between pairs of network users, rather than operating a point-to-point network, then traffic can be aggregated in trunk lines with points reached by distribution or feeder lines. By realizing economies of scale in the trunk lines, the firm achieves economies of scope in the production of multiple connections.

Economies of scale and scope exist in practically any industry. For example, in the automobile industry, the unit cost of producing an automobile is lower the more automobiles a manufacturer produces. Producing only a few cars requires making them practically by hand. Producing many cars allows a manufacturer to develop a large plant that benefits from automation as well as specialization and division of labor, as recognized by Adam Smith.⁹⁵ Economies of scope also explain why an automobile manufacturer can save costs by producing many types of cars—the company shares the common costs of manufacturing, engineering, and management across multiple product lines.

Contrary to the suggestions of some scholars,⁹⁶ the presence of cost economies in manufacturing does not prevent markets from allocating goods and services that are produced with economies of scale. Multiple producers can have economies of scale and scope and compete with each other in supplying goods and services. For example, automobile manufacturers compete with each other to sell cars unhindered by the presence of cost economies in manufacturing. There is no *a priori* reason that markets for telecommunications services should differ in any way. Multiple networks can operate with economies of scale and scope and still compete to supply services to customers. Market prices thus continue to be an accurate measure of value.

⁹⁵ See ADAM SMITH, THE WEALTH OF NATIONS 3–16 (Edwin Cannan ed., 1937) (1776).

⁹⁶ For the classic argument that economies of scale constitute barriers to entry, see JOE S. BAIN, BARRIERS TO NEW COMPETITION 53–113 (1956). For an application of this argument to local telephony, see Glenn A. Woroch, *Local Network Competition*, in HANDBOOK OF TELECOMMUNICATIONS ECONOMICS, *supra* note 93, at 641, 693, 708 (arguing that “the strong scale and scope economies inherent in production of network services, and the huge sunk investments that are necessary for facilities-based supply” are barriers to entry into local exchange telecommunications, but noting that technological change can also help entrants).

Sufficient scale relative to the size of the market results in a *natural monopoly*.⁹⁷ A given industry is said to exhibit natural monopoly characteristics if the cost function derived from the underlying technology is “subadditive,” that is, if a single firm can supply the entire market at lower cost than could two or more firms.⁹⁸ If the technology of local telephone service were to exhibit natural monopoly characteristics, then a single firm could construct and operate that network at a lower cost than could two or more firms. Multiproduct cost functions are said to exhibit natural monopoly characteristics if and only if the cost function derived from the underlying technology is subadditive across products. That is, cost functions exhibit natural monopoly characteristics when the costs incurred by a single firm producing the entire set of products are less than the costs that would result if the same production were divided between two firms. Whether existing telecommunications network technology falls within this definition is a matter of controversy.⁹⁹

⁹⁷ Economies of scale can result from many different technological factors, such as specialization of function and division of labor permitted by increased output. Fixed costs, which do not vary with output fluctuations, are a source of economies of scale that is particularly significant in the telecommunications industry and other industries that require networks, such as railroads, oil and natural gas distributors, and electricity and water service providers. See SIDAK & SPULBER, *supra* note 39, at 22. For a network system, fixed costs are the “costs of facilities such as transmission lines, which are not sensitive to the level of transmission on the lines.” *Id.* Economies of scale at a given output level are not necessary for natural monopoly. A natural monopoly can exist at an output level at which the cost function exhibits decreasing returns to scale. For further discussion, see DANIEL F. SPULBER, REGULATION AND MARKETS 117–18 (1989).

⁹⁸ The concept of natural monopoly is generally credited to John Stuart Mill, who emphasized the problem of wasteful duplication of transmission facilities that can occur with utility services. See JOHN STUART MILL, PRINCIPLES OF POLITICAL ECONOMY 107 (George Routledge & Sons 1900) (1848).

⁹⁹ For statistical studies showing that telecommunications network costs are not subadditive, see David S. Evans & James J. Heckman, *A Test for Subadditivity of the Cost Function with an Application to the Bell System*, 74 AM. ECON. REV. 615, 620 (1984) (showing that AT&T’s costs were not subadditive); Richard T. Shin & John S. Ying, *Unnatural Monopolies in Local Telephone*, 23 RAND J. ECON. 171, 181 (1992) (finding that the local exchange carriers costs were not subadditive prior to the AT&T antitrust divestiture). Estimating telecommunications network costs can be problematic for regulated companies because data are obtained from regulatory accounting information. Also, the data are often presented at an aggregate level that is not suited to the evaluation of cost functions. Paul L. Joskow & Roger G. Noll, *The Bell Doctrine: Applications in Telecommunications, Electricity, and Other Network Industries*, 51 STAN. L. REV. 1249, 1260–61 (1999). The estimation of cost functions using standard econometric techniques is difficult at best, because an established legacy system built up over decades is not likely to be optimized. Engineering cost models that make assumptions about system configurations need not describe the costs of existing systems. Moreover, the notion of comparing the costs of two identical systems serving the same geographic area is likely to be counterfactual. For a review of the literature analyzing whether costs in the cable television industry are subadditive, see Thomas W. Hazlett, *Duopolistic Competition in Cable Television: Implications for Public Policy*, 7 YALE J. ON REG. 65, 71–75 (1990).

The existence of a natural monopoly does not necessarily preclude competitive entry, however. For example, even if a particular telecommunications technology were to exhibit natural monopoly characteristics, providers could still achieve efficient retail prices if they were required to compete through periodic auctions for the right to serve the market.¹⁰⁰ Moreover, proponents of “contestability” theory have demonstrated that so long as entry and exit are easy, the potential for new entry can drive prices towards competitive levels even if the technology makes it most efficient for a single firm to serve the entire market.¹⁰¹ Thus, even if the incumbent firm prices at cost, there will still be situations in which it cannot set a price that sustains its position against entry.

Moreover, natural monopoly technology need not impede competition, because the technology of entrants can differ from that of incumbents. The standard textbook definition of *natural monopoly*, which underlies most public policy discussions, presumes that incumbents and entrants have the same cost function and the same underlying technology.¹⁰² Under this theory, there is not enough room in the market for more than one firm, and an entrant could add little to productive capacity.¹⁰³ It is unrealistic, however, to assume that the incumbent and the entrant will employ the same technology.¹⁰⁴ Given the rapid pace of technological change in telecommunications, an entrant can operate a network with a different configuration than the incumbent’s. For example, an incumbent might operate a traditional telecommunications network with twisted copper wire—a century-old technology—while an entrant might offer wireless service. Other transmission technologies including coaxial cable television systems, fiber-optic cable, various land-based wireless systems, and satellite-based systems, have different cost and performance properties. Transmission networks’ various functions, including telephony, mobile communications, data transmission, and video, suggest that differ-

¹⁰⁰ See Harold Demsetz, *Why Regulate Utilities?*, 11 J.L. & ECON. 55, 56–57 (1968) (arguing that, with enough bidders and absent collusion, periodic auctioning of monopoly franchises can yield competitive pricing); Richard A. Posner, *The Appropriate Scope of Regulation in the Cable Television Industry*, 3 BELL J. ECON. 98, 110–13 (1972) (applying Demsetz’s analysis to the cable television market and critiquing the emerging pattern of regulation); Mark A. Zupan, *The Efficacy of Franchise Bidding Schemes in the Case of Cable Television: Some Systemic Evidence*, 32 J.L. & ECON. 401 (1989). But see Oliver E. Williamson, *Franchise Bidding for Natural Monopolies—In General and with Respect to CATV*, 7 BELL J. ECON. 73, 90–91 (1976) (challenging Posner’s proposal).

¹⁰¹ See, e.g., WILLIAM J. BAUMOL ET AL., *CONTESTABLE MARKETS AND THE THEORY OF INDUSTRY STRUCTURE* 6–7 (1982).

¹⁰² See, e.g., *id.* at 17 (defining natural monopoly as an industry in which all of the firms have the same cost function).

¹⁰³ See *id.* at 4–8.

¹⁰⁴ See Spulber, *Deregulating*, *supra* note 94, at 34–41.

ent transmission technologies are suited to different uses.¹⁰⁵ As a result, entrants that offer specialized networks targeted to particular applications are likely to utilize different technologies than the incumbent. Moreover, the entrant can target specialized market segments without duplicating the incumbent's system.¹⁰⁶ Competition from Internet telephony, cable telephony, and wireless provides alternatives to the traditional telephone system. Thus, competitive markets for network services can form, and market prices continue to be an accurate measure of value.

2. *Sunk Costs*

The substantial sunk costs in establishing telecommunications networks, particularly the traditional wireline network, do not prevent markets from allocating network services or prevent market prices from representing an accurate measure of value. Sunk costs are present in most industries, to an extent, and are generally accepted as reasonable business risks with few implications on the performance of market transactions. For example, expenditures for research, development, and marketing are generally regarded as sunk investments. Moreover, most forms of manufacturing entail sunk costs in the form of capital equipment, whether used for manufacturing automobiles or extracting crude oil. These costs in no way prevent market allocation of the end products. In other words, the method of manufacture does not alter the ability of market transactions to allocate a good or service. The telecommunications industry works similarly, although it requires nonrecoverable expenditures in plant and equipment—namely wires and switches.

Commentators and judges often argue that sunk costs prevent competition in telecommunications services and hence cause market failure.¹⁰⁷ In particular, sunk costs are an entry barrier if entrants need to make irreversible investments in capacity while incumbents have already incurred these costs.¹⁰⁸ These commentators and judges

¹⁰⁵ See *id.* at 47–49.

¹⁰⁶ See Spulber, *supra* note 93, at 477; Spulber, *Deregulating*, *supra* note 94, at 47–49.

¹⁰⁷ On the view that sunk costs constitute a barrier to entry, see BAUMOL ET AL., *supra* note 101, at 291–92; William J. Baumol & Robert D. Willig, *Fixed Cost, Sunk Cost, Entry Barriers and Sustainability of Monopoly*, 96 Q.J. ECON. 405, 418–19 (1981); see also Victor P. Goldberg, *Regulation and Administered Contracts*, 7 BELL J. ECON. 426, 432–36 (1976) (arguing that sunk costs justify regulatory intervention). For the argument that sunk costs create a barrier to entry in the telecommunications industry, see *United States v. W. Elec. Co.*, 673 F. Supp. 525, 538 (D.D.C. 1987), *aff'd in part, rev'd in part*, 900 F.2d 283 (D.C. Cir. 1990); Jerry A. Hausman, *Competition in Long-Distance and Telecommunications Equipment Markets: Effects of the MFJ*, 16 MANAGERIAL & DECISION ECON. 365, 367 (1995). But see David L. Kaserman & John W. Mayo, *Competition in the Long-Distance Market*, in HANDBOOK OF TELECOMMUNICATIONS ECONOMICS, *supra* note 93, at 509, 520–21 (criticizing Hausman's conclusions).

¹⁰⁸ See, e.g., *Verizon Communications, Inc. v. FCC*, 535 U.S. 467, 546–47 (2002).

argue that the incumbent need only price goods or services to recover operating expenses and incremental capital expenditures, because it has already overcome the irreversible investment costs of entry.¹⁰⁹ An entrant, in contrast, must anticipate earnings exceeding operating costs, incremental investment, and the irreversible costs of establishing its facilities before deciding to enter.¹¹⁰ Richard Posner points out, however, that nonrecurring costs of entry are “irrelevant if there are small firms in the market that can grow to be large firms.”¹¹¹ Moreover, “there is grave doubt whether there are important non-recurring costs of entry—barriers to entry in the true sense.”¹¹² Posner further notes that the capital required for entry is not a barrier because this cost should be comparable to that of firms already in the market.¹¹³

Potential entrants into an industry have many ways to reduce the risks associated with nonrecoverable expenditures, including contracting with customers before making irreversible investments and entering into joint ventures or mergers with incumbents.¹¹⁴ Furthermore, in competitive markets, duplication of investment often occurs. The entry of excess or insufficient capacity can take place as a consequence of uncertainty regarding costs, technology, or market demand. Temporary overcapacity is part of the competitive process and certainly does not indicate the presence of market failure. Indeed, periods of excess capacity, often observed in a variety of industries, demonstrate that sunk costs are unlikely to deter vigorous competition. The same reasoning applies to the telecommunications industry—in the absence of regulatory intervention that favors or penalizes incumbents.

Technological change further mutes the impact of sunk costs on entrants. Entrants commit capital resources in those markets or market segments in which they expect to earn competitive returns on their investments. The sunk costs involved in establishing a telecommunications system, given currently available technologies, are no different from irreversible investments in any other competitive market. Concern over sunk costs in telecommunications may be due to the substantial level of investment needed to establish a traditional telecommunications network, in particular due to the ubiquity of the reg-

¹⁰⁹ See, e.g., Baumol & Willig, *supra* note 107, at 418–19. According to George Stigler, barriers to entry are long-run costs that are imposed on entrants but not on incumbents. STIGLER, *supra* note 92, at 67.

¹¹⁰ See Baumol & Willig, *supra* note 107, at 418–19.

¹¹¹ RICHARD A. POSNER, *ANTITRUST LAW: AN ECONOMIC PERSPECTIVE* 92 (1976).

¹¹² *Id.*

¹¹³ See *id.*

¹¹⁴ The following discussion is based on SPULBER, *supra* note 97, at 610–24, and Spulber, *Deregulating*, *supra* note 94, at 46–49.

ulated Bell System monopoly. This is a quantitative difference but hardly a qualitative one; entrants can invest smaller amounts to create networks targeted at particular customers and specific services.

As in natural monopoly analysis, the argument that sunk costs are a barrier to entry also depends in part on the similarity of the incumbent's and entrant's technology. Yet, an entrant need not duplicate the incumbent's network. An entrant with lower operating costs could be assured of recovering at least the difference between the incumbent's operating costs and the entrant's own operating costs, which could well be sufficient to recover the costs of entry. This scenario is likely because technological change in telecommunications, such as the application of microprocessors in switching, potentially lowers the costs of operating networks. By differentiating its offerings through branding, customer service, and location, an entrant gains incremental revenues to cover the costs of entry. New technologies offer enhanced performance, such as the mobility of wireless services and the increased bandwidth of coaxial and fiber-optic systems, thus allowing competition with established networks.

Technological change has even altered the need to sink costs into a telecommunications network. For example, wireless technologies avoid customer-specific, irreversible investment for the "last mile" to the customer's location, because wireless transmission towers can be relocated. Thus, even if substantial sunk costs are required to reproduce the incumbent's wireline network, a wireless alternative may be an effective competitor without the same sunk costs. Accordingly, sunk costs in telecommunications need not impede the market allocation of telecommunications services.

3. *Interconnection and Network Economic Effects*

Although network compatibility and interconnection confer clear benefits, these benefits do not prevent markets from allocating network services so that market prices continue to be an accurate measure of value. Network interconnection is necessary for a call placed by a customer served by one network to reach a customer served by another network. Because the number of connections enhances the value of a network, interconnection is in the interest of network operators.

Network industries typically require an extensive set of interconnections. Local networks have access to most, if not all, long distance and international networks. Wireless services connect to both local and long distance networks. Customers can access the Internet through local telecommunications networks, wireless systems, digital subscriber lines (DSL), and broadband cable. The Internet—itself a network of networks—represents a vast number of interconnections.

The terms of such interconnections are established through market agreements and through regulated charges. Given this set of interconnection agreements, access to the services of a network implicitly entails access to the connections offered by the network. Customers may obtain some of these connections as part of the network service, or they may pay for individual connections, just as retail telecommunications customers purchase local and long-distance services separately. Accordingly, network interconnectivity enhances the ability of competitive firms to provide network services, and does not conflict with market pricing of these services.

At the same time, a growing number of scholars have raised the concern that network owners may be able to use interconnection (or, more accurately, the refusal to interconnect) as an anticompetitive weapon.¹¹⁵ These concerns center on the fact that many networks determine their value by the number of people connected to them. The classic example is the telephone system,¹¹⁶ because the more people with whom one can communicate through a particular network, the more valuable that network becomes. Therefore, the value of network access depends not only on the access price charged, but also on the number of users with access to the network. Economic literature refers to this characteristic as a *network economic effect*.¹¹⁷

Some economists consider network economic effects to be a kind of *externality*.¹¹⁸ Proponents of this view suggest that network users' inability to capture all of the benefits generated by their usage repre-

¹¹⁵ See, e.g., Michael L. Katz & Carl Shapiro, *Network Externalities, Competition, and Compatibility*, 75 AM. ECON. REV. 424, 436 (1985). For an argument that network externalities may justify regulation against monopolies in telecommunications, see WILLIAM H. MELODY, BUILDING THE REGULATORY FOUNDATIONS FOR GROWTH IN NETWORK ECONOMIES 6 (World Dialogue on Regulation for Network Economies, Discussion Paper No. 0201, 2002), at <http://regulateonline.org/pdf/wdr0201.pdf>.

¹¹⁶ As one group of commentators has noted:

Telecommunications is a network industry with the characteristics of a club. Both the cost of, and the value of, club membership depend on the number of subscribers. Access to the network is the telecommunications equivalent of club membership. A new member of the club provides benefits to existing members who can now call an additional subscriber. This means the private value of membership will differ from the social value. The existence of such "network externalities" gives rise to a prima facie case for subsidisation of new membership.

ROBERT ALBON ET AL., TELECOMMUNICATIONS ECONOMICS AND POLICY ISSUES 53 (GOVT. OF AUSTRALIA, Productivity Commission Staff Information Paper, 1997), at <http://www.pc.gov.au/ic/research/information/teleeco/teleeco.pdf>. The report continues: "However, the consensus in the literature is that the network externality is no longer an important issue for basic telecommunications services." *Id.*

¹¹⁷ See generally Mark A. Lemley & David McGowan, *Legal Implications of Network Economic Effects*, 86 CAL. L. REV. 479 (1998) (reviewing the economic literature).

¹¹⁸ See, e.g., Katz & Shapiro, *supra* note 115, at 424; Michael L. Katz & Carl Shapiro, *Systems Competition and Network Effects*, J. ECON. PERSP., Spring 1994, at 93, 96-100 [hereinafter Katz & Shapiro, *Systems Competition*].

sents a positive externality that will cause overall network utilization to drop below efficient levels.¹¹⁹ These theorists also suggest that network externalities can turn network access into a competitive weapon. By refusing to interconnect with other networks, network owners can force users to choose one network to the exclusion of others. Forcing users to commit to one network naturally leads users to flock to the largest network, thus creating or reinforcing a monopoly position.¹²⁰

The classic example of this phenomenon is the development of the Bell System. During the latter part of the nineteenth century, the Bell Telephone Company was able to use its initial telephone patents to establish a near monopoly over local telephone service.¹²¹ The expiration of those initial patents in the 1890s allowed competition to emerge that caused the Bell System's market share to be cut in half. The Bell System attempted to reassert its dominance by refusing to interconnect with these upstarts. This effort ultimately failed, because the independent companies that comprised the other half of the industry were able to forestall any negative network economic effects by allying with one another to form a network similar in size to the Bell network. The Bell System changed course and instead refused to allow independent phone companies access to certain patents that were essential to providing improved long distance service. Once it reemerged as the dominant player, Bell was able to use its refusal to interconnect to forestall the emergence of meaningful competition.¹²²

In addition, some scholars argue that network effects can adversely affect technological adoption and product selection decisions. In this view, network externalities can cause a different market failure, known as technology lock-in, in which markets adhere to previous technology commitments notwithstanding the arrival of new, more efficient network technologies.¹²³ If users cannot capture all of the benefits created by their adoption of new technology, they may refrain from making a technological change, even when doing so would increase total welfare. The most commonly cited example of this phe-

¹¹⁹ See Katz & Shapiro, *Systems Competition*, *supra* note 118, at 100.

¹²⁰ See *id.* at 110–11.

¹²¹ See Roger G. Noll & Bruce M. Owen, *The Anticompetitive Uses of Regulation: United States v. AT&T*, in *THE ANTITRUST REVOLUTION* 290, 291 (John E. Kowka, Jr. & Lawrence J. White eds., 1989).

¹²² See *id.* at 291–92.

¹²³ See, e.g., Joseph Farrell & Garth Saloner, *Installed Base and Compatibility: Innovation, Product Preannouncements, and Predation*, 76 *AM. ECON. REV.* 940, 941–43 (1986); Katz & Shapiro, *Systems Competition*, *supra* note 118, at 108; see also THOMAS C. SCHELLING, *MICROMOTIVES AND MACROBEHAVIOR* 92–96 (1978) (identifying the effects of what he calls *critical mass* on many types of economic and social behavior); H. Leibenstein, *Bandwagon, Snob, and Veblen Effects in the Theory of Consumer's Demand*, 64 *Q.J. ECON.* 183, 190–99 (1950) (describing the effects of perception of other consumers' desires in consumers' behavior).

nomenon is the persistence of the conventional typewriter and keyboard layout (called *QWERTY*, after the arrangement of letters in the upper left-hand corner), despite the emergence of the supposedly more efficient Dvorak keyboard layout.¹²⁴ Another example is the emergence of VHS as the standard format for videocassettes, despite the supposed technical superiority of the Beta format.¹²⁵ These considerations have led some to argue that compelled access is necessary to ensure that the early leaders in any network technology, as well as the owners of large networks, do not use their position to stifle technological innovation.¹²⁶ They also lead some commentators to ask whether basing access rates on market prices would in fact promote efficiency.

These arguments suggest that network industries may be uniquely susceptible to market failures that may prevent the price mechanism from playing its usual role in generating efficient outcomes. If network externalities prevent markets from functioning efficiently, then it might follow that the market equilibrium price of network access somehow is distorted as well.¹²⁷

Although formal models developed by proponents of the network externality view have demonstrated that such market failures are possible, we believe that claims of widespread market failure are exaggerated. A critical review of the economic literature reveals that network externality theories are subject to several conceptual limitations. Theoretical models simply demonstrate that a particular type of market failure is *possible*. Determining whether such a market failure is *likely* depends upon a close empirical evaluation of whether the preconditions underlying any particular theory actually exist. To date, network externality theorists have been unable to establish that any of the classic examples of supposed technology lock-in are either true or can properly be regarded as cases of market failure. Moreover, widespread innovation, in a variety of industries casts serious doubt on the lock-in story. Technological change is certainly evident in telecommunications. Indeed, the existence of multiple competing platforms strongly suggests that technologies in network industries are not locked in, but rather easily superseded. Finally, proponents of the network externality view must decide whether the cure is worse than

¹²⁴ See, e.g., Paul A. David, *Clio and the Economics of QWERTY*, AM. ECON. REV., May 1985, at 332; JEAN TIROLE, THE THEORY OF INDUSTRIAL ORGANIZATION 405 n.40 (1988); Farrell & Saloner, *supra* note 123, at 941–42.

¹²⁵ See, e.g., W. Brian Arthur, *Positive Feedbacks in the Economy*, SCI. AM., Feb. 1990, at 92, 92–93.

¹²⁶ See Jerry A. Hausman et al., *Cable Modems and DSL: Broadband Internet Access for Residential Customers*, AM. ECON. REV., May 2001, at 302, 306–07; Mark A. Lemley & Lawrence Lessig, *The End of End-to-End: Preserving the Architecture of the Internet in the Broadband Era*, 48 UCLA L. REV. 925, 934–38, 940–42 (2001).

¹²⁷ See Katz & Shapiro, *Systems Competition*, *supra* note 118, at 98–100.

the disease. In other words, resolution of the regulatory question depends not just on whether a market failure exists, but also on whether government intervention is likely to do better than private ordering.

a. *Network Economics as a Source of Market Failure*

As noted above, theories that rely on the supposed presence of network externalities to justify more intrusive regulation of network industries suffer from several conceptual shortcomings.¹²⁸ On closer inspection, it becomes clear that the argument that network externalities entrench incumbents and existing technologies is too simplistic. As Joseph Farrell and Garth Saloner point out, a consumer's adoption of a new technology is subject to two distinct and countervailing effects. First, the decision to adopt a new technology enhances the value of the new network for current users as well as future users of the new network. This effect might cause markets to become locked into obsolete technologies, a phenomenon that Farrell and Saloner refer to as "excess inertia."¹²⁹

At the same time, however, the adoption of a new technology may reduce the number of people using the old technology, thereby reducing its value. In effect, adoption of the new technology tends to strand the installed base in the old technology. Individuals who adopt a new technology thus do not fully internalize all of the costs created by their actions. This phenomenon may cause an individual to adopt a new technology even if the societal costs outweigh the benefits, a situation known as "excess momentum"¹³⁰ or "insufficient friction."¹³¹ It is thus theoretically possible that the presence of network economic effects may prevent network providers from realizing all of the available economies of scale and may accelerate the pace at which consumers adopt new technologies. Whether network externalities would in fact cause market failure thus depends upon which of these two countervailing effects dominates.¹³²

¹²⁸ The discussion that follows is based in part on Yoo, *supra* note 11, at 278–82.

¹²⁹ See Farrell & Saloner, *supra* note 123, at 941.

¹³⁰ *Id.* at 942.

¹³¹ Michael L. Katz & Carl Shapiro, *Product Introduction with Network Externalities*, 40 J. INDUS. ECON. 55, 73 (1992).

¹³² The literature refers to the type of network effects we are discussing as *direct network externalities*, which are those generated "through a direct physical effect of the number of purchasers on the quality of the product." Katz & Shapiro, *supra* note 115, at 424. The leading example is the number of subscribers attached to a telephone network. See *id.* With *indirect network externalities*, in contrast, there is no direct connection. Instead, the value of a good is determined by the number of other people who purchase the same good. Commonly cited examples include the selection of a video cassette recorder (VCR) format and the use of a particular type of software or operating system. See S.J. Liebowitz & Stephen E. Margolis, *Are Network Externalities a New Source of Market Failure?*, 17 RES. LAW & ECON. 1, 3 (1995) [hereinafter Liebowitz & Margolis, *Market Failure*]; S.J. Liebowitz & Stephen E. Margolis, *Network Externality: An Uncommon Tragedy*, J. ECON. PERSP., Spring 1994, at

In addition, the economic literature underscores the importance of examining in detail the structure of the relevant market before relying on network economic effects to justify regulatory intervention. The market failures identified by the formal network economic models tend to depend on the assumption that the relevant markets are either dominated by a single firm or highly concentrated. The clear implication from these models is that the presence of competition is likely sufficient to mitigate any such problems. In fact, the Bell System's failed initial attempt to use network economic effects to forestall competition¹³³ suggests that the presence of a single competitor of roughly the same size as the network owner may eliminate such market failures. As we will discuss in considerable detail,¹³⁴ the markets described in this Article are not likely concentrated enough to fall within the ambit of these models.

The economic literature indicates that regulation of network externalities is unnecessary, because private ordering can easily resolve economic problems that may arise. Any network externalities that may exist in the examples upon which we are focusing will necessarily occur within a physical network that can be owned. Thus, although individual users may not be in a position to capture all of the benefits created by their demand for network services, the network owner will almost certainly be in a position to do so.¹³⁵ With a single network owner, the problems associated with this type of externality can be solved in the same manner as externality problems in other contexts—by placing property in the hands of a single owner and protecting it with well-defined property rights.¹³⁶ Benefits created by network participation can thus be internalized and allocated through the interaction between the network owner and network users.¹³⁷

Relying on unitary ownership of a network to internalize any network externalities that may exist does not necessarily mean that com-

133, 135 [hereinafter Liebowitz & Margolis, *Uncommon Tragedy*]; see also Joseph Farrell & Garth Saloner, *Standardization, Compatibility, and Innovation*, 16 RAND J. ECON. 70, 70–71 (1985) (contrasting direct network externalities with market-mediated effects). Note that to the extent that key network elements receive some degree of patent, copyright, or trademark protection, it is conceivable that the use of well-defined property rights may solve some types of indirect network externalities. See Liebowitz & Margolis, *Market Failure*, *supra*, at 11. Because all of the networks that form the focus of this Article are physical networks, any network externalities that may exist with respect them are necessarily direct network externalities.

¹³³ See *supra* notes 120–22 and accompanying text.

¹³⁴ See *infra* Part III.A.2, B.2, C.2.

¹³⁵ See Liebowitz & Margolis, *Market Failure*, *supra* note 132, at 10–14; Liebowitz & Margolis, *Uncommon Tragedy*, *supra* note 132, at 141–44.

¹³⁶ See R.H. Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1 (1960); Garrett Hardin, *The Tragedy of the Commons*, 162 SCIENCE 1243 (1968).

¹³⁷ See Liebowitz & Margolis, *Market Failure*, *supra* note 132, at 10–14; Liebowitz & Margolis, *Uncommon Tragedy*, *supra* note 132, at 137, 141–44.

petition cannot emerge. In many cases, a network need not occupy the entire market in order to realize a sufficient proportion of the available demand-side economies of scale.¹³⁸ When this occurs, no unexploited gains from trade regarding network size remain, and the equilibrium solution is competition among multiple proprietary networks. The point can be illustrated through the now classic problem presented by overfishing of a lake. Because individual anglers do not internalize all of the costs of their actions, they lack sufficient incentives to undertake efficient levels of conservation and investment.¹³⁹ The solution is to internalize network externalities by vesting property rights to the entire lake in a single owner.¹⁴⁰ Moreover, unitary ownership will not necessarily eliminate competition in the fish market. Because owners with unitary property rights over a particular lake will not have control over all lakes, the various owners of different lakes will continue to compete with one another.¹⁴¹ With networks, the proper policy question becomes one of defining property rights in a way that insures that networks achieve sufficient size to realize enough of the available network economies. This does not necessarily mean that a single network will emerge, with government involvement required to ensure the network is the “right” one.¹⁴²

¹³⁸ See STAN J. LIEBOWITZ & STEPHEN E. MARGOLIS, *WINNERS, LOSERS & MICROSOFT* 70–71 (1994).

¹³⁹ See *id.* at 74–76.

¹⁴⁰ See *id.*

¹⁴¹ See *id.*

¹⁴² See Liebowitz & Margolis, *Uncommon Tragedy*, *supra* note 132, at 140–42; see also Liebowitz & Margolis, *Market Failure*, *supra* note 132, at 14–15 (describing how the assumptions embodied in formal models of network externalities in effect assume away this problem by positing inexhaustible economies of scale).

Indirect network externalities pose a somewhat different problem, because the lack of a direct physical connection among users means that policy makers cannot simply rely on network ownership to internalize the relevant externalities. To date, scholars have focused on two facts: (1) indirect network externalities typically arise in markets that involve complementary goods, and (2) proprietary control of a network can provide users with some assurance that a ready supply of complementary goods will remain available. See Katz & Shapiro, *Systems Competition*, *supra* note 118, at 101–04; James B. Speta, *Handicapping the Race for the Last Mile?: A Critique of Open Access Rules for Broadband Platforms*, 17 *YALE J. ON REG.* 39, 83 (2000).

Although true to an extent, these facts do not shed light on the more fundamental analytical deficiencies underlying theories of market failure based on indirect network externalities. Specifically, indirect network externalities primarily affect inframarginal network users. Therefore, although charging higher prices to inframarginal users has distributional consequences, it has no impact on efficiency, because equilibrium price and quantity are determined solely by the decisions of the marginal network user. See Liebowitz & Margolis, *Market Failure*, *supra* note 132, at 4–5; Liebowitz & Margolis, *Uncommon Tragedy*, *supra* note 132, at 136–37. Furthermore, it is often difficult to distinguish an indirect network externality from the results of a properly functioning market, because any drop in prices may represent nothing more than technological change or the fact that the purchases are occurring in a declining cost industry. If so, the drop in price would simply reflect movement along the cost curve rather than a deviation from the cost curve caused

Even assuming that network externalities that tend to cause monopolistic dominance and technology lock-in actually exist, other features of the market and the structure of consumers' preferences might mitigate, if not eliminate, these adverse effects. For example, after networks have captured a sufficient number of subscribers, the marginal benefit from adding another subscriber is likely to be low, reducing or eliminating network effects and mitigating any potential externality.¹⁴³ The market may also dislodge an existing network technology as long as the additional value provided by the new technology exceeds the value of the network externalities supporting the old technology.¹⁴⁴ As Professors Kaplan and Ramseyer succinctly put it, "an entrenched inefficient technology is potentially a twenty-dollar bill lying on the sidewalk."¹⁴⁵

In addition, network externalities may be substantially mitigated if user preferences are nonuniform. As Professors Katz and Shapiro have noted:

Consumer heterogeneity and product differentiation tend to limit tipping and sustain multiple networks. If the rival systems have distinct features sought by certain consumers, two or more systems may be able to survive by catering to consumers who care more about product attributes than network size. Here, market equilibrium with multiple incompatible products reflects the social value of variety.¹⁴⁶

by an externality. See Liebowitz & Margolis, *Market Failure*, *supra* note 132, at 7–9; Liebowitz & Margolis, *Uncommon Tragedy*, *supra* note 132, at 138–39. In such situations, there is no efficiency loss to be abated. Any remedies imposed in the name of compensating for a network externality would thus be the cause of, rather than the solution to, market failure. Even worse, the true source of the decline in cost may lie in one of the input markets rather than the output market. Positing that the problem is an indirect network externality operating in the output market may thus prompt an incorrect policy response by focusing attention away from the input markets that may be the true locus of whatever market failure may exist. See Liebowitz & Margolis, *Market Failure*, *supra* note 132, at 9–10.

¹⁴³ See ALBON, *supra* note 116, at 53; BRIDGER M. MITCHELL & INGO VOGELSANG, TELECOMMUNICATIONS PRICING: THEORY AND PRACTICE 55 (1991); A. de Fontenay & J.T. Marshall Lee, *BC/Alberta Long Distance Calling*, in ECONOMIC ANALYSIS OF TELECOMMUNICATIONS: THEORY AND APPLICATIONS 199, 208 (Léon Courville et al. eds. 1983); George Yartow, *Dealing with Social Obligations in Telecoms*, in REGULATING UTILITIES: A TIME FOR CHANGE? 67, 75 (S. Sayer et al. eds., 1996).

¹⁴⁴ See Katz & Shapiro, *Systems Competition*, *supra* note 118, at 106 (observing that new, incompatible standards may emerge despite the presence of network externalities if "consumers . . . care more about product attributes than network size"); S.J. Liebowitz & Stephen E. Margolis, *The Fable of the Keys*, 33 J.L. & ECON. 1, 4 (1990) (noting that the "greater the gap in performance between two standards . . . the more likely that a move to the efficient standard will take place"), *reprinted in* FAMOUS FABLES OF ECONOMICS 90, 92 (Daniel F. Spulber ed., 2002), and in LIEBOWITZ & MARGOLIS, *supra* note 138, at 19, 21–22.

¹⁴⁵ Steven N. Kaplan & J. Mark Ramseyer, *Those Japanese Firms with Their Disdain for Shareholders: Another Fable for the Academy*, 74 WASH. U. L.Q. 403, 405 (1996).

¹⁴⁶ Katz & Shapiro, *supra* note 115, at 106 (citing Joseph Farrell & Garth Saloner, *Standardization and Variety*, 20 ECON. LETTERS 71, 71–74 (1986)); S.J. Liebowitz & Stephen E. Margolis, *Should Technology Choice Be a Concern of Antitrust Policy?*, 9 HARV. J.L. & TECH.

The existence of large network users may further mitigate any problems caused by network economic effects. If a single user controls a significant portion of the network, then that user would be able to internalize more of the benefits of any technological changes, which would help minimize any slippage caused by the existence of the network externality.¹⁴⁷ Furthermore, because large users can capture a disproportionate share of the benefits from the adoption of new technology, they have a significant incentive to make the investments needed to begin the shift towards the new technology.¹⁴⁸ Indeed, formal models of such market structures indicate that “the sponsor of a new technology earns greater profits than its entry contributes to social welfare. In other words, markets with network externalities in which new technologies are proprietary exhibit a bias towards new technologies.”¹⁴⁹ Far from being a bane, the existence of large network players may be a blessing in disguise.

In addition, significant growth in market size can render network externalities irrelevant.¹⁵⁰ If a market is undergoing substantial growth, market outcomes are determined by the commitments that future users will make, not by the decisions of the users who have already committed to a particular technology.¹⁵¹ In such cases, the fact that a particular firm may currently dominate a market is of little consequence. Those who are concerned about lock-in should focus on the future network, not the existing one.

Finally, it is important to recognize that the adoption of a new technology carries significant costs. The standardization associated with established technology can create real benefits by facilitating compatibility between complementary products. These benefits would be lost if a new technology were adopted. Changes in technology also impose significant transaction costs, because it can be costly to produce new technological platforms and adapt existing network infrastructure to incorporate innovations.¹⁵² Accordingly, some delay

283, 292 (1996) (“Where there are differences in preferences regarding alternative standards, coexistence of standards is a likely outcome.”).

¹⁴⁷ See Katz & Shapiro, *Systems Competition*, *supra* note 118, at 102–03.

¹⁴⁸ See Liebowitz & Margolis, *Market Failure*, *supra* note 132, at 11, 13. The fear of delays after committing to a network might make consumers reluctant to join proprietary networks. Katz and Shapiro describe a number of ways that a network owner can allay such fears. See Katz & Shapiro, *Systems Competition*, *supra* note 118, at 104–05, 107.

¹⁴⁹ Katz & Shapiro, *supra* note 131, at 73.

¹⁵⁰ See *id.* at 67, 73 (concluding that exponential market growth effectively prevents excess inertia); Liebowitz & Margolis, *supra* note 146, at 292 (“Entrenched incumbents are less entrenched when consumers react to new sales . . .”).

¹⁵¹ See Liebowitz & Margolis, *supra* note 146, at 312.

¹⁵² Timothy F. Bresnahan, *New Modes of Competition: Implications for the Future Structure of the Computer Industry*, in *COMPETITION, INNOVATION AND THE MICROSOFT MONOPOLY: ANTI-TRUST IN THE DIGITAL MARKETPLACE* 155, 200 (Jeffrey A. Eisenach & Thomas M. Lenard eds., 1999).

in the introduction of new products may reflect efficiency, not market failure. Absent a compelling reason to believe that network externalities are causing efficiency losses that the market cannot properly redress, regulations designed to counteract network economic effects cannot be justified.

b. *The Empirical Support for Network Induced Market Failures*

The fact that markets seem capable of resolving most of the supposed market failures identified by network economics literature suggests that any attempt to remedy these supposed problems should be approached with considerable caution. Indeed, it seems appropriate to insist on empirical proof that such problems actually exist before authorizing governmental action to redress them. Proponents of network externality theories have yet to offer any systematic empirical support for their theories. Instead, most of these theorists have opted to invoke a handful of well-known anecdotes concerning supposed technology lock-in.¹⁵³

This lack of systematic evaluation has allowed proponents of network externality theories to be maddeningly imprecise about what constitutes lock-in. Even the term—"lock-in"—is ambiguous in that no technological standard is permanent and that over a long enough time, all technological standards are subject to change. Whether a technology has become locked-in is thus largely a function of the period of time deemed relevant for evaluating technological change. Therefore, the concept of lock-in, as currently employed in the economics literature, obscures any empirical attempt to verify its existence.

Furthermore, close analysis of the historical record reveals that none of the key examples that form the empirical basis for the network externality theory can properly be considered market failures. Specifically, the evidence suggests that the *QWERTY* keyboard does not represent an obsolete technology locked into place by network externalities. On the contrary, it appears that the *QWERTY* keyboard first emerged as the winner of a vibrant competition on the merits, in which various keyboard designs were tested against one another in a series of typing contests.¹⁵⁴ In addition, the evidence demonstrating the Dvorak keyboard's superiority is riddled with conflicts of interest, because Dvorak himself conducted all of the key studies, including U.S. Navy tests that represent the primary support for these claims. Modern ergonomic studies suggest that any technical difference between the *QWERTY* and the Dvorak keyboards is nominal.¹⁵⁵

¹⁵³ See *supra* notes 123–25 and accompanying text.

¹⁵⁴ See Liebowitz & Margolis, *supra* note 144, at 17–21.

¹⁵⁵ See *id.* at 8–15.

The historical record also belies any suggestion that VHS's emergence as the prevailing standard for videocassettes represents the perseverance of an obsolete technology. Rather, the evidence suggests that the competition between Beta and VHS turned on a design trade-off, with Beta incorporating a smaller cassette in order to enhance portability and VHS opting for a larger cassette in order to provide for longer playing and recording times.¹⁵⁶ VHS's victory over Beta thus seems to have resulted from consumers' preference for videotapes capable of recording a two-hour movie on a single cassette, rather than from a market failure that frustrated the efficient outcome. In fact, any suggestion that VHS's victory was the result of inefficient lock-in effects is contradicted by the fact that Beta was deployed first and was the early leader in VCR technology.¹⁵⁷ Thus, the outcome is more properly regarded as an example of how markets can use differences in product value and an expanding customer base to displace an existing technology rather than an example of lock-in.

Other anecdotal examples upon which network externality theorists rely have faced similar criticism.¹⁵⁸ Moreover, the many circumstances in which new technologies have displaced firmly entrenched technologies further undercut network externality theory. For example, compact discs have displaced vinyl and cassette recordings, and the digital video disc (DVD) format is in the process of displacing the VHS format. In short, the empirical record provides little reason to believe that networks are so prone to market failure so as to justify more intrusive regulation than in any other type of industry. If anything, the history of technological change suggests the contrary. Therefore, regulators should exercise considerable caution in evaluating claims of market failures caused by network economic effects when those claims are not backed by firm empirical support.

c. *The Limits of Regulation as a Solution to Market Failure*

Finally, even if the necessary empirical preconditions for network-induced market failure were present, regulatory intervention would not necessarily improve matters. As noted earlier, government-imposed solutions often fall short of efficient outcomes, even when they are implemented to correct a market failure.¹⁵⁹ Not only can a regulatory access regime harm allocative efficiency if access prices are set at inefficient levels, regulation can also harm dynamic efficiency by caus-

¹⁵⁶ See LIEBOWITZ & MARGOLIS, *supra* note 138, at 122–23, reprinted in FAMOUS FABLES OF ECONOMICS, *supra* note 144, at 112–13.

¹⁵⁷ See S.J. Liebowitz & Stephen E. Margolis, *Path Dependence, Lock-In, and History*, 11 J.L. ECON. & ORG. 205, 219–20 (1995).

¹⁵⁸ See LIEBOWITZ & MARGOLIS, *supra* note 138, at 127–32, reprinted in FAMOUS FABLES OF ECONOMICS, *supra* note 144, at 116–21.

¹⁵⁹ See *supra* notes 27–30 and accompanying text.

ing investment incentives to fall below efficient levels and by creating de facto entry barriers.¹⁶⁰ Thus, regulators confronting a market failure must ask themselves the logically subsidiary question whether government intervention is likely to improve matters or make them worse.

Consider, for example, the particular regulatory decisions associated with any state-sponsored attempt to solve the problems of technological lock-in. Such intervention would necessarily require the government to replace clear winners in the technology marketplace with what it believed to be the superior technology.¹⁶¹ Moreover, in order to be effective, the government must intervene at an early stage in the technology's development, when making such determinations is most difficult.¹⁶² Regulators typically would have to assess technological superiority on the basis of extremely thin information that in most cases would be provided by parties with a direct interest in the outcome of the regulatory process.¹⁶³ In addition, decision makers would have to insulate themselves from the types of systematic biases traditionally associated with political decision making.¹⁶⁴ Thus, even supporters of network externality theories caution that government intervention might well make the problem worse instead of better.¹⁶⁵

In short, there is ample reason to be skeptical of claims that network economic effects will cause widespread market failure in network industries. Not only are such claims problematic as a theoretical matter, but they also appear to be essentially devoid of any empirical support. Thus, there appears to be little justification for the belief that basing access rates on actual market transactions would lead to inefficient outcomes. On the contrary, basic economic principles indicate that market-based pricing represents the most appropriate way for rate-making authorities to ensure that access rates are set at levels that promote both allocative and dynamic efficiency. Two fundamental transformations—the emergence of platform competition and the shift to access regulation—made direct, facilities-based competition feasible. As a result, the only plausible explanation for failing to implement market-based access rates—that the absence of technological

¹⁶⁰ See *supra* notes 27–30 and accompanying text. Under rate regulation—the traditional governmental response to market failure—regulators explicitly prohibit competitors from entering the market. Although access regulation does not involve any *de jure* prohibition of market entry, it can forestall the emergence of facility-based competition to existing networks by rescuing users from having to invest alternative capacity. See *supra* notes 28–29 and accompanying text.

¹⁶¹ See Bresnahan, *supra* note 152, at 200.

¹⁶² See *id.*

¹⁶³ See *id.* at 200–01.

¹⁶⁴ See *id.* at 201–03.

¹⁶⁵ See *id.* at 200–03; Katz & Shapiro, *Systems Competition*, *supra* note 118, at 112–13.

substitutes made market-based pricing impossible—has been drained of its vitality.

II

CONSTITUTIONAL LIMITS ON THE PRICING OF ACCESS TO NETWORKS

Just as regulatory authorities have largely failed to recognize the economic significance of both the emergence of platform competition and the shift from rate regulation to access regulation, they have failed also to appreciate that these transformations compel a different constitutional analysis. Because rate regulation simply adjusts the terms under which parties can contract, it represents the type of non-possessory regulation traditionally subjected to a rather permissive standard of review under the Takings Clause.¹⁶⁶ This standard requires only that the rate fall within a zone of reasonableness.¹⁶⁷ Compelling access to a physical network, in contrast, invariably requires the network owner to permit third parties to locate equipment on its property. As such, access regulations are subject to the more restrictive standards associated with the Court's physical takings jurisprudence.¹⁶⁸ Unlike nonpossessory regulations, in which reductions in the value of property are not necessarily compensable, physical takings necessarily command market-value compensation.¹⁶⁹ Principles of constitutional law thus reinforce the basic economic conclusion that network access should be priced at market levels.

A. The Distinction Between Physical and Nonpossessory Takings

1. *The Emergence of Nonpossessory Takings Doctrine*

Initially, the Takings Clause was believed to protect only against direct government appropriations of private property or invasions that effectively divested the owner of possession as though the government formally condemned the property.¹⁷⁰ Government actions that merely reduced property value did not qualify as a taking.¹⁷¹ The

¹⁶⁶ See *infra* notes 242–44, 249 and accompanying text.

¹⁶⁷ See *infra* notes 239–46 and accompanying text.

¹⁶⁸ See *infra* notes 216–17 and accompanying text.

¹⁶⁹ See *infra* Part II.B.2.a.

¹⁷⁰ See, e.g., *Meyer v. City of Richmond*, 172 U.S. 82, 99 (1898) (holding that the deprivation of street access to plaintiff's property did not constitute a taking); *Transp. Co. v. Chicago*, 99 U.S. 635, 642–43 (1878) (holding that city-built dam did not effect a taking, even though it damaged plaintiff's property and temporarily rendered the property worthless). See generally *Tahoe-Sierra Pres. Council, Inc. v. Tahoe Reg'l Planning Agency*, 535 U.S. 302, 325 n.21 (2002) (describing early Takings Clause jurisprudence); *Lucas v. S.C. Coastal Council*, 505 U.S. 1003, 1014 (1992) (same).

¹⁷¹ See *Transp. Co.*, 99 U.S. at 642 (noting that “acts done in the proper exercise of governmental powers, and not directly encroaching upon private property, though their consequences may impair its use, are universally held not to be a taking”); *Legal Tender*

Court subsequently recognized two types of takings that can arise without a physical occupation. First, the Court acknowledged that a rate regulation may effect a taking if the rate is set so low as to be confiscatory.¹⁷² Second, the Court recognized that the government may effect a taking without physical occupation or appropriation if it “goes too far” in limiting the owner’s use of his or her property.¹⁷³

a. *Confiscatory Rate-Making*

Confiscatory rate-making doctrine is rooted in the notion that although regulators may limit the prices that certain industries charge for their services, “it is not to be inferred that this power of limitation or regulation is itself without limit. This power to regulate is not a power to destroy, and limitation is not the equivalent of confiscation.”¹⁷⁴ As a result, the Court acknowledged that the Constitution forbids rates that are set so low as to be confiscatory.¹⁷⁵ Although earlier Court opinions were unclear as to whether confiscatory rate-making doctrine was based on takings or due process principles,¹⁷⁶ subsequent decisions clarified that the doctrine stems from the Takings Clause.¹⁷⁷

The methodology on which a particular rate is based does not determine whether it is confiscatory.¹⁷⁸ Instead, determining whether

Cases, 79 U.S. (12 Wall.) 457, 551 (1871) (holding that the Takings Clause “has never been supposed to have any bearing upon, or to inhibit laws that indirectly work harm and loss to individuals” even if the government action “render[s] valuable property almost valueless”).

¹⁷² See, e.g., *Covington & Lexington Tpk. Rd. Co. v. Sandford*, 164 U.S. 578, 597 (1896) (holding that, in determining the existence of a taking, a court must consider “whether the rates prescribed . . . are . . . so unjust as to destroy the value of [the] property [and thus] practically deprived the owner of property”).

¹⁷³ *Pa. Coal Co. v. Mahon*, 260 U.S. 393, 415 (1922).

¹⁷⁴ *R.R. Comm’n Cases*, 116 U.S. 307, 331 (1886).

¹⁷⁵ See, e.g., *Covington & Lexington Tpk. Rd. Co.*, 164 U.S. at 597; see also *Stone v. Wisconsin*, 94 U.S. 181, 184 (1876) (Field, J., dissenting) (stating that excessively low rates can result in “practical confiscation”); *Munn v. Illinois*, 94 U.S. 113, 142 (1876) (Field, J., dissenting) (“If the legislature of a State . . . can determine, against the consent of the owner, the . . . prices which the owner shall receive for [his private property’s] uses, it can deprive him of the property as completely as by a special act for its confiscation or destruction”).

¹⁷⁶ See, e.g., *R.R. Comm’n Cases*, 116 U.S. at 331 (concluding that confiscatory rate making violated either the Takings Clause or the Due Process Clause, without clarifying which one applied). Interestingly, the Court at times suggested that the prohibition of confiscatory rate making arose under the Equal Protection Clause. See *Covington & Lexington Tpk. Rd. Co.*, 164 U.S. at 592; *St. Louis & S.F. Ry. v. Gill*, 156 U.S. 649, 658, 663 (1895); *Reagan v. Farmers’ Loan & Trust Co.*, 154 U.S. 362, 399 (1894); *Chi., Milwaukee & St. Paul Ry. v. Minnesota ex rel. R.R. & Warehouse Comm’n*, 134 U.S. 418, 458 (1890).

¹⁷⁷ See JAMES W. ELY, JR., *THE CHIEF JUSTICESHIP OF MELVILLE W. FULLER, 1888–1910*, at 104 (1995).

¹⁷⁸ As the Court recently indicated, “an otherwise reasonable rate is not subject to constitutional attack by questioning the theoretical consistency of the method that produced it. ‘It is not theory, but the impact of the rate order which counts.’” *Duquesne Light Co. v. Barasch*, 488 U.S. 299, 314 (1989) (quoting *Fed. Power Comm’n v. Hope Natural Gas Co.*, 320 U.S. 591, 602 (1944)).

a particular rate falls within the zone of reasonableness involves a “balancing of the investor and the consumer interests.”¹⁷⁹ Rates are constitutional so long as they provide a return on equity that is sufficient to cover operating expenses, allow for returns that are “commensurate with returns on investments in other enterprises having corresponding risks,” and are “sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital.”¹⁸⁰ In so holding, the Court made clear that the mere fact that a particular rate reduced the value of the utility’s property is not by itself sufficient to render a rate confiscatory. As the Court acknowledged, “Rate-making is indeed but one species of price-fixing. The fixing of prices, like other applications of the police power, may reduce the value of the property which is being regulated. But the fact that the value is reduced does not mean that the regulation is invalid.”¹⁸¹

Some Justices have emphasized that the Court’s confiscatory rate-making jurisprudence occupied a sphere that was distinct and separate from its physical takings jurisprudence. For example, Justice Brandeis recognized that the Court’s decisions regarding the determination of value in condemnation cases played no part in determining value for rate-making purposes.¹⁸² Justice Black offered a similar observation in *Federal Power Commission v. Natural Gas Pipeline Co.*, stating that “[i]n condemnation cases, the ‘value of property, generally speaking, is determined by its productiveness—the profits which its use brings to the owner.’”¹⁸³ In addition, “when property is taken under the power of eminent domain the owner is ‘entitled to the full money equivalent of the property taken, and thereby to be put in as good position pecuniarily as it would have occupied if its property had not been taken.’”¹⁸⁴ Those principles, Black pointed out, “have no place in rate regulation.”¹⁸⁵ All rate regulation necessarily reduces the value

¹⁷⁹ *Hope Natural Gas*, 320 U.S. at 603; see *supra* note 70 and accompanying text.

¹⁸⁰ *Hope Natural Gas*, 320 U.S. at 603 (holding that rates are constitutional so long as they “enable the company to operate successfully, to maintain its financial integrity, to attract capital, and to compensate its investors for the risks assumed”); *accord Duquesne Light*, 488 U.S. at 312 (holding that rates are valid if they do not “jeopardize the financial integrity of the compan[y], either by leaving [it] insufficient operating capital or by impeding [its] ability to raise future capital” and if they are adequate “to compensate current equity holders for the risk associated with their investments”).

¹⁸¹ *Hope Natural Gas*, 320 U.S. at 601 (citation omitted); *accord* *Fed. Power Comm’n v. Natural Gas Pipeline Co.*, 315 U.S. 575, 603 (1942) (Black, J., concurring).

¹⁸² See *Missouri ex rel. Southwestern Bell Tel. Co. v. Pub. Serv. Comm’n*, 262 U.S. 276, 310–11 (1923) (Brandeis, J., concurring in the judgment).

¹⁸³ 315 U.S. at 603 (Black, J., concurring) (quoting *Monongahela Navigation Co. v. United States*, 148 U.S. 312, 328 (1893)).

¹⁸⁴ *Id.* (Black, J., concurring) (quoting *United States v. New River Collieries Co.*, 262 U.S. 341, 343 (1923)).

¹⁸⁵ *Id.* (Black, J., concurring).

of the regulated property, but this fact does not “stay the hand of the legislature or its administrative agency in making rate reductions.”¹⁸⁶

b. *Regulatory Takings*

Regulatory takings are the second type of nonpossessory taking recognized by the Supreme Court. As Justice Holmes acknowledged in his seminal opinion in *Pennsylvania Coal Co. v. Mahon*,¹⁸⁷ regulatory takings necessarily involve a difficult balance of interests. On the one hand, the government must have wide latitude in regulating the use of property, even if such regulation reduced the property’s value.¹⁸⁸ Indeed, “[g]overnment hardly could go on if to some extent values incidental to property could not be diminished without paying for every such change in the general law.”¹⁸⁹ On the other hand, the government’s ability to impose limits on the use of property “must have its limits” if the constitutional protection of property is to be meaningful.¹⁹⁰ Without some restriction on the government’s ability to qualify the manner in which owners can use their property, “the natural tendency of human nature [would be] to extend the qualification more and more until at last private property disappears.”¹⁹¹ Thus, “[t]he general rule at least is, that while property may be regulated to a certain extent, if regulation goes too far it will be recognized as a taking.”¹⁹² Although the Supreme Court’s regulatory takings jurisprudence originally emerged in the context of land-use restrictions, the Court has since applied the analysis to any government-imposed nonpossessory restriction on property.¹⁹³

In the landmark decision in *Lucas v. South Carolina Coastal Council*,¹⁹⁴ the Court squarely held what it had frequently noted in dicta in

¹⁸⁶ *Id.* (Black, J., concurring).

¹⁸⁷ 260 U.S. 393, 416 (1922). Although *Pennsylvania Coal* is generally regarded as the seminal opinion on regulatory takings, *see, e.g.*, *Lucas v. S.C. Coastal Council*, 505 U.S. 1003, 1014 (1992), it was not without its historical antecedents. *See, e.g.*, *Hadacheck v. Sebastian*, 239 U.S. 394, 410–11 (1915); *Commonwealth v. Perry*, 28 N.E. 1126, 1127 (Mass. 1891) (Holmes, J., dissenting).

¹⁸⁸ 260 U.S. at 413.

¹⁸⁹ *Id.*

¹⁹⁰ *Id.*

¹⁹¹ *Id.* at 415.

¹⁹² *Id.* For more recent restatements of this rationale, *see Tahoe-Sierra Preservation Council, Inc. v. Tahoe Regional Planning Agency*, 535 U.S. 302, 325 n.21 (2002), and *Lucas*, 505 U.S. at 1014.

¹⁹³ *See E. Enters. v. Apfel*, 524 U.S. 498, 522–37 (1998) (plurality opinion) (retiree benefits); *Phillips v. Wash. Legal Found.*, 524 U.S. 156, 172 (1998) (interest on attorney trust accounts); *Concrete Pipe & Prods. of Cal., Inc. v. Constr. Laborers Pension Trust*, 508 U.S. 602, 641–45 (1993) (pension plans); *Bowen v. Gilliard*, 483 U.S. 587, 603–09 (1987) (welfare payments); *Ruckelshaus v. Monsanto Co.*, 467 U.S. 986, 1004–19 (1984) (pesticide formulas); *United States v. Sec. Indus. Bank*, 459 U.S. 70, 78 (1982) (liens on real property); *Andrus v. Allard*, 444 U.S. 51, 64–68 (1979) (eagle feathers).

¹⁹⁴ 505 U.S. 1003 (1992).

other cases:¹⁹⁵ a nonpossessory regulation may constitute a per se taking if it deprives the owner of “all economically beneficial or productive use of land.”¹⁹⁶ When a restriction reaches this level, it can no longer be considered a regulation that “simply adjust[s] the benefits and burdens of economic life,” but instead is more properly regarded as “the equivalent of a physical appropriation.”¹⁹⁷

A more difficult issue arises when a restriction that falls short of eliminating all economically beneficial use nonetheless constitutes a regulatory taking. Holmes did not elaborate on the proper way to balance the interests of property owners and the government, although he did note that “this is a question of degree.”¹⁹⁸ The Court did not offer much additional guidance until 1978, when it issued its opinion in *Penn Central Transportation Co. v. City of New York*.¹⁹⁹ In *Penn Central*, the Court recognized that, although determining whether a particular governmental action constitutes a taking is an “essentially ad hoc, factual inquir[y],” it is possible to identify three factors with particular significance.²⁰⁰ Specifically, the Court focused on (1) “the economic impact of the regulation” on the property owner, (2) “the extent to which the regulation has interfered with distinct investment-backed expectations,” and (3) “the character of the governmental action.”²⁰¹ The Court immediately thereafter emphasized that “[a] ‘taking’ may more readily be found when the interference with property can be characterized as a physical invasion by government than when interference arises from some public program adjusting the benefits and burdens of economic life to promote the common good.”²⁰²

What is perhaps most striking about *Penn Central* is the suggestion that physical and regulatory takings might be governed by the same analysis. The Court’s observation that a taking may “more readily” be found when the regulation effects a physical invasion arguably implies that a physical invasion of property is not by itself a taking. Instead, it is simply one consideration that can be overcome by countervailing considerations. The Court seemed to confirm this conclusion in *PruneYard Shopping Center v. Robins*,²⁰³ in which the Court upheld a California decision requiring that the owner of a shopping center per-

¹⁹⁵ See *Nollan v. Cal. Coastal Comm’n*, 483 U.S. 825, 834 (1987); *Hodel v. Va. Surface Mining & Reclamation Ass’n*, 452 U.S. 264, 295–96 (1981); *Agins v. City of Tiburon*, 447 U.S. 255, 260 (1980).

¹⁹⁶ *Lucas*, 505 U.S. at 1015.

¹⁹⁷ *Id.* at 1017 (internal quotation marks omitted).

¹⁹⁸ *Pa. Coal Co. v. Mahon*, 260 U.S. 393, 416 (1922).

¹⁹⁹ 438 U.S. 104 (1978).

²⁰⁰ *Id.* at 124.

²⁰¹ *Id.*

²⁰² *Id.* (citation omitted).

²⁰³ 447 U.S. 74 (1980).

mit a group of high school students to engage in political speech on his premises. In holding that this requirement did not violate the Takings Clause, the Court stated that the students' physical invasion of the shopping center "cannot be viewed as determinative."²⁰⁴ Many noted scholars have downplayed the importance of this language and argued that *PruneYard* can be explained largely on First Amendment grounds.²⁰⁵ Nevertheless, a number of lower courts following *PruneYard* held that the *Penn Central* factors govern takings that effect physical invasions as well as nonpossessory restrictions on the use of property.²⁰⁶

The Supreme Court soon removed any remaining doubts about the issue. In the first of two leading cases on the proper takings analysis applied to compelled access to communications networks, the Court in *Loretto v. Teleprompter Manhattan CATV Corp.*²⁰⁷ firmly distinguished between its physical and regulatory takings jurisprudence.

2. *Loretto and the Distinction Between Physical and Regulatory Takings*

The issue in *Loretto* concerned cable operators' ability to string coaxial cables on New York apartment buildings for the provision of cable television services.²⁰⁸ Such cables served two distinct purposes. First, they allowed cable operators to provide service to each building's tenants. Second, even if no tenant in a particular building subscribed to cable, the cable operator often needed to string a "crossover" line in order to service customers in adjacent buildings.²⁰⁹ In 1970, the previous owner of the plaintiff's building allowed the local cable operator to install a thirty-five-foot crossover line that was less than one-half inch in diameter and which ran eighteen inches above the building's roof. The operator also attached directional taps, measuring four inches per side, on the front and rear of the roof and two silver boxes, measuring 18 by 12 by 6 inches, along the roof cables. When the building's tenants subscribed to the service, the cable operator installed another cable running down the front of the building to the first floor.²¹⁰

²⁰⁴ *Id.* at 84.

²⁰⁵ *See, e.g.*, LAURENCE H. TRIBE, AMERICAN CONSTITUTIONAL LAW § 9.5, at 600 (2d ed. 1988); *cf. Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 450–51 (1982) (Blackmun, J., dissenting) (suggesting that *Loretto* rejected the takings rationale of *PruneYard*).

²⁰⁶ *See, e.g.*, *Loretto v. Teleprompter Manhattan CATV Corp.*, 423 N.E.2d 320, 331–34 (N.Y. 1981), *rev'd*, 458 U.S. 419 (1982).

²⁰⁷ 458 U.S. 419 (1982).

²⁰⁸ *Id.* at 422.

²⁰⁹ *Id.*

²¹⁰ *Id.* at 422, 438 n.16.

The cable operator originally compensated building owners for such access by paying them a standard rate of five percent of the gross revenues realized from the particular property owned.²¹¹ In 1973, however, the State of New York enacted a statute requiring that landlords permit cable operators to install equipment on their property and providing that a state agency would set the rate of compensation.²¹² The agency eventually set the compensation at a one-time rate of one dollar.²¹³ The plaintiff, owner of a Manhattan apartment building, challenged the statute on the ground that it violated the Takings Clause.²¹⁴ The New York Court of Appeals, consistent with the suggestion of the language in *Penn Central* and *PruneYard* quoted above, held that a government-authorized physical occupation is not necessarily a taking.²¹⁵

The Supreme Court responded with a ringing reaffirmation of the distinction between physical and regulatory takings. In particular, the Court rejected the conclusion that the takings determination should in all cases be governed by the ad hoc standards announced in *Penn Central*.²¹⁶ Instead, the Court held that any regulation that authorizes a permanent physical occupation of property constitutes a per se taking. This proposition held regardless of whether the government itself occupied the property or simply empowered a third party to do so.²¹⁷

The Court based its decision on three considerations. First, the Court looked to precedent, finding that that “when the ‘character of the governmental action’ is a permanent physical occupation of property, our cases uniformly have found a taking to the extent of the occupation, without regard to whether the action achieves an important public benefit or has only minimal economic impact on the owner.”²¹⁸ Indeed, the Court indicated that it was the “historical” and “traditional” rule to treat a permanent physical occupation as a per se

²¹¹ *Id.* at 423.

²¹² *Id.*

²¹³ *Id.* at 423–24.

²¹⁴ *See id.* at 423–24.

²¹⁵ *Loretto v. Teleprompter Manhattan CATV Corp.*, 423 N.E.2d 320, 330–32 (N.Y. 1981), *rev'd*, 458 U.S. 419 (1982).

²¹⁶ *See Loretto*, 458 U.S. at 432.

²¹⁷ *See id.* at 432 n.9 (“A permanent physical occupation authorized by state law is a taking without regard to whether the State, or instead a party authorized by the State, is the occupant.”).

²¹⁸ *Id.* at 434–35 (quoting *Penn Cent. Transp. Co. v. City of New York*, 438 U.S. 104, 124 (1978) (citation omitted); *see also id.* at 427 (“When faced with a constitutional challenge to a permanent physical occupation of real property, this Court has invariably found a taking.”); *id.* at 427–34 (reviewing precedent)).

taking.²¹⁹ In so holding, the Court explicitly limited or rejected language in *Penn Central* and *PruneYard* that suggested otherwise.²²⁰

Second, the Court drew support for its conclusion from the general policies underlying the existence of property rights. Permanent appropriation of property is “perhaps the most serious form of invasion of an owner’s property interests.”²²¹ In so reasoning, the Court invoked the familiar metaphor of property as a bundle of rights encompassing three separate strands—the rights to possess, use, and dispose of the property.²²² Unlike regulatory takings, which affect only the property-use strand, physical invasions “chop[] through the bundle, taking a slice of every strand.”²²³ Specifically, physical occupations necessarily foreclose owners from either possessing or using the occupied portion of property.²²⁴ Although the owner retains the theoretical right to dispose of the occupied space, the presence of equipment attached to that space essentially “empt[ies] the right of any value.”²²⁵ In addition, the Court concluded that these deprivations are particularly severe when the government authorizes a stranger to invade and occupy the owner’s property.²²⁶ As a result, the Court concluded that a permanent physical occupation “is qualitatively more severe than a regulation of the *use* of property, even a regulation that imposes affirmative duties on the owner, since the owner may have no control over the timing, extent, or nature of the invasion.”²²⁷

²¹⁹ *Id.* at 435–36, 441.

²²⁰ *See id.* at 432, 441. The Court reasoned that nothing in *Penn Central* “repudiate[s] the rule that a permanent physical occupation is a government action of such a unique character that it is a taking without regard to other factors that a court might ordinarily examine.” *Id.* at 432. The Court emphasized that the “permanence and absolute exclusivity” of the physical occupation at issue in *Loretto* “distinguish[ed] it from [the] temporary limitations on the right to exclude” at issue in *PruneYard*. *Id.* at 435 n.12. The Court also distinguished *PruneYard* on the grounds that the invasion in that case was “temporary and limited in nature” and that “the owner had not exhibited an interest in excluding all persons from his property.” *Id.* at 434. Moreover, in *PruneYard*, “the owner had already opened his property to the general public, and . . . permanent access was not required.” *Nolan v. Ca. Coastal Comm’n*, 483 U.S. 825, 832 n.1 (1987). For a recent analysis of *PruneYard*, see Richard A. Epstein, *Takings, Exclusivity and Speech: The Legacy of PruneYard v. Robins*, 64 U. CHI. L. REV. 21, 33–50 (1997).

²²¹ *Loretto*, 458 U.S. at 435; *see id.* at 441 (concluding that a permanent physical occupation is “qualitatively more intrusive than perhaps any other category of property regulation”).

²²² *See id.* at 435.

²²³ *Id.*

²²⁴ *See id.* at 436. The Court emphasized that physical invasions also deny an owner the power to exclude others from his property, a power which “has traditionally been considered one of the most treasured strands in an owner’s bundle of property rights.” *Id.* at 435.

²²⁵ *Id.* at 436.

²²⁶ *Id.* The Court classified such a regulation as “literally add[ing] insult to injury” because it violates “an owner’s expectation that he will be relatively undisturbed at least in the possession of his property.” *Id.*

²²⁷ *Id.*

Finally, the Court invoked practical considerations. Treating permanent physical occupations as per se takings “avoids otherwise difficult line-drawing problems.”²²⁸ Unlike the ad hoc quality of the *Penn Central* balancing test, determining the presence of a permanent physical occupation under *Loretto* poses fewer problems of proof. For example, “[t]he placement of a fixed structure on land or real property is an obvious fact that will rarely be subject to dispute.”²²⁹ As a result, when the government action is in the form of a permanent physical occupation, that factor by itself becomes “determinative.”²³⁰ Although the size and economic impact of the occupation are relevant in ascertaining the amount of compensation,²³¹ those considerations play no role in determining whether a taking has occurred.²³²

The Court was careful to emphasize that its holding was not at odds with the “substantial authority” upholding the state power to restrict an owner’s use of his property.²³³ Citing *Penn Central*, the Court observed that “[s]o long as these regulations do not require the [property owner] to suffer the physical occupation of a portion of his building by a third party, they will be analyzed under the multifactor inquiry generally applicable to nonpossessory governmental activity.”²³⁴

Loretto thus established two principles that play a central role in our analysis. First, the opinion articulated a strong rationale for subjecting physical takings to the highest degree of protection under the Takings Clause. If a regulation requires a property owner to allow third parties to install permanent equipment on his property, it constitutes a per se taking, regardless of the size of the physical invasion or the public purposes that the regulation advances.²³⁵ Second, *Loretto*

²²⁸ *Id.*

²²⁹ *Id.* at 437; see also *Palazzolo v. Rhode Island*, 533 U.S. 606, 628 (2001) (noting that in those cases in which a physical taking is involved, “the fact and extent of the taking are known.”).

²³⁰ *Loretto*, 458 U.S. at 426.

²³¹ See *id.* at 437.

²³² See *id.* at 434–35, 436–38. Addressing the cable company’s argument regarding the small size of the equipment it installed, Justice Marshall quipped, “whether the installation is a taking does not depend on whether the volume of space it occupies is bigger than a breadbox.” *Id.* at 438 n.16.

²³³ See *id.* at 440, 441 (“[O]ur holding today in no way alters the analysis governing the State’s power to require landlords to comply with building codes and to provide utility connections, mailboxes, smoke detectors, fire extinguishers, and the like in the common area of a building.”).

²³⁴ *Id.* at 440 (citing *Penn Cent. Transp. Co. v. City of New York*, 438 U.S. 104 (1978)). The reference to *Penn Central* indicates that the Court was referring to traditional regulatory takings doctrine.

²³⁵ It bears emphasizing that this Article advances a far narrower argument than the one advanced in *SIDAK & SPULBER*, *supra* note 39, at 229–32, which claimed that *Loretto* required compensation for any deviation from investment-backed expectations resulting from a change in regulatory systems and that a third party’s introduction of a data stream

reasserted the sharp distinction between the Court's physical and regulatory takings jurisprudence. When a physical taking is involved, regulatory takings precedent does not apply.

3. *Florida Power and the Distinction Between Physical Takings and Confiscatory Rate-Making*

The Supreme Court advanced similar themes in *FCC v. Florida Power Corp.*,²³⁶ the other leading case involving a takings challenge to regulation compelling access to a communications network. As noted in *Loretto*, the distribution of cable television depended on the operator's ability to establish a web of coaxial cables connecting individual households.²³⁷ Although in urban areas this could be accomplished by compelling building owners to allow cable operators to string cable across their properties,²³⁸ in suburban and rural areas, the network of utility poles owned by telephone and electric companies was the only feasible means of establishing the necessary infrastructure.²³⁹ Congress was concerned, however, that utility companies were exploiting their monopoly position by overcharging cable operators for the right to attach coaxial cables to existing utility poles. As a result, in 1978 Congress enacted the Pole Attachments Act²⁴⁰ authorizing the FCC to regulate the terms and conditions of pole attachment agreements in any state that did not already impose such regulation.²⁴¹

Nothing in the original version of the Pole Attachments Act gave "cable companies any right to occupy space on utility poles, or prohibit[ed] utility companies from refusing to enter into attachment agreements with cable operators."²⁴² Instead, the Act simply regulated the rents charged by those parties who voluntarily chose to enter into such agreements. As a result the Court held that the Act did not constitute the type of permanent physical occupation that *Loretto* held to be a per se taking because it lacked the necessary "element of required acquiescence."²⁴³ The Court found *Loretto* dispositive, concluding that, "[s]o long as these regulations do not *require* the

constituted a physical occupation. Instead, this Article limits itself to what is indisputably *Loretto*'s core holding—that regulations authorizing the permanent placement of equipment on another person's property constitute a physical taking. See *supra* note 217 and accompanying text. Thus, even those who question the former interpretation of *Loretto* are unlikely to find this Article's interpretation controversial.

²³⁶ 480 U.S. 245 (1987).

²³⁷ See *supra* notes 208–09 and accompanying text.

²³⁸ *Supra* notes 208–09 and accompanying text.

²³⁹ See *Fla. Power*, 480 U.S. at 247.

²⁴⁰ Pub. L. No. 95-234, 92 Stat. 33 (codified as amended at 47 U.S.C. § 224 (2000)).

²⁴¹ See *Fla. Power*, 480 U.S. at 247–48. Cable companies did not utilize the underground rights of way owned by natural gas companies because "in most instances underground installation of the necessary cables is impossible or impracticable." *Id.* at 247.

²⁴² *Id.* at 251.

²⁴³ *Id.* at 252.

landlord to suffer the physical occupation of a portion of his building by a third party, they will be analyzed under the multifactor inquiry generally applicable to nonpossessory governmental activity.’”²⁴⁴

Having held that the Pole Attachments Act fell outside *Loretto*’s per se rule governing physical takings, the Court evaluated whether the Act nonetheless represented a nonpossessory taking. Rather than applying the *Penn Central* factors, as its quotation of *Loretto* suggested, *Florida Power* held that the Takings Clause simply required that the set rates not be confiscatory.²⁴⁵ The Court concluded that the pole attachment rates established by the statute allowed for sufficient return on investment to satisfy the requirements of its confiscatory rate-making jurisprudence.²⁴⁶

Florida Power thus reinforced the same key principles underlying the Court’s decision in *Loretto*. First, although it did not address the issue explicitly, the Court implied that had the Pole Attachments Act compelled utilities to give cable television systems access to their poles, the Act would have constituted a per se taking under *Loretto*.²⁴⁷ Second, *Florida Power* underscored the sharp distinction between the Court’s physical takings and confiscatory ratemaking precedent. Echoing the admonitions of Justices Brandeis and Black that physical takings and confiscatory ratemaking occupy distinct jurisprudential spheres,²⁴⁸ the Court established that its confiscatory rate-making precedent did not apply to cases involving physical takings.²⁴⁹

4. *Implications*

a. *Towards a Possible Synthesis of Regulatory Takings and Confiscatory Rate-Making Doctrine*

Although courts and scholars typically treat regulatory takings and confiscatory rate-making as conceptually distinct,²⁵⁰ the Court’s opinions in *Loretto* and *Florida Power* suggest that both lines of precedent may represent a single concept. It is easy to conceptualize a re-

²⁴⁴ *Id.* (quoting *Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 440 (1982)). The Court further noted:

Appellees contend, in essence, that it is a taking under *Loretto* for a tenant invited to lease at a rent of \$7.15 to remain at the regulated rent of \$1.79. But it is the invitation, not the rent, that makes the difference. The line which separates these cases from *Loretto* is the unambiguous distinction between a commercial lessee and an interloper with a government license.

Id. at 252–53.

²⁴⁵ *See id.* at 253 (citing *Permian Basin Area Rate Cases*, 390 U.S. 747, 770 (1968); *St. Joseph Stock Yards Co. v. United States*, 298 U.S. 38, 53 (1936)).

²⁴⁶ *See id.* at 253–54.

²⁴⁷ *See id.* at 251–52 n.6.

²⁴⁸ *See supra* notes 182–86 and accompanying text.

²⁴⁹ *See Fla. Power*, 480 U.S. at 251–52.

²⁵⁰ *See, e.g., SIDA & SPULBER, supra* note 39, at 213.

striction on the amount that one can charge for access to a piece of property as either a restriction on the property's use or as a "public program adjusting the benefits and burdens of economic life to promote the common good."²⁵¹ Moreover, similar concerns appear to animate both lines of precedent. Each recognizes that almost every government action necessarily affects the value of private property and that imposing too stringent a leash on regulatory action conflicts with the exigencies of modern governance.²⁵² At the same time, both recognize that excess power to regulate can constitute the power to destroy.²⁵³ In addition, both employ almost identical methodologies that emphasize the fact-specific nature of the claims²⁵⁴ and that focus primarily on the restriction's economic impact on the regulated entity²⁵⁵ and investor expectations.²⁵⁶

Finally, some case law suggests that these two approaches may be fungible. For example, in *Florida Power* the Court invoked its regulatory takings jurisprudence when it suggested that unless a regulation required that utilities permit cable companies to occupy existing poles permanently, it would be "analyzed under the multifactor inquiry generally applicable to nonpossessory governmental activity."²⁵⁷ Immediately following that observation, however, the Court held that in the absence of such compulsion, the Pole Attachments Act was prop-

²⁵¹ See *Penn Cent. Transp. Co. v. City of New York*, 438 U.S. 104, 124 (1978).

²⁵² Compare, e.g., *Pa. Coal Co. v. Mahon*, 260 U.S. 393, 413 (1922) ("Government hardly could go on if to some extent values incident to property could not be diminished without paying for every such change in the general law."), with *Fed. Power Comm'n v. Hope Natural Gas Co.*, 320 U.S. 591, 601 (1944) ("The fixing of prices . . . may reduce the value of the property which is being regulated. But the fact that the value is reduced does not mean that the regulation is invalid.").

²⁵³ Compare *Pa. Coal*, 260 U.S. at 415 (noting that, without some limit on the government's ability to restrict owners' use of their property, "the natural tendency of human nature [would be] to extend the qualification more and more until at last private property disappears"), with *R.R. Comm'n Cases*, 116 U.S. 307, 331 (1886) ("[I]t is not to be inferred that this power of limitation or regulation [of rates] is itself without limit. This power to regulate is not a power to destroy, and limitation is not the equivalent of confiscation.").

²⁵⁴ Compare *Penn Cent.*, 438 U.S. at 124 (calling the regulatory takings standard an "essentially ad hoc, factual inquir[y]"), with *Hope Natural Gas*, 320 U.S. at 602 (observing that determining whether a rate is confiscatory depends upon a series of fact-intensive inquiries focusing on the rate's net effect).

²⁵⁵ Compare *Penn Cent.*, 438 U.S. at 124 (identifying "[t]he economic impact of the regulation on the claimant" as a factor in the regulatory takings analysis), with *Hope Natural Gas*, 320 U.S. at 603 (recognizing the importance of ensuring that the regulated entity receives "enough revenue not only for operating expenses but also for the capital costs of the business").

²⁵⁶ Compare *Penn Cent.*, 438 U.S. at 124 (identifying "the extent to which the regulation has interfered with distinct investment-backed expectations" as a factor in the regulatory takings analysis), with *Hope Natural Gas*, 320 U.S. at 603 (noting that investors have "a legitimate concern with the financial integrity of the company whose rates are being regulated").

²⁵⁷ *FCC v. Fla. Power Corp.*, 480 U.S. 245, 252 (1987) (quoting *Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 440 (1982)).

erly analyzed under the Court's confiscatory rate-making precedent.²⁵⁸ The juxtaposition of these two observations indicates that the Court may have viewed these two lines of precedent as simply variations on the same theme.

The Court's reasoning in rent control cases gives rise to a similar inference. For example, the Court analyzed the rent control ordinance at issue in *Pennell v. City of San Jose*²⁵⁹ in terms of the Court's confiscatory rate-making precedent. In contrast, the Court analyzed the rent control ordinance in *Yee v. City of Escondido*²⁶⁰ in terms of its regulatory takings jurisprudence, stating that the rent control ordinance at issue "merely regulate[s] petitioners' use of their land by regulating the relationship between landlord and tenant."²⁶¹ Indeed, the Court specifically equated rent ceilings imposed on landlords with other use restrictions and declared that both types of restrictions were properly analyzed under classic regulatory takings precedent such as *Pennsylvania Coal* and *Penn Central's* progeny.²⁶² The parallel between the two doctrines is further underscored by the Court's opinion in *Lucas v. South Carolina Coastal Council*, which described the strand of regulatory takings doctrine used to invalidate regulations prohibiting all economically beneficial land use as being directed against "confiscatory" regulations.²⁶³

It is thus arguable that the Court's regulatory takings and confiscatory rate-making jurisprudence amount to slightly different aspects of a single doctrine. Unfortunately, the Court has never clearly addressed the relationship between these two lines of precedent, and scholarly analysis has shed little light on the issue.²⁶⁴ In addition, it would be anachronistic to suggest that the Court had a unified takings jurisprudence in mind from the outset. The Court's confiscatory takings jurisprudence long antedates its recognition of regulatory takings in *Pennsylvania Coal*, let alone its announcement of ad hoc factors in *Penn Central*. In fact, because states primarily regulated rates and the Takings Clause was not applied to the states until 1897,²⁶⁵ the earliest

²⁵⁸ See *id.* at 253–54.

²⁵⁹ 485 U.S. 1, 11–13 (1988).

²⁶⁰ 503 U.S. 519, 522–23 (1992).

²⁶¹ *Id.* at 528; see also *Block v. Hirsh*, 256 U.S. 135, 155–56 (1921) (Holmes, J.) (analogizing rent control to restrictions on the use of property, such as limits on billboards and building heights).

²⁶² See *Yee*, 503 U.S. at 529.

²⁶³ 505 U.S. 1003, 1029, 1032 n.18 (1992).

²⁶⁴ See John N. Drobak, *From Turnpike to Nuclear Power: The Constitutional Limits on Utility Rate Regulation*, 65 B.U. L. REV. 65, 98 (1985) (asserting, without analysis, that the Court's regulatory takings and confiscatory rate-making precedents are equivalent); see also Richard Goldsmith, *Utility Rates and "Takings"*, 10 ENERGY L.J. 241, 256–62 (1989) (identifying similarities in the Court's regulatory takings and confiscatory rate-making precedents, but concluding that confiscatory rate-making is based on due process considerations).

²⁶⁵ See *Chi., Burlington & Quincy R.R. Co. v. Chicago*, 166 U.S. 226, 241 (1897).

confiscatory rate-making cases arose under the Due Process Clause, rather than the Takings Clause. The historical dichotomy is further reinforced by the views of Justice Brewer, perhaps the primary architect of the Court's early takings jurisprudence. His famous speech at Yale Law School on the subject clearly evinced his belief that rate regulation and use restrictions represent distinct lines of authority.²⁶⁶

b. *The Paradigmatic Importance of the Shift to Access Regulation*

Fortunately, we need not resolve the precise relationship between regulatory takings and confiscatory rate-making in order to press our argument. Although the cases do not shed much light on whether regulatory takings and confiscatory rate-making represent distinct concepts or slightly different aspects of the same doctrine, for our purposes it is sufficient that the Court has emphasized the importance of distinguishing both categories from its physical takings jurisprudence.²⁶⁷ If a regulation authorizes a third party to establish a permanent physical invasion, *Loretto* and *Florida Power* hold that it constitutes a per se taking—regardless of any other factors typically invoked in regulatory takings and confiscatory rate-making cases.

Equally important, the Court has frequently reiterated that its physical and nonpossessory takings cases occupy separate doctrinal spheres, and that its decisions involving nonpossessory takings have no application to physical takings. For example, the Court held in *Yee* that a regulatory takings challenge was not fairly included in a physical takings challenge, because “[c]onsideration of whether a regulatory taking occurred would not assist in resolving whether a physical taking occurred as well.”²⁶⁸ In so holding, the Court emphasized that both questions “exist side by side, neither encompassing the other.”²⁶⁹ The Court struck a similar note in *Palazzolo v. Rhode Island*²⁷⁰ when it recognized that physical takings “present[] different considerations than cases alleging a taking based on a burdensome regulation.”²⁷¹

The Court reaffirmed these principles in *Tahoe-Sierra Preservation Council, Inc. v. Tahoe Regional Planning Agency*.²⁷² The Court held that whenever a physical taking occurs, the government has a categorical duty to compensate the owner, regardless of the size of the occupa-

²⁶⁶ See D.J. Brewer, *Protection to Private Property from Public Attack*, 55 NEW ENGLANDER & YALE REV. 97, 101–04 (1891), reprinted in 2 PROPERTY RIGHTS IN AMERICAN HISTORY 41, 45–48 (James W. Ely, Jr. ed., 1997).

²⁶⁷ See *supra* notes 235–36, 248–49 and accompanying text.

²⁶⁸ *Yee v. City of Escondido*, 503 U.S. 519, 537 (1992).

²⁶⁹ *Id.*

²⁷⁰ 533 U.S. 606 (2001).

²⁷¹ *Id.* at 628.

²⁷² 535 U.S. 302 (2002).

tion or whether the government only takes part of a larger parcel.²⁷³ Echoing its more extended discussion in *Loretto*, the Court found it appropriate to treat physical takings categorically because “physical appropriations are relatively rare, easily identified, and usually represent a greater affront to individual property rights.”²⁷⁴ As a result, when determining whether a physical taking has occurred, the Court does not evaluate the magnitude of the economic impact on the property owner or inquire into the substantiality of the governmental interest underlying the regulation; any physical invasion, no matter how small, is sufficient to trigger the duty to compensate.²⁷⁵ Most importantly for our purposes, the *Tahoe-Sierra* Court emphasized that these differences “make[] it inappropriate to treat cases involving physical takings as controlling precedents for the evaluation of a claim that there has been a regulatory taking, and vice versa.”²⁷⁶ *Tahoe-Sierra* thus reaffirmed the core substantive holding of *Loretto* by reiterating that permanent physical occupations constitute per se takings without regard to the economic impact or the public purpose served by the invasion. *Tahoe-Sierra* also offered the Court’s plainest statement to date that its regulatory takings decisions do not constitute precedent in cases involving physical takings.

B. Physical Takings Jurisprudence Applied to Network Access

Determining whether a takings violation has occurred thus requires resolution of two separate questions. First, has the government action in question effected a taking? As the foregoing discussion underscores, the resolution of this question varies depending on whether the regulation at issue is alleged to be a physical taking. Second, has the government provided just compensation for its actions?

1. *Determining Whether a Taking Has Occurred*

In contrast to the analysis applied to both regulatory takings and confiscatory rate-making, which attempt to balance the interests of the public with those of the utility and which carefully examine the regulation’s economic impact, physical takings are governed by a simple bright-line rule. As the Court held in *Loretto* and reaffirmed several times since, government action is a per se taking if it authorizes a permanent physical occupation, such as giving third parties the right to place telecommunications equipment on another person’s property.²⁷⁷ This fact underscores the constitutional significance of the

²⁷³ *Id.* at 320–22.

²⁷⁴ *Id.* at 324.

²⁷⁵ *Id.* at 322.

²⁷⁶ *Id.* at 323 (footnote and internal quotation marks omitted).

²⁷⁷ *See supra* Part II.A.2.

shift from rate regulation to access regulation. If a permanent physical occupation occurs, it does not matter whether the action furthers an important public interest or achieves an important public benefit.²⁷⁸ Nor does the size or economic impact of the invasion matter.²⁷⁹ Indeed, a permanent physical invasion constitutes a per se taking even if it increases the value of the property.²⁸⁰ The Court reasoned:

[This] conclusion . . . [is] premised on our longstanding recognition that property is more than economic value; it also consists of “the group of rights which the so-called owner exercises in his dominion of the physical thing,” such “as the right to possess, use and dispose of it.” While the [property] at issue here may have no economically realizable value to its owner, possession, control, and disposition are nonetheless valuable rights that inhere in the property.²⁸¹

As will be discussed below in greater detail,²⁸² regulations that compel access to wireline telecommunications networks also generally require the placement of third-party equipment on the network owner’s property.²⁸³ As a result, the shift from rate regulation to access regulation generates an equally fundamental shift in the constitu-

²⁷⁸ See *Tahoe-Sierra*, 535 U.S. at 322; *Lucas v. S.C. Coastal Council*, 505 U.S. 1003, 1015, 1028 (1992); *Yee v. City of Escondido*, 503 U.S. 519, 530 (1992); *Nollan v. Cal. Coastal Comm’n*, 483 U.S. 825, 831–32 (1987); *Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 426 (1982).

²⁷⁹ See *Tahoe-Sierra*, 535 U.S. at 322; *Lucas*, 505 U.S. at 1015; *Nollan*, 483 U.S. at 831–32; *Loretto*, 458 U.S. at 436–37, 438 n.16.

²⁸⁰ See *Phillips v. Wash. Legal Found.*, 524 U.S. 156, 169–70 (1998); *Loretto*, 458 U.S. at 437–38 n.15.

²⁸¹ *Phillips*, 524 U.S. at 170 (citations omitted) (quoting *United States v. Gen. Motors Corp.*, 323 U.S. 373, 378 (1945)).

²⁸² See *infra* notes 460–74, 579–91, 715–29 and accompanying text.

²⁸³ A more difficult question arises with regard to regulations that do not require a network owner to allow others to place equipment on its property, but instead require the network owner to extend its network onto another’s property so that this party may interconnect with the network. As will be discussed later, courts generally regard such requirements as physical takings, even though they involve no physical invasion of the network owner’s property. See *infra* notes 622–28 and accompanying text.

An even more difficult problem emerges with regard to regulations compelling access to a wireless network. In contrast to wireline communications, which depend on a physical connection to the network, wireless networks do not necessarily require the network owner to install third-party equipment on its property. As a result, the D.C. Circuit recently rejected a takings challenge to an FCC order intended to ensure access to different forms of television service. See *Bldg. Owners & Managers Ass’n Int’l v. FCC*, 254 F.3d 89, 99 (D.C. Cir. 2001). The order required property owners to allow residents to install antennas needed to receive DBS service, broadcast signals, and other forms of television programming. See *id.* at 91. The court concluded that, because the regulation did not compel a physical invasion of property by a third party, it did not constitute a per se taking under *Loretto*. See *id.* at 99.

It appears, then, that the constitutional arguments for basing access rates on market prices is weaker with respect to wireless networks than with respect to wireline networks. The economic arguments, however, are the same in each case, as the harm effected by the third party’s occupation of productive capacity is the same. As a result, we would still urge

tional analysis. Finding that a taking has occurred, however, is only the first step in the constitutional inquiry.

2. *Determining Just Compensation*

Once a court determines that a taking has occurred, the constitutionality of the regulation in question depends on whether the government provides just compensation for the property taken. The *Loretto* Court did not address the question of compensation, remanding it for consideration by the state courts.²⁸⁴ In addition, most courts confronted with this issue held that it was not ripe for judicial consideration.²⁸⁵

a. *Market Value as the Preferred Measure of Just Compensation*

The Court often has averred that the guiding principle for determining just compensation is that the owner should be put “‘in as good a position pecuniarily as if his property had not been taken.’”²⁸⁶ As a result, the Court established that the predominant measure of just compensation should be “market value.”²⁸⁷ As Justice Frankfurter reasoned in *Kimball Laundry Co. v. United States*:²⁸⁸

Most things . . . have a general demand which gives them a value transferable from one owner to another. As opposed to such per-

the FCC and state public utility commissions to base access rates on market prices as a matter of policy.

²⁸⁴ *Loretto*, 458 U.S. at 441.

²⁸⁵ See, e.g., *Verizon Communications, Inc. v. FCC*, 535 U.S. 467, 524–25 (2002); *Gulf Power Co. v. FCC*, 208 F.3d 1263, 1272–73 (11th Cir. 2000), *rev'd on other grounds sub nom. Nat'l Cable & Telecomms. Ass'n v. Gulf Power Co.*, 524 U.S. 327, 342 (2002); *Gulf Power Co. v. United States*, 187 F.3d 1324, 1338 (11th Cir. 1999); *Iowa Utils. Bd. v. FCC*, 120 F.3d 753, 818 (8th Cir. 1997), *rev'd & remanded in part on other grounds sub nom. AT&T Corp. v. Iowa Utils. Bd.*, 525 U.S. 366, 396 (1999); *Ill. Bell Tel. Co. v. FCC*, 911 F.2d 776, 780 (D.C. Cir. 1990).

²⁸⁶ *United States v. 564.54 Acres of Land*, 441 U.S. 506, 510 (1979) (“*Lutheran Synod*”) (quoting *Olson v. United States*, 292 U.S. 246, 255 (1934)). As Richard Epstein has noted, “In principle, the ideal solution is to leave the individual owner in a position of indifference between the taking by the government and the retention of the property.” RICHARD A. EPSTEIN, *TAKINGS: PRIVATE PROPERTY AND THE POWER OF EMINENT DOMAIN* 182, (1985). For the earliest statements of this principle, see *Monongahela Navigation Co. v. United States*, 148 U.S. 312, 326 (1893), and *Seaboard Air Line Railway Co. v. United States*, 261 U.S. 299, 304 (1923).

²⁸⁷ See, e.g., *United States v. 50 Acres of Land*, 469 U.S. 24, 29 (1984) (“*Duncanville Landfill*”); *Kirby Forest Indus. v. United States*, 467 U.S. 1, 10 (1984); *Lutheran Synod*, 441 U.S. at 511; *Almota Farmers Elevator & Warehouse Co. v. United States*, 409 U.S. 470, 474 (1973); *United States v. Commodities Trading Corp.*, 339 U.S. 121, 123 (1950); *United States v. Toronto, Hamilton & Buffalo Nav. Co.*, 338 U.S. 396, 402 (1949); *United States v. Gen. Motors Corp.*, 323 U.S. 373, 379 (1945); *United States v. Miller*, 317 U.S. 369, 374 (1943); *Olson*, 292 U.S. at 255; *United States v. New River Collieries Co.*, 262 U.S. 341, 344 (1923). Although the cases at times refer to this standard as “fair market value,” as the Court noted in *Miller*, the two formulations essentially amount to the same thing. 317 U.S. at 374.

²⁸⁸ 338 U.S. 1 (1949).

sonal and variant standards as value to the particular owner whose property has been taken, this transferable value has an external validity which makes it a fair measure of [just compensation].²⁸⁹

The external validity identified by Justice Frankfurter has both a theoretical and a practical basis. As a theoretical matter, market value reflects the seminal economic insights that effectively transformed *value* from the intrinsic concept of a good to the result of market transactions between buyers and sellers. A good's market value provides observable evidence—a market price—of the benefits to buyers and the costs to sellers. Market value thus sheds light on property rights by considering the returns in transferring those rights. In evaluating the value of assets used in production, market value provides tangible evidence of the property's earning potential. This shift was evident in *Monongahela Navigation Co. v. United States*,²⁹⁰ the first case in which the Court addressed just compensation principles. The Court determined that the Takings Clause required not only compensation for the tangible property taken—a lock and a dam—but also for the tolls the facility would have earned by using that property. The Takings Clause required payment of “a full and perfect equivalent for the property taken,”²⁹¹ which, “generally speaking, is determined by its productiveness,—the profits which its use brings to the owner.”²⁹² “The value, therefore, is not determined by the mere cost of construction, but more by what the completed structure brings in the way of earnings to its owner.”²⁹³ As a result, the income that the lock and the dam would have earned was considered part of the property's value.²⁹⁴ The Court subsequently reaffirmed this principle on numerous occasions.²⁹⁵

Practical considerations provide additional reasons for preferring exchange-oriented approaches over cost-oriented approaches when determining just compensation. As the Court observed, the shift to the market-value standard was driven in part by the “need for a clear, easily administrable rule governing the measure of ‘just compensation.’”²⁹⁶ The use of external measures of value eliminated many of the “serious practical difficulties in assessing the worth an individual

²⁸⁹ *Id.* at 5.

²⁹⁰ 148 U.S. 312.

²⁹¹ *Id.* at 326.

²⁹² *Id.* at 328.

²⁹³ *Id.*

²⁹⁴ *See id.* at 329.

²⁹⁵ *See, e.g., Lucas v. S.C. Coastal Council*, 505 U.S. 1003, 1017 (1992) (“For what is the land but the profits thereof?” (quoting 1 E. COKE, INSTITUTES, ch. 1, § 1 (1st Am. ed. 1812) (alterations omitted))); *Kimball Laundry Co. v. United States*, 338 U.S. 1, 9 (1949) (“The market value of land as a business site tends to be as high as the reasonably probable earnings of a business there situated would justify . . .”).

²⁹⁶ *Kirby Forest Indus. v. United States*, 467 U.S. 1, 10 n.15 (1984).

places on particular property at a given time.”²⁹⁷ Permitting such subjective considerations to determine what constitutes just compensation “would enhance the risk of error and prejudice.”²⁹⁸

The Court has held that the market-value standard is not constitutionally mandated and thus might not require strict adherence.²⁹⁹ Indeed, the Court has long recognized that market value fails to give “full and literal force” to the principle of putting property owners in as good a position as if their property had not been taken.³⁰⁰ In particular, the Court has frequently observed that just compensation does not necessarily require compensation for the special value that a piece of property may have for a particular user.³⁰¹ Furthermore, the Court does not allow recovery of any transaction costs imposed by the taking.³⁰² As a result, the market-value standard has been criticized for failing to make whole those whose property is taken.³⁰³

The Court has nonetheless concluded that the market-value standard offers an appropriate accommodation for the exigencies of modern governance. In most cases market value “achieves a fair ‘balance between the public’s need and the claimant’s loss,’ ”³⁰⁴ thereby mediating “the conflict between the people’s interest in public projects and the principle of indemnity to the landowner.”³⁰⁵ Although a failure to consider subjective valuation can impose real costs on those whose property is taken, this loss is “properly treated as part of the burden of

²⁹⁷ *United States v. 564.54 Acres of Land*, 441 U.S. 506, 511 (1979) (“*Lutheran Synod*”); *accord United States ex rel. Tenn. Valley Auth. v. Powelson*, 319 U.S. 266, 280 (1943).

²⁹⁸ *United States v. 50 Acres of Land*, 469 U.S. 24, 36 (1984).

²⁹⁹ *See id.* at 30–31; *Kirby Forest*, 467 U.S. at 10 n.14; *Lutheran Synod*, 441 U.S. at 512; *United States v. Fuller*, 409 U.S. 488, 490 (1973); *United States v. Toronto, Hamilton & Buffalo Nav. Co.*, 338 U.S. 396, 402 (1949); *United States v. Cors*, 337 U.S. 325, 332 (1949) (cautioning against making a “fetish” of market value).

³⁰⁰ *Lutheran Synod*, 441 U.S. at 511. The Court also held that “[a]lthough the market value standard is a useful and generally sufficient tool for ascertaining the compensation required to make the owner whole . . . [it] does not necessarily compensate for all values an owner may derive from his property.” *Id.*

³⁰¹ *See id.* (citing *United States v. Miller*, 317 U.S. 369, 374–75 (1943); *Cors*, 337 U.S. at 332).

³⁰² *See, e.g., United States v. Petty Motor Co.*, 327 U.S. 372, 377–78 (1946).

³⁰³ *See, e.g., James Geoffrey Durham, Efficient Just Compensation as a Limit on Eminent Domain*, 69 MINN. L. REV. 1277, 1300 (1985); *cf. supra* Part I.C.2 (arguing that transaction costs are real costs that should be taken into account when compensating network owners for access to their inputs). *See generally* DeBow, *supra* note 36, at 579–80 & n.7 (noting the systematic undercompensation of property, and collecting commentary); D. Michael Risinger, *Direct Damages: The Lost Key to Constitutional Just Compensation when Business Premises Are Condemned*, 15 SETON HALL L. REV. 483, 526–40 (1985) (collecting commentary).

³⁰⁴ *United States v. 50 Acres of Land*, 469 U.S. 24, 33 (1984) (“*Duncanville Landfill*”) (quoting *Toronto, Hamilton & Buffalo*, 338 U.S. at 402).

³⁰⁵ *United States ex rel. Tenn. Valley Auth. v. Powelson*, 319 U.S. 266, 280 (1943).

common citizenship.”³⁰⁶ As a result, any exceptions to the market-value rule remain very narrow.³⁰⁷

b. *Determining Market Value Under the Takings Clause*

Market value is the amount that would be paid for the property in a transaction between a willing buyer and a willing seller.³⁰⁸ Consequently, market value takes into account any aspect of the property that affects the price that a reasonable buyer is willing to pay.³⁰⁹ For example, in *Boom Co. v. Patterson*, the Court held that in determining the value of condemned land,

the same considerations are to be regarded as in a sale of property between private parties. The inquiry in such cases must be what is the property worth in the market, viewed not merely with reference to the uses to which it is at the time applied, but with reference to the uses to which it is plainly adapted³¹⁰

The Court reiterated these principles in *Olson v. United States*.³¹¹ In *Olson*, the Court noted that when determining the price upon which a willing buyer and a willing seller would settle, “there should be taken into account all considerations that fairly might be brought forward and reasonably be given substantial weight in such bargaining.”³¹² The Court acknowledged the importance of opportunity cost by stating that

[t]he highest and most profitable use for which the property is adaptable and needed or likely to be needed in the reasonably near future is to be considered, not necessarily as the measure of value, but to the full extent that the prospect of demand for such use affects the market value while the property is privately held.³¹³

In addition, “to the extent that probable demand by prospective purchasers or condemnors affects market value, it is to be taken into account.”³¹⁴

³⁰⁶ *Kimball Laundry Co. v. United States*, 338 U.S. 1, 5 (1949).

³⁰⁷ See DeBow, *supra* note 36, at 581; Lunney, *supra* note 36, at 729–31, 759–61; Ann E. Gergen, Note, *Why Fair Market Value Fails as Just Compensation*, 14 *HAMLIN J. PUB. L. & POL’Y* 181, 195 (1993).

³⁰⁸ See *Kirby Forest Indus. v. United States*, 467 U.S. 1, 10 (1984); *United States v. 564.54 Acres of Land*, 441 U.S. 506, 511 (1979) (“*Lutheran Synod*”); *United States v. Miller*, 317 U.S. 369, 374 (1943).

³⁰⁹ See *Almota Farmers Elevator & Warehouse Co. v. United States*, 409 U.S. 470, 474 (1973); *Olson v. United States*, 292 U.S. 246, 257–58 (1934); *Boom Co. v. Patterson*, 98 U.S. 403, 407–08 (1878).

³¹⁰ 98 U.S. at 407–08.

³¹¹ 292 U.S. 246 (1934).

³¹² *Id.* at 257; see *id.* at 255 (“Just compensation includes all elements of value that inhere in the property . . .”).

³¹³ *Id.* at 255.

³¹⁴ *Id.* at 256; accord *Almota*, 409 U.S. at 477–78 (valuing property based on every consideration that would have applied had the property been sold in an open market); *id.* at

Consistent with the economic principles identified above,³¹⁵ the Court has held that an evaluation of comparable sales represents the most reliable way to determine the amount a willing buyer would have agreed to pay a willing seller had the property been transferred on the open market. As the Court observed in *Kimball Laundry*, “If exchanges of similar property have been frequent, the inference is strong that the equivalent arrived at by the haggling of the market would probably have been offered and accepted, and it is thus that the ‘market price’ becomes so important a standard of reference.”³¹⁶

Other evaluation methodology may be required when the property being valued is traded so infrequently that, in effect, no market for it exists.³¹⁷ In the absence of comparable sales, when valuing commercial property the Court has sanctioned the income capitalization approach, in which market value is equal to the net present value of the property’s projected income.³¹⁸ Although this approach has the advantage of being based on data derived from actual market transactions, the Court has recognized that it does carry some risks. Estimates of value based on income capitalization are only as reliable as the data upon which they are based. For example, projections of future income are typically based upon a particular property’s past earnings. Although such data are often reliable indicators of future earnings, at times they may fail to reflect the full range of technological and economic developments.³¹⁹

In addition, the Court has suggested that in the absence of better measures of value, courts can appropriately consider replacement cost when determining whether the government has provided just compensation.³²⁰ As noted earlier, replacement cost is better than historic cost at reflecting changes in value over time.³²¹ Replacement cost also

479 (Powell, J., concurring) (giving weight to every value that would have applied in a transaction between a willing buyer and a willing seller).

³¹⁵ See *supra* Part I.C.1.

³¹⁶ *Kimball Laundry Co. v. United States*, 338 U.S. 1, 6 (1949).

³¹⁷ See, e.g., *United States v. 50 Acres of Land*, 469 U.S. 24, 29 (1984) (“*Duncanville Landfill*”); *Kirby Forest Indus. v. United States*, 467 U.S. 1, 10 n.14 (1984); *United States v. 564.54 Acres of Land*, 441 U.S. 506, 512 (1979) (“*Lutheran Synod*”); *United States v. Commodities Trading Corp.*, 339 U.S. 121, 123 (1950); *Kimball Laundry*, 338 U.S. at 5; *United States v. Toronto, Hamilton & Buffalo Nav. Co.*, 338 U.S. 396, 402 (1948); *United States v. Miller*, 317 U.S. 369, 374 (1943).

³¹⁸ See *Lutheran Synod*, 441 U.S. at 515 (noting that “the uses to which commercial property is put can often be valued in terms of the capitalized earnings produced”); *Kimball Laundry*, 338 U.S. at 16 (“One index of going-concern value offered by petitioner is the record of its past earnings.”). For an application of these principles in the telecommunications context, see *Illinois Bell Telephone Co. v. FCC*, 988 F.2d 1254, 1262–63 (D.C. Cir. 1993).

³¹⁹ See, e.g., *Toronto, Hamilton & Buffalo*, 338 U.S. at 398–403 (finding that development of new ferry routes rendered earnings records of prior years’ routes unreliable indicators of future income).

³²⁰ See *Kimball Laundry*, 338 U.S. at 5–7.

³²¹ See *supra* notes 39–40 and accompanying text.

provides a useful price ceiling, because all those who purchase access can create the input themselves.³²² At the same time, the Court's takings decisions recognize that replacement-cost approaches to valuation suffer from several conceptual limitations. First and foremost, such approaches do not necessarily reflect exchange value.³²³ In addition, by failing to incorporate any element that reflects demand, the replacement-cost approach may fail to account for technological obsolescence and thus may require compensation even "when no one would think of reproducing the property."³²⁴ Moreover, in order to compensate for functional obsolescence, courts must analyze the replacement cost of an equally efficient plant by allowing for physical depreciation. Failing to do so would bestow a windfall on the property owner due to the difference in quality between the replacement facility and the older facility.³²⁵ Factoring in depreciation does, however, add considerable uncertainty to the valuation process.³²⁶

The Court reserved its heaviest criticism for historical cost, the valuation approach upon which authorities have relied most often when regulating network industries.³²⁷ As the Court explained in *United States v. Toronto, Hamilton & Buffalo Navigation Co.*,³²⁸ historical cost all too often represents a "false standard of the past" that bears no necessary relationship with present value.³²⁹ As a result, historical cost is often a backward-looking measure that is unreliable in determining a current fair market value.³³⁰ Moreover, the Court in *Olson* pointed out that market value

may be more or less than the owner's investment. He may have acquired the property for less than its worth or he may have paid a speculative and exorbitant price. Its value may have changed substantially while held by him. . . . The public may not by any means confiscate the benefits, or be required to bear the burden, of the

³²² See *supra* Part I.C.2.

³²³ See 4 JULIUS L. SACKMAN, NICHOLS' THE LAW OF EMINENT DOMAIN § 12.01[1], at 12-35 to -37 (3d ed. 1995).

³²⁴ *Toronto, Hamilton & Buffalo*, 338 U.S. at 403. For example, in *Toronto, Hamilton & Buffalo*, the Court determined that replacement cost was misleading because the development of rail lines and larger ferries had rendered ships of the type in question obsolete. See *id.* at 399-400.

³²⁵ *United States v. 50 Acres of Land*, 469 U.S. 24, 34-35 (1984) ("*Duncanville Landfill*").

³²⁶ See *id.*

³²⁷ The Court's criticism of historical-cost methodologies dates back to its earliest takings decisions. See, e.g., *Monongahela Navigation Co. v. United States*, 148 U.S. 312, 328 (1893) ("The value, therefore, is not determined by the mere cost of construction. . . .").

³²⁸ 338 U.S. 396 (1949).

³²⁹ *Id.* at 403 (citation omitted).

³³⁰ See *id.*

owner's bargain. . . . He must be made whole but is not entitled to more.³³¹

Because of the problems associated with these other methodologies, the Court has consistently indicated that the comparable-sales approach represents the best evidence of market value.³³² Indeed, the Court has gone so far as to characterize other valuation methods, including replacement cost, as exceptions to the comparable-sales approach, and to hold them inapplicable whenever there are market-based transactions in similar properties.³³³ The Court offered its most dramatic statement to this effect in *United States v. New River Collieries Co.*,³³⁴ in which it held that “[w]here private property is taken for public use, and there is a market price prevailing at the time and place of the taking, that price *is* just compensation.”³³⁵ As a result, because comparable sales data were available, the Court properly held inadmissible income and replacement cost evidence.³³⁶ Only if such data are unavailable should courts resort to other methods. Furthermore, if it is necessary to resort to other methods of determining market value, courts should turn first to the income capitalization approach and then to the replacement-cost approach before resorting to historical cost valuation.

Justice Brandeis used historical cost in evaluating takings challenges to conventional rate regulation.³³⁷ At no point, however, did either Justice Brandeis or the Court suggest that cost-based methodologies are superior to the comparable-sales approach under the princi-

³³¹ 292 U.S. 246, 255 (1934) (citation omitted); *accord* 4A NICHOLS' THE LAW OF EMINENT DOMAIN, *supra* note 323, § 15.09[1], at 15-62 (noting that historical cost “is not a conclusive test, because the money may have been improvidently expended, or by reason of a change in conditions, parts of the works may have ceased to be of value, or the cost of labor and materials may have increased or decreased”).

³³² *See* 4 NICHOLS' THE LAW OF EMINENT DOMAIN, *supra* note 323, § 12B.04[3], at 12B-23 (calling the comparable-sales approach “the preferred way to compute market value”); DeBow, *supra* note 36, at 582 (stating that “it is widely understood that in practice the Supreme Court shows a strong preference for the comparable sales approach”); Lunney, *supra* note 36, at 728 (noting that the Court “has preferred that a party establish market value through the comparable sales approach”).

³³³ *See* *United States v. 50 Acres of Land*, 469 U.S. 24, 29 (1984) (“*Duncanville Landfill*”); *United States v. 564.54 Acres of Land*, 441 U.S. 506, 512–13 (1979) (“*Lutheran Synod*”); *Toronto, Hamilton & Buffalo*, 338 U.S. at 402. The Court has also suggested in dicta that the market value standard may be set aside when its application “would result in manifest injustice to owner or public.” *Duncanville Landfill*, 469 U.S. at 29 (quoting *United States v. Commodities Trading Corp.*, 339 U.S. 121, 123 (1950)). The Court has never provided much guidance as to when this exception might arise, and has rejected every attempt to invoke it. *See id.* at 30–36; *Lutheran Synod*, 441 U.S. at 514–17. The language of these opinions and the Court's failure to apply this exception strongly suggest that it is extremely narrow, at best, and possibly even empty.

³³⁴ 262 U.S. 341 (1923).

³³⁵ *Id.* at 344 (emphasis added).

³³⁶ *See id.*

³³⁷ *See supra* notes 58–70 and accompanying text.

ples of economics and fairness embodied in the Takings Clause. Instead, the Court made clear that it was sanctioning the cost-based methodologies only because market-based methodologies were unavailable.³³⁸ Implicit in this argument is the recognition that the emergence of market-based benchmarks would require a return to market-based compensation principles.

The foregoing analysis underscores the constitutional significance of both transformations that we have identified. The fundamental shift from rate regulation to access regulation makes it far easier for regulatory authorities to incorporate external reference points that reflect the demand side of the valuation equation. Because conventional rate regulations set prices that utilities can charge for final outputs, any attempt to base regulated rates on final prices is hopelessly circular. Access regulation, in contrast, alleviates this problem by allowing market-based competition to determine the prices utilities charge for final goods. It is true that the access regulation approach is somewhat circular as well. For example, regulatory authorities still must establish rates to govern the terms under which incumbent firms must provide access to competitors, and the rates they set will have some influence on the prices charged for final goods. Network access nonetheless remains only one of several inputs required to produce the final good. Therefore, if network access comprises only a small percentage of total cost, access rates will not be a significant determinant of final goods prices.

The emergence of direct, facilities-based network competition also is of considerable constitutional importance. Indeed, the emergence of direct competition undercuts the justifications for imposing access regulation as a matter of principle. But even setting aside the question whether access represents good policy, the emergence of substitute network technologies has profound implications for the implementation of any access regime. By facilitating the emergence of alternative networks capable of providing market-based indicia of competitive pricing, converging telecommunications technology is vitiating the justification for setting rates according to cost-based methodologies. Once competition leads to market benchmarks, continued reliance on cost-based methodologies will be improper, under precedent.³³⁹

c. *Partial Takings of Utility Property*

The Supreme Court's takings jurisprudence recognizes that government compensation should generally reflect the earning potential

³³⁸ See *Missouri ex rel. Southwestern Bell Tel. Co. v. Pub. Serv. Comm'n*, 262 U.S. 276, 292–94 (1923) (Brandeis, J., concurring in the judgment).

³³⁹ See *supra* notes 309–38 and accompanying text.

of the property taken. The government need not compensate for a property's going concern value when it takes the entire fee and divests the current owner of title.³⁴⁰ As the Court explained in *Kimball Laundry*, "the denial of compensation in such circumstances rests on a very concrete justification: the going-concern value has not been taken."³⁴¹ In such circumstances, "only the physical property has been condemned, leaving the owner free to move his business to a new location."³⁴² The Court further reasoned that "there is no more reason for a taker to pay for the business' going-concern value than there would be for a purchaser to pay for it who had not secured from his vendor a covenant to refrain from entering into competition with him."³⁴³

Nonetheless, the Court identified two circumstances in which compensation for the going-concern value is appropriate. The first occurs when the government takes a public utility that possesses natural monopoly characteristics.³⁴⁴ "Since a utility cannot ordinarily be operated profitably except as a monopoly, investment by the former owner of the utility in duplicating the condemned faculties could have no prospect of a profitable return."³⁴⁵ In such cases, "[t]he owner retains nothing of the going-concern value that it formerly possessed."³⁴⁶ Therefore, because taking over a public utility "has the inevitable effect of depriving the owner of the going-concern value of his business," it is properly regarded as a taking for which compensation must be paid.³⁴⁷

The second situation arises when the government physically takes less than the fee interest in the owner's property.³⁴⁸ For example, the Court in *United States v. General Motors Corp.*,³⁴⁹ noted that although the government need not compensate for a property's going-concern value when it takes the full fee interest,³⁵⁰ "[i]t is altogether another matter when the Government does not take [the owner's] entire interest, but by the form of its proceeding chops it into bits, of which it takes only what it wants, however few or minute, and leaves [the

³⁴⁰ See, e.g., *Kimball Laundry Co. v. United States*, 338 U.S. 1, 11 (1949); *United States v. Gen. Motors Corp.*, 323 U.S. 373, 379 (1945). Going-concern value represents the product of the "contribution to the earning capacity of the business of greater skill in management and more effective solicitation of patronage than are commonly given to [a particular] combination of land, plant, and equipment." *Kimball Laundry*, 338 U.S. at 9.

³⁴¹ 338 U.S. at 11.

³⁴² *Id.*

³⁴³ *Id.*

³⁴⁴ See *id.* at 12 (citing *City of Omaha v. Omaha Water Co.*, 218 U.S. 180 (1910)).

³⁴⁵ *Id.* at 12–13.

³⁴⁶ *Id.* at 13.

³⁴⁷ *Id.*

³⁴⁸ See *id.* at 14–16.

³⁴⁹ 323 U.S. 373 (1945).

³⁵⁰ See *id.* at 379.

owner] holding the remainder.”³⁵¹ Because only part of the property was taken, it was effectively impossible for the property owner simply to reestablish its business elsewhere. In such a case, the proper measure of compensation is not just the cost of the property taken, but also the going-concern value of the property as reflected by rental fees that could be obtained on the open market.³⁵²

These situations underscore the constitutional problems that would result if network access rates were based solely on direct cost and support rates that reflect the probable demand for network services. To the extent that compelled access to any particular portion of a network is justified, it must be because that portion bears natural monopoly characteristics. Because it is infeasible for the network owner to establish similar facilities elsewhere, the physical occupation of its facilities requires that the owner be compensated for the going-concern value of the property taken. In this case, the value of the property is reflected by the value of the network services provided. In addition, the partial nature of the physical taking effected by access requirements provides yet another reason for requiring the government to compensate network owners for lost profits. Access necessarily involves a physical taking that is considerably less than the full fee, thus interrupting the owner's use of the property and leaving it inextricably intertwined with others' use. Because these encumbrances effectively prevent the owner from using the property for other purposes, compensation for such a taking must reflect the property's going-concern value.

3. *Implications*

It is no doubt tempting for regulatory authorities and courts to resolve takings challenges to network regulations according to the same principles applied in conventional rate regulation cases. Those principles are based on balancing tests that regard constitutionally unproblematic those regulations backed by strong public policy justifications and having minimal economic impact. In addition, adherence to preexisting approaches allows regulators to continue employing the cost-based methodologies with which they are familiar. Rate-making authorities can thus maximize the leverage they have gained from regulatory tools developed in previous rate-making efforts.

Blind application of existing principles, however, ignores the constitutional import of the shift from rate regulation to access regulation. As noted earlier, access regulation typically requires network owners to permit permanent physical occupations of their prop-

³⁵¹ *Id.* at 382.

³⁵² *See Kimball Laundry*, 338 U.S. at 7; *Gen. Motors Corp.*, 323 U.S. at 382.

erty.³⁵³ Unlike rate regulation, access regulation effects a physical taking for which the government *must* pay compensation—without regard to the magnitude of the invasion, its impact on investment-backed expectations, or the importance of the policy interests furthered by the regulation. The Court has made clear that the regulatory takings and confiscatory rate-making precedents upon which regulatory authorities have previously relied in rejecting takings challenges do not apply to cases involving a physical taking.³⁵⁴

The Court's takings jurisprudence also makes clear that the best measure of just compensation is market value, which is best determined through actual market transactions.³⁵⁵ Although at one point the absence of external, market-determined benchmarks may have justified reliance on cost-based valuation methodologies, the emergence of platform competition and the shift from regulating outputs to regulating inputs have made it increasingly possible for regulatory authorities to determine value on the basis of actual market transactions. This shift implies that the theoretical and technological transformation of regulated-industries law commands, in turn, a similar transformation of the principles used to evaluate takings challenges to access regulation of network industries. Front-line policy makers—those in charge of implementing access regulations—have largely ignored these implications.³⁵⁶ Therefore, the obligation to enforce these principles will fall to the courts as they begin to address the merits of takings challenges to this type of regulation.

III

CURRENT POLICY APPLICATIONS

This Part applies the framework developed above to the three most salient access-related policy issues of the day: (1) access to local telephone networks, (2) access to networks of utility poles, and (3) access to high-speed broadband networks. This analysis shows how the emergence of platform competition and the shift to access regulation have made basing rates on market prices more feasible than ever before. Although we expect the level of competition in the relevant markets—which include local telephony, multichannel video programming distribution, and broadband services—to vary, the competition likely to emerge in each industry should be sufficiently robust to justify basing rates on market prices. We also demonstrate how access to each of these networks necessarily requires a permanent physical

³⁵³ See *supra* Part II.A.2.

³⁵⁴ See *supra* notes 235, 249, 267–75 and accompanying text.

³⁵⁵ See *supra* notes 286–89 and accompanying text.

³⁵⁶ See *infra* Parts III.A.1, III.B.1, III.C.1.

invasion, which adds a constitutional dimension that reinforces the economic analysis.

A. Access to Local Telephone Networks

Access to local telephone systems represented the keystone to the Telecommunications Act of 1996,³⁵⁷ which has been lauded as the most sweeping reconceptualization of telecommunications policy since the initial enactment of the Communications Act of 1934.³⁵⁸ This subpart provides an overview of the access requirements imposed on local telephone networks. It then analyzes the regulatory regime in light of the economic and constitutional principles developed above. Both sets of principles compel the conclusion that the current approach to setting access rates for local telephone networks is flawed and should be replaced by an approach that better reflects market pricing.

1. *Regulatory Framework*

In a typical narrowband network, customers connect to the telephone network through a pair of copper wires known as the local loop. Local loops terminate at a circuit switch located in the LEC's central office, which receives calls in analog format. The circuit switch then routes the calls either to another local customer whose loop is also connected to the same switch or to a designated interconnection point, called a "point of presence" (POP), where it can transfer the call to a long-distance carrier. The typical local telephone network thus performs two distinct functions. First, it allows customers to place local calls to other customers in the same geographic area, a function known as "local exchange services" (represented in Figure 1 by the connection between Customer Premises A and Customer Premises B).³⁵⁹ Second, the network connects customers to long distance carriers by providing "exchange access services" (represented in Figure 1 by the connection between Customer Premises A and the POP maintained by the long distance carrier).

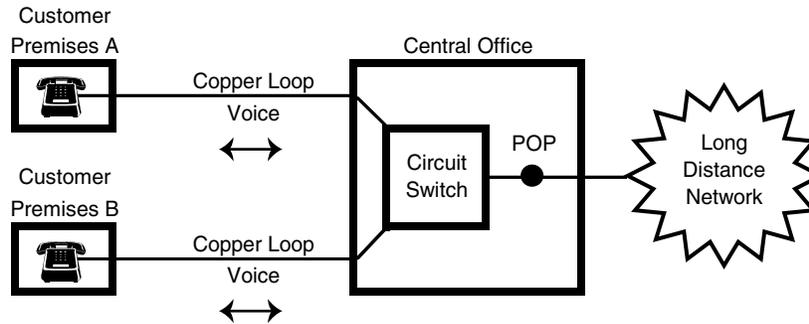
Policy makers initially regarded the entire telephone network as a natural monopoly for two reasons. First, the significant fixed costs associated with constructing the initial network of wires, switches, and other equipment caused costs to decline across all relevant volumes.

³⁵⁷ Pub. L. No. 104-104, 110 Stat. 56 (codified as amended in scattered sections of 47 U.S.C.).

³⁵⁸ Pub. L. No. 73-416, 48 Stat. 1064 (codified as amended at 47 U.S.C. §§ 151-615(b) (2000)).

³⁵⁹ If a local exchange area is particularly large, the LEC may employ more than one central office switch connected together by high-speed trunk lines to serve a single calling area.

FIGURE 1: TYPICAL CONFIGURATION OF A BASIC LOCAL TELEPHONE NETWORK



Second, because any local telephone network's value to a particular user is determined in large part by the number of other users connected to the same network, local telephone systems exhibit network economic effects.³⁶⁰

Over time, policy makers realized that portions of the telephone network could be competitive. Usually at the prodding of the courts, the FCC began to allow and then to encourage competition in various portions of the overall telephone system, such as the markets for telephone-related equipment³⁶¹ and long-distance services.³⁶² This initial movement culminated in the breakup of AT&T,³⁶³ which was aimed at preventing the Bell System from using its local telephone service monopoly to impede competition in the long-distance and equipment markets.³⁶⁴ This decision, known as the Modified Final Judgment (MFJ), did not refute the notion that local telephone service is a natural monopoly.³⁶⁵ Therefore, neither the FCC nor the courts attempted to promote competition at the local level.

Over time, dramatic decreases in the cost of switching and transmission technology led policy makers to question whether local telephone service remained a natural monopoly. The initial step in

³⁶⁰ See *supra* notes 116–17 and accompanying text.

³⁶¹ See, e.g., *Hush-A-Phone Corp. v. United States*, 238 F.2d 266, 268 (D.C. Cir. 1956) (allowing continued use of privacy equipment attached to telephones); *Use of the Carterfone Device in Message Toll Tel. Serv.*, 13 F.C.C.2d 420, 424 (1968) (striking down a tariff that effectively rendered a two-way radio phone extension uneconomical).

³⁶² See, e.g., *MCI Telecomms. Corp. v. FCC*, 561 F.2d 365, 380 (D.C. Cir. 1977) (rejecting the FCC's refusal to allow MCI to establish a long-distance service to compete with AT&T); *MTS and WATS Market Structure, Report and Third Supplemental Notice of Inquiry and Proposed Rulemaking*, 81 F.C.C.2d 177, 202–04 (1980).

³⁶³ See *United States v. AT&T Co.*, 552 F. Supp. 131, 222–25 (D.D.C. 1982), *aff'd mem. sub nom. Maryland v. United States*, 460 U.S. 1001 (1983).

³⁶⁴ See *id.* For a complete discussion of the theories underlying the breakup of AT&T, see Noll & Owen, *supra* note 121, at 295–326.

³⁶⁵ See *Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, Notice of Proposed Rulemaking*, 11 F.C.C.R. 14171, 14173–74 ¶ 4 (1996).

fostering competition in local telephony was the FCC's *Expanded Interconnection* proceeding,³⁶⁶ which attempted to promote competition in local telephone service by nurturing the development of a new category of carriers known as Competitive Access Providers (CAPs).³⁶⁷ The increasing feasibility of competition in local telephony eventually culminated with the enactment of the local competition provisions of the 1996 Act.³⁶⁸

a. *The Expanded Interconnection Proceeding*

When they first emerged, CAPs focused on offering corporate customers dedicated connections that allowed high-volume long distance customers to bypass the incumbent LEC's facilities by transporting calls directly from the customer's premises to those of the long-distance carrier's POP.³⁶⁹ CAPs also began to offer partial bypass services that covered either the segment running from the customer's location to the incumbent LEC's central office (a service known as "special access") or the segment running from the central office to the long-distance carrier's POP (a service known as "switched transport").

CAP services had many advantages over the services provided by the incumbent LECs. First, CAP networks tended to employ more modern technology, such as fiber-optic rings, that allowed the networks to offer a greater range of features and a more attractive price structure.³⁷⁰ Moreover, unlike with incumbent LECs, the FCC did not require that CAPs provide uniform services according to published tariffs. As a result, CAPs were able to respond more quickly to market demands and to tailor pricing and terms of service to each customer's particular needs.³⁷¹ Lastly, the untariffed nature of CAP services allowed them to avoid the cross subsidies embedded in the FCC's system of access charges.³⁷²

³⁶⁶ See *Expanded Interconnection with Local Telephone Co. Facilities*, Second Report and Order and Third Notice of Proposed Rulemaking, 8 F.C.C.R. 7374 (1993) ("*Switched Transport Order*"); *Expanded Interconnection with Local Telephone Co. Facilities*, Report and Order and Notice of Proposed Rulemaking, 7 F.C.C.R. 7369 (1992) ("*Special Access Order*").

³⁶⁷ See *infra* Part III.A.1.a.

³⁶⁸ See *infra* Part III.A.1.b.

³⁶⁹ For a detailed description of regulations designed to encourage the development of CAPs, see Alexander C. Larson & Douglas R. Mudd, *Collocation and Telecommunications Policy: A Fostering of Competition on the Merits?*, 28 CAL. W. L. REV. 263, 274-84 (1992).

³⁷⁰ Specifically, fiber optics provided dramatic improvements in the amount of available bandwidth. They also decreased service costs in general and made them much less distance-sensitive. Finally, fiber optics allowed CAPs to take advantage of the efficiencies made possible by computer processing, such as improved switching and digital compression. *Id.* at 275; David J. Teece, *Telecommunications in Transition: Unbundling Reintegration, and Competition*, 1 MICH. TELECOMM. & TECH. L. REV. 47, 68 (1994-1995).

³⁷¹ Larson & Mudd, *supra* note 369, at 274-75.

³⁷² Teece, *supra* note 370, at 57.

CAPs were also important for a far more fundamental reason. The eventual expansion of CAP networks to cover the entire core business districts of major metropolitan areas made it possible for CAPs to offer local telephone service in direct competition with the incumbent LECs.³⁷³ The FCC recognized that in order for CAPs to compete with the major LECs,³⁷⁴ they needed to interconnect with the LECs' networks on the same terms and conditions that the LECs provided for their own circuits. As a result, the FCC gave CAPs the right to install in LECs' central offices any equipment necessary to terminate calls.³⁷⁵ The FCC believed that this right, dubbed "physical collocation," was necessary to ensure that the interconnection provided to the CAPs was comparable to that used by LECs. If the LECs' central offices lacked the physical space to accommodate physical collocation, the LECs could instead provide "virtual collocation" which is the installation and maintenance of equipment on their property that allowed the requesting carrier to interconnect with the LECs' networks through a location outside of the LECs' central offices.³⁷⁶ Price caps

³⁷³ See *id.* at 66, 78 (describing CAP entry into local telephone service in New York, Chicago, and Grand Rapids).

³⁷⁴ The FCC limited these expanded interconnection requirements to Tier I LECs, which it defined as LECs with revenues of at least \$100 million. See Expanded Interconnection with Local Telephone Co. Facilities, Second Report and Order and Third Notice of Proposed Rulemaking, 8 F.C.C.R. 7374, 7376 ¶ 1 & n.1 (1993) ("*Switched Transport Order*"); Expanded Interconnection with Local Telephone Co. Facilities, Report and Order and Notice of Proposed Rulemaking, 7 F.C.C.R. 7369, 7372 n.1, 7398 ¶ 57 (1992) ("*Special Access Order*").

³⁷⁵ See *Switched Transport Order*, 8 F.C.C.R. at 7391–92 ¶ 29; *Special Access Order*, 7 F.C.C.R. at 7389–90 ¶ 39, 7391 ¶ 42; see also *Bell Atl. Tel. Cos. v. FCC*, 24 F.3d 1441, 1444 ("[T]he CAP strings its cable to the LEC central office. The LEC must then turn over space within the central office in which the CAP may install and operate its circuit terminating equipment."). This requirement applied only to central office equipment needed to terminate basic transmission facilities. It did not cover equipment, such as enhanced services or customer premises equipment, unrelated to the competitive provision of transmission services. See *Switched Transport Order*, 8 F.C.C.R. at 7412–13 ¶ 63; *Special Access Order*, 7 F.C.C.R. at 7413–14 ¶ 93. This was by no means the only obstacle hindering CAPs from emerging as direct competitors of LECs. The existing tariffs required customers purchasing partial bypass services from the CAPs to pay for both the special access and the switched transport segments, even though they used the CAP to bypass one of the legs. This forced CAP customers to pay twice for the same service, rendering CAP pricing uneconomical. In order to cure this problem, the FCC ordered Tier I LECs to unbundle their special access and switched transport tariffs. See *Switched Transport Order*, 8 F.C.C.R. at 7418 ¶ 75; *Special Access Order*, 7 F.C.C.R. at 7424–25 ¶ 120.

³⁷⁶ See *Switched Transport Order*, 8 F.C.C.R. at 7393–94 ¶ 31; *Special Access Order*, 7 F.C.C.R. at 7390–91 ¶ 41. The FCC also approved virtual collocation if both parties agreed that it was preferable to physical collocation or if state regulatory authorities determined either that virtual collocation was preferable or that the LEC should decide which form to allow. See *Switched Transport Order*, 8 F.C.C.R. at 7393–95 ¶¶ 31–32; *Special Access Order*, 7 F.C.C.R. at 7390–91 ¶¶ 40–41. The FCC set specific conditions on LECs' provision of virtual collocation in order to minimize technical differences between physical and virtual collocation. First, the FCC required LECs to permit interconnectors using virtual collocation to designate the type of equipment dedicated to their use, although the intercon-

governed interconnection rates for both physical and virtual collocation. As in other price-cap regimes, the initial rates were based on historical cost.³⁷⁷ The FCC also rejected arguments that the physical collocation requirement violated the Takings Clause on the ground that physical takings doctrine was not applicable to public utility property, which was governed exclusively by the framework applied to regulatory takings.³⁷⁸ Even assuming that physical collocation did constitute a taking, the FCC argued in the alternative that the compensation it provided was sufficient to render the requirement constitutional.³⁷⁹ State regulatory authorities issued similar orders in order to facilitate CAP entry into local telephone service.³⁸⁰

The D.C. Circuit struck down the FCC's collocation rules in *Bell Atlantic Telephone Cos. v. FCC* on the ground that they exceeded the FCC's statutory authority.³⁸¹ The court reasoned that granting CAPs the right to place equipment in the LECs' central offices represented precisely the type of permanent physical occupation that constituted a per se taking under *Loretto*.³⁸² As a result, the physical collocation requirement ran afoul of the principle that statutes should not be construed to create "an identifiable class of cases in which application of a statute will necessarily constitute a taking."³⁸³

The FCC responded to the *Bell Atlantic* decision by ceasing to mandate physical collocation and by giving the LECs the option of providing virtual collocation.³⁸⁴ The FCC continued to maintain that mandatory physical collocation did not constitute a per se taking, but argued that the virtual collocation option eliminated any potential constitutional infirmity.³⁸⁵ Before the courts could address the valid-

nectors bore any additional costs associated with their choice of equipment. In addition, the FCC required LECs to install, maintain, and repair virtual collocation equipment as regularly and with the same failure rates that applied to the LEC's own equipment. Finally, LECs had to allow interconnectors to monitor and control the equipment remotely. See *Switched Transport Order*, 8 F.C.C.R. at 7392 ¶ 30; *Special Access Order*, 7 F.C.C.R. at 7392-94 ¶¶ 44-46.

³⁷⁷ See *Switched Transport Order*, 8 F.C.C.R. at 7419 ¶ 79; *Special Access Order*, 7 F.C.C.R. at 7428-29 ¶ 127; Expanded Interconnection with Local Telephone Co. Facilities, Notice of Proposed Rulemaking and Notice of Inquiry, 6 F.C.C.R. 3259, 3267 ¶¶ 52-53 (1991).

³⁷⁸ See *Switched Transport Order*, 8 F.C.C.R. at 7445 ¶ 144; *Special Access Order*, 7 F.C.C.R. at 7476-83 ¶¶ 230-40.

³⁷⁹ See *Switched Transport Order*, 8 F.C.C.R. at 7475 ¶ 144; *Special Access Order*, 7 F.C.C.R. at 7482-83 ¶ 240.

³⁸⁰ See *Special Access Order*, 7 F.C.C.R. at 7374-75 ¶ 7 & nn.10-12.

³⁸¹ 24 F.3d 1441, 1446-47 (D.C. Cir. 1994).

³⁸² See *id.* at 1445-47.

³⁸³ *Id.* at 1445 (quoting *United States v. Riverside Bayview Homes, Inc.*, 474 U.S. 121, 128 n.5 (1985)).

³⁸⁴ See Expanded Interconnection with Local Telephone Co. Facilities, Memorandum Opinion and Order, 9 F.C.C.R. 5154, 5163 ¶¶ 22-23 (1994).

³⁸⁵ *Id.*

ity of these revised regulations, the entire scheme was rendered moot by the collocation provisions of the 1996 Act.³⁸⁶

b. *The Local Competition Provisions of the 1996 Act*

The local competition provisions of the 1996 Act were designed to “open[] all communications services to competition,” including local telephone service, by eliminating local providers’ bottleneck control over the elements needed to originate or terminate telephone calls.³⁸⁷ Rather than regulating the retail prices charged for local telephone service, the 1996 Act focuses on regulating the price at which new entrants can obtain access to key elements of an incumbent LEC’s network. As such, it represents a prime example of the shift from output regulation to input regulation taking place throughout regulated industries.

Congress envisioned that competition in local telephone markets might emerge through one of three paths.³⁸⁸ First, a new entrant might obtain *all* of the necessary elements from the incumbent LEC and resell them.³⁸⁹ Second, a new entrant might construct an entirely new network.³⁹⁰ Because the inability to complete calls to the incumbent LEC’s customers would render a new network relatively unattractive, the Act requires that incumbent LECs allow any requesting telecommunications carrier to interconnect with their networks “at any technically feasible point.”³⁹¹ The Act also requires that the interconnection be equal in quality to that which the incumbent LEC provides to itself or a subsidiary³⁹² and that it be provided according to “rates, terms, and conditions that are just, reasonable, and nondiscriminatory.”³⁹³

Congress recognized, however, that not every facilities-based entrant could have its entire network in place when it began to offer local service.³⁹⁴ Therefore, to allow competition to emerge before entrants had fully established their networks, Congress established a third path for entering local telephone markets by requiring that incumbent LECs provide other carriers with access to all of their network elements on an unbundled basis. The LECs must provide access

³⁸⁶ See *Pac. Bell v. FCC*, 81 F.3d 1147 (D.C. Cir. 1996) (table decision).

³⁸⁷ See H.R. REP. NO. 104-204, pt. I, at 48–49, *reprinted in* 1996 U.S.C.C.A.N. 1, 11–13.

³⁸⁸ See Implementation of Local Competition Provisions of the Telecommunications Act of 1996, First Report and Order, 11 F.C.C.R. 15499, 15509 ¶ 12 (1996) (“*Local Competition Order*”); *Verizon Communications, Inc. v. FCC*, 535 U.S. 467, 491–92 (2002).

³⁸⁹ See 47 U.S.C. § 251(b)(1), (c)(4) (2000).

³⁹⁰ *Verizon*, 535 U.S. at 491.

³⁹¹ 47 U.S.C. § 251(c)(2)(B).

³⁹² *Id.* § 251(c)(2)(C).

³⁹³ *Id.* § 251(c)(2)(D).

³⁹⁴ S. CONF. REP. NO. 104-230, at 148 (1996).

“at any technically feasible point on rates, terms, and conditions that are just, reasonable, and nondiscriminatory.”³⁹⁵

Typically, to interconnect and have access to unbundled network elements, the requesting carrier must install some of its equipment on the incumbent LEC's property. Thus, mandatory interconnection presupposes that competitors will establish physical connections to the incumbent LEC's network.³⁹⁶ In addition, compelled access to elements of the incumbent LEC's network presupposes some ability to combine those elements with the new entrant's facilities.³⁹⁷ The local loop, which more than any other network element has natural monopoly characteristics, is the element that a requesting carrier is most likely to access in this manner. A carrier who requests unbundled access to the local loop must terminate that loop by connecting the loop to its switching equipment.

As a result, the 1996 Act includes collocation requirements similar to those the FCC adopted in its *Expanded Interconnection* proceedings.³⁹⁸ Specifically, the Act requires incumbent LECs to permit “physical collocation of equipment necessary for interconnection or access to unbundled network elements.”³⁹⁹ When technical considerations or space limitations render physical collocation impractical, incumbent LECs need only provide virtual collocation.⁴⁰⁰

The 1996 Act requires that prices for interconnection and access to unbundled network elements be determined through voluntary negotiations between the incumbent LEC and the requesting carrier, at times aided by a state public utility commission's mediation.⁴⁰¹ If the parties are unable to reach a voluntary agreement, the Act gives state public utility commissions the authority to set rates through binding arbitration, which would be governed by one of two statutory mandates.⁴⁰² First, the arbitrators shall set rates for interconnection and access to unbundled network elements that are “based on the cost . . .

³⁹⁵ 47 U.S.C. § 251(c)(3). In determining which network elements are subject to the unbundled access requirement, the statute requires that the FCC consider whether “access to such network elements as are proprietary in nature is *necessary*” and whether “the failure to provide access to such network elements would *impair* the ability of the telecommunications carrier seeking access to provide the services that it seeks to offer. *Id.* § 251(d)(2)(A)–(B) (emphasis added).

³⁹⁶ See Implementation of the Local Competition Provisions of the Telecommunications Act of 1996, First Report and Order, 11 F.C.C.R. 15499, 15514 ¶ 26 (1996) (“*Local Competition Order*”) (defining interconnection as “the physical linking of two networks for the mutual exchange of traffic”).

³⁹⁷ *Id.* at 15514–15.

³⁹⁸ See *supra* notes 375–79 and accompanying text.

³⁹⁹ 47 U.S.C. § 251(c)(6).

⁴⁰⁰ See *id.*; see also *supra* notes 376, 384 and accompanying text (describing similar virtual collocation provision with respect to CAPs).

⁴⁰¹ 47 U.S.C. § 252(a)(1)–(2).

⁴⁰² See *id.* § 252(b), (c)(2).

of providing the interconnection or network element,” provided that cost is “determined without reference to a rate-of-return or other rate-based proceeding.”⁴⁰³ Second, the Act requires that compensation for traffic originating on the network of one LEC and terminating on the network of another be governed by the principle of “reciprocal compensation.”⁴⁰⁴ This requirement “provide[s] for the mutual and reciprocal recovery by each carrier of costs associated with the transport and termination on each carrier’s network facilities of calls that originate on the network facilities of the other carrier.”⁴⁰⁵ Such costs, moreover, must be determined “on the basis of a reasonable approximation of the additional costs of terminating such calls.”⁴⁰⁶

c. *Implementation of the 1996 Act*

The FCC implemented the local competition provisions of the 1996 Act in a massive order issued just three months after the statute’s enactment.⁴⁰⁷ The order dealt encyclically with a wide range of implementation-related issues, including the scope of the unbundling requirements, which gave rise to the Supreme Court’s decision in *AT&T Corp. v. Iowa Utilities Board*.⁴⁰⁸ For our purposes, however, it is suffi-

⁴⁰³ *Id.* § 252(d)(1)(A)(i). The statute further requires that rates be “nondiscriminatory,” *id.* § 252(d)(1)(A)(ii), and that they “may include a reasonable profit,” *id.* § 252(d)(1)(B).

⁴⁰⁴ *See id.* § 251(b)(5).

⁴⁰⁵ *Id.* § 252(d)(2)(A)(i).

⁴⁰⁶ *Id.* § 252(d)(2)(A)(ii). The statute, however, specifically allows carriers to waive mutual recovery in favor of other arrangements, such as bill-and-keep systems. *Id.* § 252(d)(2)(B)(i).

⁴⁰⁷ Implementation of the Local Competition Provisions of the Telecommunications Act of 1996, First Report and Order, 11 F.C.C.R. 15499 (1996) (“*Local Competition Order*”).

⁴⁰⁸ 525 U.S. 366 (1999). Initially, the FCC broadly defined the elements subject to unbundled access without considering the availability of equally cost-effective inputs. *See Local Competition Order*, 11 F.C.C.R. at 15642 ¶ 283, 15643 ¶ 285. The FCC gave a similarly broad interpretation to the equipment subject to physical collocation. *See id.* at 15628 ¶ 250, 15794 ¶ 579. The Supreme Court struck down the FCC’s interpretation of the scope of the unbundled access requirements as an improper construction of the statutory requirements that a network element be “necessary” before it is subject to unbundled access and that withholding access to that element would “impair” the requesting carrier’s ability to provide such service. *See Iowa Utils. Bd.*, 525 U.S. at 387–92. The D.C. Circuit applied similar reasoning in striking down the FCC’s initial collocation orders. *See GTE Serv. Corp. v. FCC*, 205 F.3d 416, 422–24 (D.C. Cir. 2000) (citing *Iowa Utils. Bd.*, 525 U.S. at 389–90). On remand, the FCC reinterpreted the “necessary” and “impair” standards in a way designed to give those terms substance, only to see those provisions struck down once again. *See Implementation of Local Competition Provisions in Telecommunications Act of 1996*, Third Report and Order and Fourth Notice of Proposed Rulemaking, 15 F.C.C.R. 3696, 3712 ¶ 22 (1999) (“*UNE Remand Order*”), *remanded sub nom.* U.S. Telecom Ass’n v. FCC, 290 F.3d 415, 422–28 (D.C. Cir. 2002), *cert. denied*, 71 U.S.L.W. 3416 (U.S. Mar. 24, 2003) (No. 02-858). The FCC also revised its rules to limit collocation to equipment designed primarily to provide the requesting carrier either with interconnection that is “equal in quality” to that provided by the incumbent LEC for its own services, or with “nondiscriminatory access” to an unbundled network element. Deployment of Wireline Services Offering Advanced Telecommunications Capability, Fourth Report and Order, 16

cient to focus on the FCC's methodology for setting interconnection, unbundled access, and physical collocation rates.

The FCC has implemented the provisions governing rates for interconnection and access to unbundled network elements using a methodology known as Total Element Long Run Incremental Cost (TELRIC). TELRIC bases rates on the element's "economic costs," which the FCC defines as the sum of the incremental costs directly attributable to the specified element and a reasonable allocation of common costs.⁴⁰⁹ TELRIC's most distinctive feature is that it assesses both incremental and common costs on a forward-looking basis by focusing on a network element's replacement cost, rather than its historical cost.⁴¹⁰ The FCC believed that basing rates on forward-looking incremental cost represents the best way to replicate the conditions of a competitive market.⁴¹¹ TELRIC further accommodates technological change by requiring that costs be determined "based on the use of the most efficient . . . technology currently available and the lowest cost network configuration, given the existing location of the incumbent LEC's wire centers."⁴¹² Finally, the FCC declined to incorporate an element reflecting the opportunity cost to a network owner of providing competitors unbundled access to its network elements.⁴¹³

Although the statutory mandate underlying TELRIC ostensibly applies only to compensation for interconnection and access to unbundled network elements, the FCC determined that the same pricing rules should govern compensation for physical collocation.⁴¹⁴ In

F.C.C.R. 15435, 15452-60 ¶¶ 32-44 (2001) ("*Collocation Remand Order*"), *aff'd sub nom.* Verizon Tel. Cos. v. FCC, 292 F.3d 903 (D.C. Cir. 2002). The FCC subsequently adopted a new construction of "impair" designed to address the concerns raised by the D.C. Circuit. With respect to business customers, the FCC entered a presumption that local switching would no longer be subject to UNE access. State regulators would have ninety days to rebut this presumption in particular cases. With respect to mass market customers, the FCC gave state regulators nine months to determine whether eliminating access to switching would impair competitors in particular markets. News Release, FCC Adopts New Rules for Network Unbundling Obligations of Incumbent Local Phone Carriers, *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-231344A1.pdf (Feb. 20, 2003). The text of the order has not yet been released.

⁴⁰⁹ See 47 C.F.R. § 51.505(a) (2001). TELRIC properly refers only to the first of these two components. For simplicity, however, this Article refers to both parts of the methodology collectively as TELRIC.

⁴¹⁰ *Local Competition Order*, 11 F.C.C.R. at 15857-59 ¶¶ 704-707 (citing 47 U.S.C. § 252(d)(1)(A)(i) (2000)). TELRIC avoids the problems caused by the distinction between fixed and variable costs by measuring incremental costs from a "long run" perspective, defined as a period long enough that all of a firm's costs become variable or avoidable. See *id.* at 15845 ¶ 677, 15851 ¶ 692.

⁴¹¹ See *id.* at 15846-47 ¶ 679.

⁴¹² 47 C.F.R. § 51.505(b)(1).

⁴¹³ See *Local Competition Order*, 11 F.C.C.R. at 15859 ¶ 709.

⁴¹⁴ *Id.* at 15816 ¶ 629. The FCC reasoned that physical collocation is simply a method of obtaining interconnection and access to unbundled network elements and, as such, should be priced in the same fashion. See *id.*

addition, the FCC determines that TELRIC-based rates provide an appropriate basis for reciprocal compensation.⁴¹⁵ TELRIC thus governs all of the important pricing aspects of the access regime created by the 1996 Act.

In so ruling, the FCC rejected arguments that TELRIC violates the Takings Clause. Whereas in its *Expanded Interconnection* proceedings, the FCC argued that takings of public utility property are governed by the Court's regulatory takings jurisprudence,⁴¹⁶ it later ruled that the guiding principle for determining whether such regulation violates the Constitution is whether the rates are confiscatory.⁴¹⁷ Alternatively, even if physical collocation constitutes a physical taking, the FCC found that its rate-making methodology satisfies the just-compensation standard. Although the government must pay the fair market value of the property taken, it need not allow recovery of monopoly rents.⁴¹⁸ The FCC reaffirmed this reasoning in its *Collocation Order* and its *Collocation Reconsideration Order*.⁴¹⁹

The Supreme Court upheld TELRIC as a matter of statutory construction in *Verizon Communications, Inc. v. FCC*.⁴²⁰ As several lower

⁴¹⁵ 47 C.F.R. § 51.705(a)(1) (requiring that reciprocal compensation be determined on the basis of forward-looking economic costs pursuant to the methodology governing pricing for interconnection and access to unbundled network elements); *Local Competition Order*, 11 F.C.C.R. at 16025–26 ¶ 1058 (ruling that a reasonable allocation of common costs represents an appropriate “additional cost” under the standard for reciprocal compensation). The FCC allowed for two alternatives. First, state public utility commissions could adopt a proxy range set by the FCC (at 0.2 and 0.4 cents per minute for termination). *See Local Competition Order*, 11 F.C.C.R. at 16024 ¶ 1055, 16026–28 ¶¶ 1060–62. The Eighth Circuit struck down the use of proxy prices in *Iowa Util. Bd. v. FCC*, 219 F.3d 744, 756–57 (8th Cir. 2000), *rev'd on other grounds sub nom. Verizon Communications, Inc. v. FCC*, 535 U.S. 467 (2002). This portion of the Eighth Circuit's decision does not appear to have been challenged before the Supreme Court. Second, state PUCs could instead impose “bill and keep” arrangements so long as the traffic flowing in each direction is roughly equal. *Local Competition Order*, 11 F.C.C.R. at 16024 ¶ 1055, 16054–58 ¶¶ 1111–18. The FCC recently sought comment on whether it should abandon TELRIC for reciprocal compensation in favor of “bill and keep.” Developing a Unified Intercarrier Compensation Regime, Notice of Proposed Rulemaking, 16 F.C.C.R. 9610, 9634–37 ¶¶ 69–77 (2001).

⁴¹⁶ *See supra* notes 378, 384 and accompanying text.

⁴¹⁷ *See Local Competition Order*, 11 F.C.C.R. at 15869–70 ¶ 733 (citing *Duquesne Light Co. v. Barasch*, 488 U.S. 299, 307 (1989)).

⁴¹⁸ *Id.* at 15872 ¶ 740 (citing *Lord Mfg. Co. v. United States*, 84 F. Supp. 748, 755–56 (Ct. Cl. 1949)); *see also id.* at 15811 ¶ 617, 15811 ¶ 818.

⁴¹⁹ *See* Deployment of Wireline Services Offering Advanced Telecommunications Capability and Implementation of the Local Competitions Provisions of the Telecommunications Act of 1996, Order on Reconsideration and Second Further Notice of Proposed Rulemaking in CC Docket No. 98–147 and Fifth Further Notice of Proposed Rulemaking in CC Docket No. 96–98, 15 F.C.C.R. 17806, 17838–39 ¶ 68 (2000) (“*Collocation Reconsideration Order*”); Deployment of Wireline Services Offering Advanced Telecommunications Capability, First Report and Order and Notice of Proposed Rulemaking, 14 F.C.C.R. 4761, 4778–79 ¶ 31 (1999) (“*Collocation Order*”).

⁴²⁰ 535 U.S. 467 (2002).

courts had done previously,⁴²¹ the Court declined to reach the merits of the underlying takings claim. Instead, it explicitly adopted what its previous decisions clearly implied—that takings challenges to rate-making methodologies were generally inappropriate until the methodology in question had been embodied in an actual rate order. Although the Court suggested that a rate-making methodology might have sweeping implications that would justify addressing its constitutionality on its face, the methodology before the Court did not call for such an evaluation.⁴²²

2. *Economic Arguments in Favor of Market-Based Pricing*

As Part I demonstrated, the best way to promote economic efficiency when compelling access to an input is to price the input at its market value. This pricing scheme promotes allocative efficiency by providing the signals that firms need in order to calibrate the amount of each input purchased and to ensure that they are employing the optimal mix of possible inputs.⁴²³ Market-based pricing also promotes dynamic efficiency by signaling to incumbents and new entrants the need to invest in additional capacity.⁴²⁴ As Justice Breyer noted in his separate opinion in *Iowa Utilities Board*:

[A] sharing requirement may diminish the original owner's incentive to keep up or to improve the property by depriving the owner of the fruits of value-creating investment, research, or labor. . . . [One cannot] guarantee that firms will undertake the investment necessary to produce complex technological innovations knowing that any competitive advantage deriving from those innovations will be dissipated by the sharing requirement. The more complex the facilities, the more central their relation to the firm's managerial responsibilities, the more extensive the sharing demanded, the more likely these costs will become serious. And the more serious they become, the more likely they will offset any economic or competitive gain that a sharing requirement might otherwise provide.⁴²⁵

⁴²¹ See *Tex. Office of Pub. Util. Counsel v. FCC*, 183 F.3d 393, 428–29 (5th Cir. 1999), *cert. granted sub nom.* *GTE Serv. Corp. v. FCC*, 530 U.S. 1213, *cert. dismissed*, 531 U.S. 975 (2000); *Iowa Utils. Bd. v. FCC*, 120 F.3d 753, 818 (8th Cir. 1997), *rev'd in part on other grounds sub nom.* *AT&T v. Iowa Utils. Bd.*, 525 U.S. 366 (1999); *US W. Communications, Inc. v. Minn. Pub. Utils. Comm'n*, 55 F. Supp. 2d 968, 990 (D. Minn. 1999); *Southwestern Bell Tel. Co. v. AT&T Communications of Southwest, Inc.*, No. A-97-CA-132, 1998 WL 657717, at *12 (W.D. Tex. Aug. 31, 1998).

⁴²² *Verizon*, 535 U.S. at 522–25.

⁴²³ See discussion *supra* Part I.B.1.

⁴²⁴ See discussion *supra* Part I.B.1.

⁴²⁵ 525 U.S. at 428–29 (Breyer, J., concurring in part and dissenting in part) (citation omitted); *accord Verizon*, 535 U.S. at 551–52 (Breyer, J., concurring in part and dissenting in part) (noting that compelling incumbents to share the cost-reducing benefits of a successful innovation destroys the incumbents' incentives to innovate in the first place).

In addition, “compulsory sharing can have significant administrative and social costs inconsistent with the Act’s purposes.”⁴²⁶ If taken to an extreme, “[r]ules that force firms to share *every* resource or element of a business would create not competition, but pervasive regulation, for the regulators, not the marketplace, would set the relevant terms.”⁴²⁷

Thus, the best way to promote economic efficiency is to base access rates on the price the input in question would command on the open market. Such prices are easy to determine when comparable inputs are purchased in external markets.⁴²⁸ Although local telephone service has long been regarded as a natural monopoly in which direct competition is impossible, the emergence of platform competition provides a wide range of possible external markets that can serve as bases for determining market value. New entrants have followed the lead of the CAPs and have constructed fiber optic networks that offer increasing competition with the incumbent LECs’ networks.⁴²⁹ Because they are unlikely to be regarded as “incumbent local exchange carriers” under the 1996 Act, new fiber optic carriers are likely to be exempt from Section 251(c)’s unbundled access, reasonable interconnection, and collocation requirements.⁴³⁰ As a result, their emergence promises to provide market-based benchmarks for pricing each of those access requirements. Actual prices charged will reflect regulation rather than the interaction of supply and demand.⁴³¹

In addition, providers of wireless telephone services have successfully emerged as direct competitors to the incumbent LECs. The FCC chose to deploy the first generation of wireless devices, comprised of analog cellular telephony, by issuing only two licenses per city, with one of those licenses automatically going to the incumbent LEC.⁴³² As a result, wireless initially offered only modest improvements to the competitive environment. The arrival of second generation wireless

⁴²⁶ *Iowa Utils. Bd.*, 525 U.S. at 428 (Breyer, J., concurring in part and dissenting in part).

⁴²⁷ *Id.* at 429 (Breyer, J., concurring in part and dissenting in part).

⁴²⁸ See SIDAK & SPULBER, *supra* note 39, at 275, 319, 321.

⁴²⁹ See Evan Ramstead & Kortney Stringer, *Road Kill: In Race to Lay Fiber, Telecom Firms, Wreak Havoc on City Streets*, WALL ST. J., Feb. 27, 2001, at A1 (describing recent efforts to lay fiber in Atlanta, Austin, Boston, Cincinnati, Dallas, Kansas City, San Antonio, Portland, Richmond, and Washington, D.C.).

⁴³⁰ See 47 U.S.C. § 251(c)(2)–(3), (6) (2000).

⁴³¹ The one area in which these firms are unlikely to be able to provide a market-based benchmark is the transport and termination of calls. To the extent that fiber optic providers offer telecommunications services to the general public, they are likely to be considered “local exchange carriers” subject to § 251(b). If so, compensation for the transport and termination of calls by those providers will be governed by TELRIC by virtue of the 1996 Act’s reciprocal compensation provisions. See *id.* § 251(b)(5).

⁴³² See Inquiry Into the Use of the Bands 825–845 MHz & 870–890 MHz for Cellular Communications Systems, Report and Order, 86 F.C.C. 2d 469, 476–93 ¶¶ 15–47 (1981).

devices, known as “Personal Communication Services” (PCS), diversified the market still further by significantly increasing the number of licenses available for wireless telephony.⁴³³ As a result, eighty percent of the U.S. population can choose from among five different wireless providers.⁴³⁴ Once third generation wireless devices (“3G”) are fully deployed, the wireless industry is likely to provide sufficient competition to drive market-prices towards efficient levels.

The wireless industry’s emergence is important because, unlike fiber optic carriers, wireless telephone providers are not considered “local exchange carriers” under the 1996 Act.⁴³⁵ As a result, unlike fiber optic carriers,⁴³⁶ Section 251(c) does not govern the terms under which they provide interconnection, unbundled access, or collocation access to their networks, nor does Section 251(b) govern the terms under which they transport and terminate calls. Although Congress has given the FCC the authority to regulate the terms under which wireless carriers interconnect with each other, the FCC has declined to do so.⁴³⁷ As a result, wireless carriers determine their terms

⁴³³ See Amendment of Commission’s Rules to Establish New Personal Communications Services, Second Report and Order, 8 F.C.C.R. 7700, 7732–33 ¶¶ 73–77 (1993); Thomas W. Hazlett, *The Wireless Craze, the Unlimited Bandwidth Myth, the Spectrum Auction Faux Pas, and the Punchline to Ronald Coase’s “Big Joke”*: An Essay on Airwave Allocation Policy, 14 HARV. J.L. & TECH. 335, 516–17 (2001).

⁴³⁴

Total Number of Providers in a County	Pct. of U.S. Population Contained in those Counties
3 or more	94.1%
4 or more	88.7%
5 or more	80.4%
6 or more	53.1%
7 or more	21.2%

Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993: Annual Report and Analysis of Competitive Market Conditions with Respect to Commercial Mobile Services, Seventh Report, 17 F.C.C.R. 12985, 13095 app. C, tbl.5 (2002).

⁴³⁵ Implementation of the Local Competition Provisions of the Telecommunications Act of 1996, First Report and Order, 11 F.C.C.R. 15499, 15994–95 ¶ 1001, 15995–96 ¶¶ 1004, 1006 (1996) (“*Local Competition Order*”). Although wireless providers are under no obligation to *provide* interconnection or access to their network elements, the FCC has ruled that they are “telecommunications carriers” who are eligible to *request* interconnection and access to unbundled network elements from incumbent LECs. See *id.* at 15998–16000 ¶¶ 1012–13.

⁴³⁶ See *supra* note 431.

⁴³⁷ Interconnection & Resale Obligations Pertaining to Commercial Mobile Radio Services, Fourth Report and Order, 15 F.C.C.R. 13523, 13534 ¶ 28 (2000) (“*CMRS Interconnection Order*”). This order culminated protracted regulatory proceedings dating back to 1993, when the FCC issued a notice requesting comment whether it should require wireless providers to provide interconnection to other wireless providers. See Implementation of Sections 3(n) & 332 of Communications Act, Notice of Proposed Rulemaking, 8 F.C.C.R. 7988, 8001–02 ¶ 71 (1993). When the FCC issued the order resulting from this notice, however, it declined to resolve the issue. See Implementation of Sections 3(n) & 332 of Communications Act, Second Report and Order, 9 F.C.C.R. 1411, 1499–1500

of interconnection through arms-length negotiations. These terms can thus provide the type of external benchmark needed to determine the market value of transport and call-termination services. Admittedly, interconnection with wireless carriers is distinguishable from interconnection with incumbent LECs. For example, significant differences in utilization rates complicate direct comparisons, as does the emergence of wireless pricing schemes that fail to differentiate between local and long distance service. Furthermore, wireless carriers often interconnect indirectly through the LECs.⁴³⁸ Nevertheless, as wireless and other facilities-based competitors grow, the rates they charge others for interconnection will emerge as a market-based reference point for use in resolving most pricing problems. The number of external benchmarks will only grow as local cable operators and other broadband providers begin to offer local telephone service.

On a more fundamental level, the existence of platform competition raises serious questions about whether compelling access to local telephone networks represents sound economic policy. To the extent that substitute networks are available, it is not clear that the incumbent LEC's facilities act as a monopoly bottleneck.⁴³⁹ Even if compelled access were necessary, however, the emergence of alternative facilities capable of providing the same functions dramatically affects the manner in which such access should be priced. Simply put, com-

¶¶ 237–238 (1994). Instead, the FCC opted to seek further comment on the issue in a subsequent proceeding. *See* Equal Access & Interconnection Obligations Pertaining to Commercial Mobile Radio Services, Notice of Proposed Rule Making and Notice of Inquiry, 9 F.C.C.R. 5408, 5458–69 ¶¶ 121–143 (1994). In the interim, the FCC indicated that it would “entertain any requests [for] interconnection on a case-by-case basis.” *Id.* at 5458 n.213. When these proceedings also matured into a formal decision, the FCC again postponed ruling on the issue on the grounds that, although requiring wireless-to-wireless interconnection would appear to promote efficiency, such regulation was premature. *See* Interconnection & Resale Obligations Pertaining to Commercial Mobile Radio Services, Second Notice of Proposed Rulemaking, 10 F.C.C.R. 10666, 10681–82 ¶¶ 28–29 (1995). An association of equipment manufacturers brought suit to compel the FCC to act. *See* Telecomms. Resellers Ass’n v. FCC, 141 F.3d 1193 (D.C. Cir. 1998). Although the D.C. Circuit expressed dismay over the fact that five years had lapsed while the FCC continued to investigate the issue, the court nonetheless upheld the FCC’s decision to defer resolution of the issue. *See id.* at 1197. The FCC did not issue a final resolution until the *CMRS Interconnection Order* two years later. 15 F.C.C.R. at 13534 ¶ 28. For a brief overview of the early history of these somewhat protracted proceedings, see PETER W. HUBER ET AL., FEDERAL TELECOMMUNICATIONS LAW 953–55 (2d ed. 1999).

⁴³⁸ *CMRS Interconnection Order*, 15 F.C.C.R. at 13533–34 ¶¶ 26–27. Historically, the FCC further complicated such comparisons by awarding one of the two available first-generation cellular licenses to the incumbent LEC, which in turn raised questions whether interconnection agreements between wireless carriers actually represented arms-length transactions. The deployment of competitive wireless network on a national scale, the subsequent emergence of PCS, and the impending arrival of third-generation wireless devices should eliminate this problem in the near future.

⁴³⁹ *See* AT&T Corp. v. Iowa Utils. Bd., 525 U.S. 366, 389 (1999) (holding that the FCC must consider whether a network element is available from other sources before compelling access to that element under the 1996 Act).

parable transactions provide external benchmarks that should enable regulatory authorities to establish access rates that are more likely to promote efficiency.

In the absence of external benchmarks based on actual market transactions, a cost-based, second-best measure of market value is necessary. As noted earlier, economic theory suggests that cost-based measures should follow ECPR, which sets rates as the sum of the direct incremental costs of providing an input and the opportunity costs that the incumbent incurs when the new entrant provides the services instead of the incumbent.⁴⁴⁰ TELRIC includes elements designed to reflect the first of these two components.⁴⁴¹ The key problem with the FCC's analysis is its refusal to include any factor reflecting opportunity cost.⁴⁴² In setting prices without considering the value of foregone alternatives, TELRIC essentially ignores the insights of neoclassical economics by basing value solely on cost without taking any demand-side effects into consideration.

The FCC's reasons for declining to base access rates on ECPR do not withstand analysis. First, the FCC argued that the statutory requirement that prices be cost-based precluded consideration of opportunity cost.⁴⁴³ The Supreme Court, however, specifically rejected this reasoning, finding the term *cost* "too protean" to support any such plain-language argument.⁴⁴⁴ If anything, the economic truism that opportunity costs represent the true economic cost directly undercuts the FCC's argument.⁴⁴⁵ Indeed, the Court recognized as much when it cited "opportunity cost" as an example of a forward-looking "cost" that fell within the purview of the statute.⁴⁴⁶

The FCC's second basis for rejecting ECPR is equally unsound. The FCC asserted that because ECPR calculates opportunity cost on the basis of current retail prices, it locks in monopoly rents without providing a mechanism for moving prices towards competitive

⁴⁴⁰ See *supra* Part I.C.3. Professor Spulber has argued elsewhere that the rates charged for access to unbundled network elements should include an end-user charge that cannot be bypassed in order to compensate incumbent LECs for costs incurred due to the deregulatory innovations that caused investment-backed expectations to fail. See SIDAK & SPULBER, *supra* note 39, at 334–35. Extended discussion of these issues falls outside the scope of this Article. For the time being, it suffices that the argument advanced in this Article, while consistent with the imposition of such user charges, does not require it.

⁴⁴¹ See SIDAK & SPULBER, *supra* note 39, at 316–18.

⁴⁴² See *supra* note 413 and accompanying text.

⁴⁴³ See Implementation of the Local Competition Provisions of the Telecommunications Act of 1996, First Report and Order, 11 F.C.C.R. 15499, 15859 ¶ 709 (1996) ("*Local Competition Order*").

⁴⁴⁴ Verizon Communications, Inc. v. FCC, 535 U.S. 467, 500–01 (2002) (describing "cost" as "a chameleon" and as a "virtually meaningless term . . . [that] say[s] little about the method employed to determine a particular rate" (internal quotation marks omitted)).

⁴⁴⁵ See SIDAK & SPULBER, *supra* note 39, at 322–23, 404–10.

⁴⁴⁶ Verizon, 535 U.S. at 499 n.17.

levels.⁴⁴⁷ This argument suffers from two fundamental flaws. First, it ignores the fact that the competition will cause retail prices to drop and that, as this occurs, ECPR will dynamically readjust the opportunity-cost factor to reflect those price changes.⁴⁴⁸ Second, the existence of any monopoly rents in retail prices is more the result of failed rate regulation at the state level than of any theoretical flaw in ECPR.⁴⁴⁹ Although such a failure would justify improving state regulation of retail prices, it does not justify incurring the myriad problems that would result from distorting access prices.⁴⁵⁰

The Supreme Court upheld the FCC's rate-making methodology in *Verizon*,⁴⁵¹ but it did not specifically endorse TELRIC and reject ECPR as a matter of economic policy. On the contrary, the Court carefully eschewed expressing any opinion about the merits of any particular economic approach.⁴⁵² Instead, it applied the deferential standard of review that gives agencies a wide range of discretion in resolving statutory ambiguities, as long as their interpretation falls within a wide zone of reasonableness.⁴⁵³ Thus, the Court's decision does not necessarily foreclose the FCC from applying a rate-making approach based on market prices or ECPR.⁴⁵⁴

Indeed, because there are alternative technological platforms, it may no longer be sound economic policy to compel access to the elements of local telephone networks. As noted above,⁴⁵⁵ any market failures that exist are caused by the paucity of horizontal competition at the network level. The only viable long-term solution to this problem is to promote the deployment of alternative network capacity. UNE access requirements have the effect of destroying incentives to

⁴⁴⁷ *Local Competition Order*, 11 F.C.C.R. at 15859 ¶ 709; *see also* Expanded Interconnection with Local Telephone Co. Facilities, Report and Order and Notice of Proposed Rulemaking, 7 F.C.C.R. 7369, 7426 ¶ 123, 7430 ¶ 129 (1992) (“*Special Access Order*”) (rejecting the use of the “net revenue” test proposed by Alfred Kahn in setting interconnection rates in the FCC’s *Expanded Interconnection* proceeding).

⁴⁴⁸ *See* SIDA & SPULBER, *supra* note 39, at 352–53.

⁴⁴⁹ *See id.* at 353–54.

⁴⁵⁰ *See id.* at 351–58, 362–63.

⁴⁵¹ *See Verizon*, 535 U.S. at 497–522.

⁴⁵² *See id.* at 507 (“As a reviewing Court we are, of course, in no position to assess the precise economic significance of [various economic aspects of the incumbent LECs’ arguments]. Instead it is enough to recognize that the incumbents’ assumption may well be incorrect.”); *id.* at 523 (“We cannot say whether the passage of time will show competition prompted by TELRIC to be an illusion, but TELRIC appears to be a reasonable policy for now, and that is all that counts.”).

⁴⁵³ *See id.* at 501 (citing *Chevron U.S.A. Inc. v. Natural Res. Def. Council, Inc.*, 467 U.S. 837, 843–45 (1984)).

⁴⁵⁴ *See AT&T Corp. v. Iowa Utils. Bd.*, 525 U.S. 366, 426 (1999) (Breyer, J., concurring in part and dissenting in part) (noting that, in rejecting ECPR, the FCC “did not claim, nor did its reasoning support the claim, that the use of such a system would be arbitrary or unreasonable”).

⁴⁵⁵ *See supra* notes 28–29 and accompanying text.

invest in this alternative capacity and rescuing would-be purchasers of those services from having to make such investments. As a result, UNE access requirements tend to harm dynamic efficiency and to entrench incumbent carriers by depriving wireless carriers, cable telephony companies, and other alternative local phone-service providers of their natural strategic partners. Indeed, there is some evidence that policy makers may be coming around to this point of view. Media reports indicate that the FCC is becoming concerned that the UNE access is forestalling the emergence of facilities-based competition in local telephone service. As a result, it is considering whether to begin phasing out the UNE access requirements.⁴⁵⁶

3. *Constitutional Arguments in Favor of Market-Based Pricing*

The FCC's implementation of the 1996 Act was not only economically problematic; its adoption of a methodology focused solely on replacement cost raises serious constitutional problems as well. The takings implications of the interconnection and unbundled access provisions of the local competition provisions have largely escaped attention. Like most forms of rate regulation, TELRIC limits the prices that incumbent LECs can charge for the use of their network elements. Therefore, the courts and the FCC have suggested that the principles of confiscatory rate-making⁴⁵⁷ or regulatory takings⁴⁵⁸ are likely to govern.⁴⁵⁹

The problem with this analysis is that it focuses on TELRIC as a general matter without focusing on the constitutional implications of the 1996 Act's physical collocation provisions. As the FCC has itself recognized, both interconnection and access to unbundled network elements typically require the network owner to permit other carriers

⁴⁵⁶ See Yochi J. Dreazen & Shawn Young, *FCC Plans to Erase a Key Rule Aiding Local Phone Competition*, WALL ST. J., Jan. 6, 2003, at A1. The FCC took the first steps in this direction shortly before this Article went to press. See *supra* note 408.

⁴⁵⁷ See *Verizon*, 535 U.S. at 523–24; Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, First Report and Order (“*Local Competition Order*”), 11 F.C.C.R. 15499, 15871–72 ¶¶ 737–738 (1996). In another case, a court rejected a takings challenge because no taking would occur until a new entrant had actually purchased services under the interconnection agreement under dispute. See *US W. Communications, Inc. v. WorldCom Tech., Inc.*, 31 F. Supp. 2d 819, (D. Or. 1998). Although the court did not offer any hint of the type of takings analysis that would apply, an earlier decision in the same case appeared to embrace a confiscatory rate-making analysis. See *US W. Communications, Inc. v. MFS Intelenet, Inc.*, 35 F. Supp. 2d 1221, 1236 (D. Or. 1998) (indicating that the takings challenge would turn on whether the total effect of the rates established by the interconnection agreement is confiscatory).

⁴⁵⁸ See *Tex. Office of Pub. Util. Counsel v. FCC*, 183 F.3d 393, 429 n.59 (5th Cir. 1999); *Local Telephone Co. Facilities, Report and Order and Notice of Proposed Rulemaking*, 7 F.C.C.R. 7369, 7477–81 ¶¶ 235–237 (1992).

⁴⁵⁹ The notable exception is *Qwest Corp. v. United States*, 48 Fed. Cl. 672 (2001), discussed *infra* notes 465–72 and accompanying text.

to place equipment in its central office on an indefinite basis.⁴⁶⁰ The physical collocation required by interconnection and unbundled access provisions represents the type of permanent physical invasion that *Loretto* deemed a per se taking.⁴⁶¹ The D.C. Circuit reinforced this conclusion in *Bell Atlantic Telephone Cos. v. FCC*,⁴⁶² holding that the physical collocation regime upon which the FCC modeled its implementation of the 1996 Act constituted a physical taking. Similarly, *GTE Service Corp. v. FCC*,⁴⁶³ which overruled the FCC's *Collocation Order*, emphasized that the Commission's interpretation of the physical collocation provisions may result in "unnecessary takings" of LEC property.⁴⁶⁴

Most instructive is the decision in *Qwest Corp. v. United States*,⁴⁶⁵ one of the few cases to address the merits of a takings challenge to the 1996 Act. In that case, a requesting carrier obtained access to fourteen loops that served one customer, and connected them to its own switching equipment, located in a collocation cage in the incumbent LEC's central office.⁴⁶⁶ The incumbent LEC brought a takings challenge, arguing that it received constitutionally insufficient compensation.⁴⁶⁷ The incumbent circumscribed its argument by conceding that it was already receiving adequate compensation for the space occupied by the collocation cage. As a result, it restricted its takings claim to the loops leased by the new entrant.⁴⁶⁸

The court resolved the case by relying on the distinction between physical and nonpossessory takings. In particular, the court accepted the theory that "government-mandated co-location of one party's equipment on another party's premises constitutes a physical taking of the occupied space."⁴⁶⁹ As a result, the court acknowledged that the collocation cage "is analogous to the rooftop equipment in *Loretto*" and that it might have held that the restriction constituted a per se taking had the incumbent LEC focused on the collocation cage it-

⁴⁶⁰ See *supra* note 396–99 and accompanying text.

⁴⁶¹ See *supra* Part II.A.2. Even scholars who are skeptical of broader readings of *Loretto* accept that regulations that require physical collocation effect per se takings. See Leonard M. Baynes, *Swerving to Avoid the "Takings" and "Ultra Vires" Potholes on the Information Superhighway: Is the New York Collocations and Telecommunications Policy a Taking Under the New York Public Service Law?*, 18 HASTINGS COMM. & ENT. L.J. 51, 73–74 (1995); Chen, *supra* note 62, at 1551; Susan Rose-Ackerman & Jim Rossi, *Disentangling Deregulatory Takings*, 86 VA. L. REV. 1435, 1466–67 & n.115 (2000).

⁴⁶² 24 F.3d 1441, 1445 (D.C. Cir. 1994); see *supra* notes 381–82 and accompanying text.

⁴⁶³ 205 F.3d 416 (D.C. Cir. 2000).

⁴⁶⁴ *Id.* at 416, 421, 426

⁴⁶⁵ 48 Fed. Cl. 672 (2001).

⁴⁶⁶ See *id.* at 679–80.

⁴⁶⁷ See *id.* at 680.

⁴⁶⁸ See *id.* at 689–93.

⁴⁶⁹ *Id.* at 694.

self.⁴⁷⁰ When the new entrant leased loops, on the other hand, it did not require the incumbent LEC to submit to a permanent physical occupation, even if the LEC's use of its property was restricted. Therefore, the court concluded that the claim based on the loops did not constitute a physical taking.⁴⁷¹ The court once again emphasized that its holding that compelled access to the loops was not a physical taking is consistent with its prior conclusion that "the implementation of mandatory access provisions requiring a telecommunications provider or utility to make space available on its premises for a competitor to affix its own equipment . . . constitut[ed] a physical taking under *Loretto*."⁴⁷²

The FCC has attempted to reconcile these holdings by asserting that takings claims involving public utility property are governed by the more permissive principles embodied in the Supreme Court's confiscatory rate-making⁴⁷³ and regulatory takings⁴⁷⁴ precedents. The fundamental problem with this analysis is that it ignores the distinction between physical and nonpossessory takings made in *Loretto* and *Florida Power* and reaffirmed in *Tahoe-Sierra*.⁴⁷⁵ Because the 1996 Act's physical-collocation mandate unambiguously requires incumbent LECs to permit competing carriers to place equipment on their property, the Act constitutes a classic physical taking under *Loretto*. Therefore, unlike with confiscatory rate-making or regulatory takings jurisprudence, the regulation's economic impact and its public purpose are of no consequence.

It follows that the owners of local telephone networks are entitled to just compensation for the physical invasion that the 1996 Act mandates. As discussed above, to the extent that there are external markets for a particular input, the principles of just compensation require that the incumbent LECs receive the market value of the inputs that are physically taken.⁴⁷⁶ Although the past absence of direct competition in local telephony deprived regulators of any market-based benchmarks,⁴⁷⁷ cellular telephony and other forms of wireless communications have created an external basis for determining the value

⁴⁷⁰ *Id.* at 691.

⁴⁷¹ *Id.* at 691, 693.

⁴⁷² *Id.* at 693.

⁴⁷³ See Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, First Report and Order, 11 F.C.C.R. 15499, 15871-72 ¶¶ 737-738 (1996) ("*Local Competition Order*").

⁴⁷⁴ See Local Telephone Co. Facilities, Report and Order and Notice of Proposed Rulemaking, 7 F.C.C.R. 7369, 7479-81 ¶¶ 235-237 (1992).

⁴⁷⁵ See *supra* notes 233-35, 244, 276 and accompanying text.

⁴⁷⁶ See Part II.B.2.a.

⁴⁷⁷ See Leonard M. Baynes, *How Much Is the Toll to Access the Information Superhighway? An Analysis of the Appropriate Measure of Compensation for the Partial Taking of Public Utility Property*, 62 TENN. L. REV. 141, 149-50, 163-64 (1994).

of the local loop's services.⁴⁷⁸ Therefore, basing access prices on replacement cost conflicts with the Court's established takings jurisprudence. Perhaps sensing the weakness of its position, the FCC offered the alternative argument that, assuming that a taking had occurred, fair market value should not include monopoly rents.⁴⁷⁹ The legal support for this claim, however, is suspect.⁴⁸⁰ Even if the FCC's legal conclusion were sound, there is reason to doubt the factual premises underlying the argument. The emergence of direct facilities-based competition and the regulation of local telephone service rates suggest that the open market prices did not include monopoly rents.

Although we find it unavoidable to conclude that the 1996 Act's physical collocation requirements effect a physical taking, we recognize that virtual collocation poses a much closer question. The Supreme Court recognized this distinction in *Loretto*, observing that regulations requiring property owners to install certain types of network-related equipment might present a different question.⁴⁸¹ In such a case, the property owner would own the equipment and have full authority over its "placement, manner, use, and possibly [its] disposition."⁴⁸² In addition, the property owner would be able to decide how to comply with the applicable regulations and therefore "could minimize the physical, esthetic, and other effects of the installa-

⁴⁷⁸ See *supra* notes 437–38 and accompanying text.

⁴⁷⁹ *Local Competition Order*, 11 F.C.C.R. at 15872 ¶ 740; see also Baynes, *supra* note 477, at 173–76 (arguing that excluding monopoly rates would foster competition, meet the expectation of public utility investors, and provide constitutionally just compensation).

⁴⁸⁰ The FCC cites a single lower court decision as authority for the proposition that just compensation does not permit recovery of monopoly rents. See *Local Competition Order*, 11 F.C.C.R. at 15872 ¶ 740 (citing *Lord Mfg. Co. v. United States*, 84 F. Supp. 748 (Ct. Cl. 1949)). Furthermore, *Lord Mfg.* does not stand for the proposition for which the FCC cites it. In that case, a manufacturer of patented rubber and metal mountings critical for aircraft flight in adverse weather conditions had developed a dominant market position that allowed it to earn profits ranging from fifty-nine to one hundred forty-seven percent. See 84 F. Supp. at 748–49, 751. During World War II, the federal government ordered the manufacturer to sell its products to the government at prices the government deemed "fair and reasonable," allowing the manufacturer a profit of only ten and one-half percent. See *id.* at 749–50. The manufacturer challenged the action under the Takings Clause. See *id.* at 751–54. The court conceded that "[i]f these were ordinary times," the manufacturer would have been able to earn supercompetitive profits. *Id.* at 755. "[T]hese were not ordinary times," however, because the war had interfered with the free and untrammelled market necessary for a fair-market value determination. See *id.* at 755. Thus, the true holding of *Lord Mfg.* is that circumstances may exist in which current market price is no longer an appropriate indicator of fair market value. See also *BFP v. Resolution Trust Corp.*, 511 U.S. 531, 537–38 (1994) (discussing how forced sales can drive prices above or below fair-market value). *Lord Mfg.* does not stand for the proposition that monopoly profits are not properly considered part of fair-market value. On the contrary, the Court of Claims explicitly recognized that the opposite would hold true in the absence of wartime price controls. See also *City of Tucson v. El Rio Water Co.*, 415 P.2d 872, 875 (Ariz. 1966) (recognizing that monopoly profits are properly regarded as part of fair-market value).

⁴⁸¹ *Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 440 n.19 (1982).

⁴⁸² *Id.*

tion.⁴⁸³ The FCC followed this reasoning in its *Expanded Interconnection* proceeding, where it held that offering the LECs the option of virtual collocation eliminated any remaining constitutional infirmities.⁴⁸⁴

Unfortunately, the courts have never had the opportunity to address whether virtual collocation effects a physical taking. During the *Expanded Interconnection* proceeding, the 1996 Act's physical collocation provisions rendered the virtual collocation provisions moot.⁴⁸⁵ The Act further obviated the need to resolve whether a bare virtual collocation requirement constitutes a physical taking, because in most circumstances section 251(c)(6) clearly gives requesting carriers the right to physically collocate their equipment.⁴⁸⁶ As a result, the Act is directly analogous to the type of regime that *Loretto*, *Qwest*, and *Bell Atlantic* found to constitute a physical taking.

That said, language in *Bell Atlantic* suggests that virtual collocation poses the same takings concerns as physical collocation in that both allow CAPs to physically connect their networks to the LECs' networks.⁴⁸⁷ This interconnection requirement is enough to constitute a physical taking, regardless of who owns the property on which the interconnection occurs.⁴⁸⁸ Indeed, a subsequent court drew largely the same conclusion in holding that it constituted a physical taking to require that an incumbent LEC accommodate a competitor by reconfiguring the wires with which it provided telephone service to a multi-building complex.⁴⁸⁹ The court did not consider it important that the apartment complex owner—and not the LEC—owned the land on which the regulation obligated the LEC to extend its wires.⁴⁹⁰

B. Access to Networks of Utility Poles

The analysis we have developed helps illuminate the economic and constitutional considerations underlying a second emerging policy problem: compelled access to networks of utility poles. This subpart describes the FCC regulations requiring such access and applies

⁴⁸³ *Id.*; see also *GTE Serv. Corp. v. FCC*, 205 F.3d 416, 419 (D.C. Cir. 2000) ("Virtual collocation therefore minimizes the takings problem, because competitors do not have physical access to a LEC's property.").

⁴⁸⁴ See *supra* note 384 and accompanying text; see also Baynes, *supra* note 461, at 74–75 ("[P]hysical 'invasions' of utility equipment through pipes, wires, or cables deal with the manner in which the landowner can use property; this invasion is considerably less burdensome than a traditional physical invasion.").

⁴⁸⁵ See *supra* note 386 and accompanying text.

⁴⁸⁶ See *supra* note 399 and accompanying text.

⁴⁸⁷ See *Bell Atl. Tel. Co. v. FCC*, 24 F.3d 1441, 1446 (D.C. Cir. 1994).

⁴⁸⁸ *Id.*

⁴⁸⁹ See *GTE Southwest Inc. v. Pub. Util. Comm'n*, 10 S.W.3d 7, 10–11 (Tex. Ct. App. 2000).

⁴⁹⁰ See *id.*

the analytical framework that we have developed to evaluate the regulations from an economic and constitutional standpoint. As was the case in the first policy problem we addressed,⁴⁹¹ we conclude that the manner in which the government has compelled access to networks of utility poles conflicts with basic economic theory as well as with the Supreme Court's takings jurisprudence. Thus, we argue that the current pricing regime should be replaced by an approach that bases access rates on market prices.

1. *Regulatory Framework*

In much of the country, cable television systems depend upon networks of utility poles to establish the wireline connections to individual homes and businesses. Congress, aware of this fact, became concerned that the electric and telephone companies who owned the poles were charging monopoly prices that tended to retard cable's deployment.⁴⁹² As a result, it enacted the Pole Attachments Act of 1978,⁴⁹³ which gave the FCC the power to regulate the rates that utilities could charge cable television systems for pole attachments in any state that did not already regulate such agreements.⁴⁹⁴ As originally enacted, the Pole Attachments Act required that the rates, terms, and conditions for pole attachment be just and reasonable⁴⁹⁵ and established methodologies for determining the minimum and maximum rates that could be charged.⁴⁹⁶ As implemented by the FCC, the "Cable Formula" allowed the pole owner to recover approximately 7.4 percent of the total costs of the pole from each attaching entity.⁴⁹⁷ As

⁴⁹¹ See *supra* Part III.A.

⁴⁹² See *Nat'l Cable & Telecomms. Ass'n v. Gulf Power Co.*, 534 U.S. 327, 330–31 (2002); *supra* notes 238–41 and accompanying text.

⁴⁹³ Pub. L. No. 95-234, 92 Stat. 33 (codified as amended at 47 U.S.C. § 224 (2000)).

⁴⁹⁴ See 47 U.S.C. § 224(b)(1). Eighteen states and the District of Columbia impose such regulation. Application by Verizon New England, Inc., for Authorization to Provide In-Region, InterLATA Services in Vermont, Memorandum Opinion and Order, 17 F.C.C.R. 7625, 7957 ¶ 47 (2002) (citing States that Have Certified that They Regulate Pole Attachments, Public Notice, 7 F.C.C.R. 1498 (1992)).

⁴⁹⁵ 47 U.S.C. § 224(b)(1).

⁴⁹⁶ The statute required that at a minimum the rates established by the FCC allow the utilities to recover "the additional costs of providing pole attachments." *Id.* § 224(d)(1). The maximum rate was set "by multiplying the percentage of the total usable space [occupied by the attachment] by the sum of the operating expenses and actual capital costs [attributable to the pole]." *Id.* The resulting formula is:

$$\text{Maximum Rate} = \frac{\text{Space Occupied}}{\text{Total Usable Space}} \times \text{Net Cost of a Bare Pole} \times \text{Carrying Charge Rate}$$

Amendments of Commission's Rules & Policies Governing Pole Attachments, Consolidated Partial Order on Reconsideration, 16 F.C.C.R. 12103, 12131 ¶ 53 (2001) ("*Consol. Reconsideration Order*").

⁴⁹⁷ The FCC established standard presumptions that the total amount of usable space is limited to thirteen and one-half feet and that each attaching entity occupies one foot of usable space. See 47 C.F.R. §§ 1.1404(g)(1)(xi), 1.1402(c) (2001). As a result, the pole owner could recover 1/13.5 of the total cost of the pole from each attaching entity, an

discussed above, the Supreme Court held in *Florida Power* that the statute as originally enacted did not constitute a per se taking under *Loretto*.⁴⁹⁸ Because the Act did not require that any utility enter into a pole attachment agreement, it represented nothing more than a form of rate regulation, which violated the Takings Clause only if confiscatory.⁴⁹⁹

The Telecommunications Act of 1996, however, modified the Pole Attachments Act. As the Court noted in *National Cable & Telecommunications Ass'n v. Gulf Power Co.*,⁵⁰⁰ one of the key changes was to broaden the scope of the regulatory scheme, which now covered telecommunications carriers as well as cable television systems.⁵⁰¹ In addition, two other features of the 1996 amendments merit extended discussion. First, the amendments made access to poles compulsory rather than voluntary.⁵⁰² Second, the amendments established a new pricing mechanism to govern attachments by telecommunications carriers that differed from that governing attachments by cable television systems.⁵⁰³

a. *The Shift to Compulsory Access*

For the purposes of this Article, the most important feature of the 1996 amendments is the transformation of Pole Attachments Act into a compulsory access provision. Prior to the 1996 amendments, when deciding whether to treat the Pole Attachments Act as a per se taking under *Loretto*, the Supreme Court gave substantial weight to the fact that the Act did not compel any utility to allow any other entity access to its network of utility poles.⁵⁰⁴ Although the Court explicitly declined to address what would follow if the statute compelled access to utility poles, its reasoning strongly suggested that such a change would bring the Pole Attachments Act within the ambit of its physical takings jurisprudence.⁵⁰⁵

The Eleventh Circuit followed *Florida Power* to its logical conclusion when it held in *Gulf Power Co. v. United States (Gulf Power I)*⁵⁰⁶ that

amount approximately equal to 7.4 percent. *See Consol. Reconsideration Order*, 16 F.C.C.R. at 12129 ¶ 48.

⁴⁹⁸ *See supra* notes 242–44 and accompanying text.

⁴⁹⁹ *See supra* notes 245–46 and accompanying text.

⁵⁰⁰ 534 U.S. 327 (2002).

⁵⁰¹ 47 U.S.C. § 224(e) (2000); *see also id.* § 224(a)(4) (defining “pole attachment” to include attachments by telecommunications providers).

⁵⁰² *Id.* § 224(f)(1). The statute created exceptions for situations in which there is insufficient capacity or when refusal to provide access is justified by safety, reliability, or other engineering concerns. *Id.* § 224(f)(2).

⁵⁰³ *Compare id.* § 224(e), *with id.* § 224(d)(3).

⁵⁰⁴ *See supra* notes 242–44 and accompanying text.

⁵⁰⁵ *See supra* notes 247–49 and accompanying text.

⁵⁰⁶ 187 F.3d 1324, 1328–29 (11th Cir. 1999).

the 1996 amendments turned the Pole Attachments Act into a per se taking under *Loretto*. Reaffirming the distinction between physical and nonpossessory takings, the Eleventh Circuit held that the Court's confiscatory rate-making jurisprudence did not apply to cases involving the permanent physical occupation of property.⁵⁰⁷ Although the *Gulf Power I* court found that a taking had occurred, it held that the logically subsequent question—whether the statute provided for just compensation—was not yet ripe for judicial resolution.⁵⁰⁸ The following year, in *Gulf Power Co. v. FCC (Gulf Power II)*⁵⁰⁹ and *Alabama Power Co. v. FCC*,⁵¹⁰ the Eleventh Circuit reaffirmed these conclusions. Although the Supreme Court later vacated *Gulf Power II*,⁵¹¹ its action did not weaken the precedential effect of *Alabama Power* or *Gulf Power I*. In addition, the Court did not question the propriety of the Eleventh Circuit's resolution of the takings issues.

b. *The Compensation Regime*

The 1996 amendments also supplied a different basis for compensating telecommunications carriers than the one for cable television systems.⁵¹² This new basis is commonly known as the “Telecom Formula.”⁵¹³ Although the details of the various formulas are complicated,⁵¹⁴ for our purposes it suffices to point out a few key differences. In contrast to the Cable Formula, which established uniform rates of

⁵⁰⁷ *Id.*

⁵⁰⁸ *Id.* at 1338. In so holding, however, the court did express some skepticism about whether it would ultimately be persuaded by the utility's takings argument. *See id.* This dictum should carry little weight, because it attempted to employ the Court's confiscatory rate-making precedent to dispose of a case involving a physical taking.

⁵⁰⁹ *Gulf Power Co. v. FCC*, 208 F.3d 1263, 1272–73 (11th Cir. 2000), *rev'd on other grounds sub nom.* Nat'l Cable & Telecomms. Ass'n v. *Gulf Power Co.*, 534 U.S. 327 (2002).

⁵¹⁰ 311 F.3d 1357, 1367–68 (11th Cir. 2002).

⁵¹¹ *See Nat'l Cable & Telecomms. Ass'n*, 534 U.S. at 327.

⁵¹² *See* 47 U.S.C. § 224(e) (2000). The separate scheme governing telecommunications carriers became effective after February 8, 2001, after which point the Telecom Formula began to be phased in over a period of five years.

⁵¹³ *See* Amendment of Rules and Policies Governing Pole Attachments, Report and Order, 15 F.C.C.R. 6453, 6457–58 ¶ 5 (2000) (“*Fee Order*”). Prior to the adoption of the new formula, the Cable Formula governed pole attachments by telecommunications carriers.

⁵¹⁴ Although rates associated with usable portions of the pole follow the approach of the Cable Formula and allocate costs in accordance with the percentage of usable space occupied, *see* 47 U.S.C. § 224(e)(3), recovery rates associated with the unusable portion of the pole are allocated in accordance with the number of attaching entities, *see id.* § 224(e)(2). Specifically, one-third of the cost of the unusable space is borne by the pole owner, with the remaining two-thirds divided among all attaching entities (including the pole owner). *See id.* § 224(e)(3); Implementation of Section 703(e) of Telecommunications Act of 1996, Report and Order, 13 F.C.C.R. 6777, 6799–6800 ¶ 43 (1998) (“*Telecom Order*”). The FCC originally established two different formulas to calculate each part separately. For simplicity, they eventually combined the calculation into a single formula. The combined formula is written as follows:

compensation for all portions of the pole, the Telecom Formula allowed for different rates of recovery for the “usable” and “unusable” portions of the pole. As a result, the Cable Formula and the Telecom Formula can lead to significant differences in compensation.⁵¹⁵

FIGURE 2: COMPARISON OF RECOVERY RATES UNDER THE POLE ATTACHMENTS ACT

Number of Attaching Entities	Percentage of Pole Costs Recoverable	
	Cable Formula	Telecom Formula
1	7.4%	24.0%
2	14.8%	33.8%
3	22.2%	40.0%
4	29.6%	44.8%
5	37.0%	48.9%
6	44.4%	52.6%
7	51.9%	56.0%
8	59.3%	59.3%

It is also noteworthy that both the Cable and the Telecom Formulas are based on historical cost rather than forward-looking cost.⁵¹⁶

$$\left| \begin{array}{l} \text{Maximum} \\ \text{Rate} \end{array} \right| = \left[\frac{\text{Space Occupied} \times \left(\frac{2}{3} \frac{\text{Unusable Space}}{\text{No. of Attaching Entities}} \right)}{\text{Pole Height}} \right] \times \text{Net Cost of a Bare Pole} \times \left| \begin{array}{l} \text{Carrying} \\ \text{Charge} \\ \text{Rate} \end{array} \right|$$

Amendments of Commission’s Rules and Policies Governing Pole Attachments, Consolidated Partial Order on Reconsideration, 16 F.C.C.R. 12103, 12131–32 ¶ 55 (2001) (“*Consol. Reconsideration Order*”). If the standard presumptions are applied, the formula is further simplified as follows:

$$\left| \begin{array}{l} \text{Maximum} \\ \text{Rate} \end{array} \right| = \left[\frac{\text{Space Occupied} \times \left(\frac{2}{3} \frac{\text{Unusable Space}}{\text{No. of Attaching Entities}} \right)}{\text{Pole Height}} \right] \times \text{Net Cost of a Bare Pole} \times \left| \begin{array}{l} \text{Carrying} \\ \text{Charge} \\ \text{Rate} \end{array} \right|$$

Id. at 12132 ¶ 56. The FCC subsequently established a rebuttable presumption that the average number of attaching entities in non-urbanized areas was three, and that the average number of attachers in an urbanized area was five. *Id.* at 12139–40 ¶¶ 71–72.

⁵¹⁵ Because the Telecom Formula allows for more generous rates for unusable space, it in effect allows for greater recovery than the Cable Formula for any reasonable number of attaching entities. For example, Alabama Power has asserted in litigation that, although application of the Cable Formula leads to an annual compensation rate of \$6.30 per pole, application of the Telecom Formula would result in an annual compensation rate of \$20.41 per pole. Brief of Alabama Power Company and Gulf Power Company at 23, *Ala. Power Co. v. FCC*, 311 F.3d 1357 (11th Cir. 2002).

⁵¹⁶ *Consol. Reconsideration Order*, 16 F.C.C.R. at 1249 ¶ 17, 12116–17 ¶¶ 21–22; *Fee Order*, 15 F.C.C.R. at 6460–61 ¶¶ 9–10.

The FCC orders implementing the 1996 amendments reasoned that that the Supreme Court upheld the use of such an approach in *Florida Power*.⁵¹⁷ The FCC further argued that the policies underlying the Pole Attachments Act, the static nature of the technology underlying utility poles, and the impossibility of duplicating utility pole networks justified adopting a methodology that was less focused on stimulating competitive entry.⁵¹⁸ In addition, the FCC emphasized the administrative convenience of maintaining the previous regime.⁵¹⁹

The FCC's cost-based orientation is further reflected by the position it adopted with respect to "overlashing," which refers to the practice by which an additional telecommunications or cable provider attaches a wire to one already attached to the pole. The FCC reversed its initial decision⁵²⁰ and instead ruled that an overlasher should not be counted as a separate attaching entity when determining the compensation paid to pole owners.⁵²¹ It based these decisions largely on cost-oriented considerations, reasoning that because "overlashing shares [space] with the host attachment," "no additional usable space [would be] occupied."⁵²² Consequently, the regulations require overlashers to pay compensation to pole owners only if their overlashing requires the owners to incur direct costs to increase the height or strength of their poles.⁵²³ The D.C. Circuit subsequently sustained the overlashing rules.⁵²⁴

The FCC declined to decide whether basing its methodology on historical costs violated the Takings Clause, stating that such as-applied takings challenges were not ripe until the methodology was embodied in a specific rate order. Until then, the only challenge that could be raised was a facial challenge. The FCC rejected the facial challenge, however, because it could not conclude that the historical rate methodology would deny just compensation in all cases.⁵²⁵

⁵¹⁷ *Consol. Reconsideration Order*, 16 F.C.C.R. at 12117 ¶ 22; *Fee Order*, 15 F.C.C.R. at 6460 ¶ 9.

⁵¹⁸ *Consol. Reconsideration Order*, 16 F.C.C.R. at 12116–17 ¶¶ 20–21, 12118 ¶ 24.

⁵¹⁹ *Id.* at 12116–17 ¶¶ 20–22, 12119 ¶ 25; *Fee Order*, 15 F.C.C.R. at 6460–61 ¶ 9.

⁵²⁰ Implementation of Section 703(e) of the Telecommunications Act of 1996, Report and Order, 13 F.C.C.R. 6777, 6809–10 ¶ 69 (1998) ("*Telecom Order*").

⁵²¹ *Consol. Reconsideration Order*, 16 F.C.C.R. at 12145 ¶ 83.

⁵²² *Id.* at 12142 ¶ 76; *see also id.* at 12143 ¶ 78 (justifying the failure to require additional compensation on the ground that "[o]verlashing does not increase the amount of space actually occupied by the attachment.").

⁵²³ *Id.* at 12142–43 ¶¶ 77–78.

⁵²⁴ *Southern Co. Servs. v. FCC*, 313 F.3d 574, 582 (D.C. Cir. 2002).

⁵²⁵ *See Consol. Reconsideration Order*, 16 F.C.C.R. at 12115–16 ¶ 18; Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, First Report and Order, 11 F.C.C.R. 15499, 16087–88 ¶ 1192 (1996) ("*Local Competition Order*").

The FCC reiterated these principles when deciding *Alabama Cable Telecommunications Ass'n v. Alabama Power Co.*⁵²⁶ Because this case arose out of an actual rate order, the FCC addressed the takings issue directly. Citing *Florida Power*, the FCC ruled that the constitutionality of its actions turned solely on whether the established rates were confiscatory. Even assuming that the 1996 amendments constituted a taking for which just compensation must be paid, the FCC found it impossible to apply any of the three conventional methodologies for determining fair market value.⁵²⁷ The FCC invoked the same rationale in rejecting similar arguments raised in its *Georgia Power* proceedings.⁵²⁸

The Eleventh Circuit subsequently upheld *Alabama Power Co.*, but on substantially different grounds. As it did in *Gulf Power I* and *II*, the court rejected the FCC's attempt to invoke the Supreme Court's confiscatory rate-making jurisprudence, holding that such precedent does not apply to cases involving compelled access.⁵²⁹ Instead, the court ruled that the case was governed by the Supreme Court's physical takings decisions, which require that pole owners who are forced to submit to permanent physical invasions receive fair market value, which in turn includes compensation for their opportunity costs.⁵³⁰ The court nonetheless sustained the FCC's decision not to include opportunity-cost compensation on the ground that one party's use of the poles generally did not preclude use by another party.⁵³¹ So long as there is excess pole capacity, the grant of a right of access to that pole does not foreclose the opportunity to sell the space to another bidding firm. In other words, access rates need not include compensation for opportunity costs unless the network is at full capacity and the pole owner can demonstrate that it had a higher-valued use for that capacity. Accordingly, the court in *Alabama Power* concluded that the

⁵²⁶ See *Ala. Cable Telecomms. Ass'n v. Ala. Power Co.*, Order, 16 F.C.C.R. 12209 (2001) (“[T]he Commission’s rules implementing the Pole Attachment Act, including the Commission’s formula for calculating just and reasonable pole attachment rates, satisfy the constitutional requirement of just compensation for the taking of property under the Fifth Amendment.”), *aff’d sub nom.* *Ala. Power Co. v. FCC*, 311 F.3d 1357 (11th Cir. 2002).

⁵²⁷ *Ala. Cable*, 16 F.C.C.R. at 12229–35 ¶¶ 46–57.

⁵²⁸ See *Teleport Communications Atlanta, Inc. v. Ga. Power Co.*, Order, 16 F.C.C.R. 20238, 20240–41 ¶ 7 (2001) (following the rule of *Alabama Cable*). The FCC subsequently ordered that a series of complaints against Georgia Power be held in abeyance pending attempts to negotiate a mutually acceptable rate using the information provided by the FCC’s opinion in *Teleport Communications*. See *City of Dublin v. Ga. Power Co.*, Order Granting Temporary Stay, 16 F.C.C.R. 20421 (2001); *City of Sanderville v. Ga. Power Co.*, Order Granting Temporary Stay, 16 F.C.C.R. 20417 (2001); *Knology, Inc. v. Ga. Power Co.*, Order Granting Temporary Stay, 16 F.C.C.R. 20413 (2001).

⁵²⁹ *Ala. Power*, 311 F.3d at 1367–68. For an earlier discussion of the Eleventh Circuit’s decision in *Alabama Power*, see *supra* notes 82–89 and accompanying text.

⁵³⁰ 311 F.3d at 1368–69.

⁵³¹ *Id.* at 1369–70.

opportunity costs of allowing another party to access the plaintiff's network were zero.⁵³² A similar appeal filed in *Georgia Power* is still pending before the Eleventh Circuit.⁵³³

2. *Economic Arguments in Favor of Market-Based Pricing*

Basic economic theory indicates that the most efficient way to implement the Pole Attachments Act would be to base access rates on market prices. This promotes allocative efficiency by providing those who obtain access with the signals they need in order to purchase the optimal quantity and overall mix of inputs. Market-based pricing also helps inputs find their way to those buyers who obtain the greatest benefit from them. Finally, market-based pricing promotes dynamic efficiency by providing the appropriate incentives for investment and innovation.

Basing access rates on the price that would be paid for access on the open market thus typically represents the best way to promote economic efficiency. Although arguably such external benchmarks once did not exist,⁵³⁴ the emergence of platform competition and the shift from rate regulation to access regulation have made it possible for regulatory authorities to infer market prices from two different types of transactions. First, regulators can consider the revenue earned from other attaching entities. Second, they can infer market value from the price of any substitute technologies available to attaching entities.

a. *Unregulated Pole Attachments*

The years since the enactment of the Pole Attachments Act have witnessed periods in which the rates for certain types of pole attachments were determined through arms-length transactions. For example, the Pole Attachments Act as originally enacted only extended to cable television systems. It was not until 1996 that it was extended to cover telecommunications carriers as well.⁵³⁵ As a result, there was no federal regulation of pole attachment agreements negotiated by local telephone companies seeking access to electrical companies' utility poles prior to 1996. Such agreements were necessarily quite common because electric companies owned the vast majority of utility poles.⁵³⁶ Thus, regulatory authorities can use the terms of market-based transactions—pole attachment agreements between telephone companies

⁵³² *Id.* at 1370–71.

⁵³³ Ga. Power Co. v. FCC, No. 02-10222-B (11th Cir. filed Jan. 11, 2002).

⁵³⁴ See Baynes, *supra* note 461, at 177.

⁵³⁵ See *supra* notes 238–41, 394–95 and accompanying text.

⁵³⁶ See James R. Dukart, *The Fight for Power Poles*, UTIL. BUS., Feb. 1, 2002, tbl. (reporting that local telephone companies own only 3% of all utility poles), available at http://www.utilitybusiness.com/ar/power_fight_power_poles/index.htm.

and utilities—to establish efficient pricing. FCC proceedings suggest that these rates were substantially higher than those authorized under the Pole Attachments Act.⁵³⁷

In addition, it is possible that some arms-length transactions were negotiated during the regulatory gaps that followed judicial challenges to the Pole Attachments Act. For example, in the aftermath of *Gulf Power I*, the FCC's uncertainty as to the constitutionality of the Cable and Telecom Formulas led the Commission to issue statements that seemed to indicate that it would not require that pole attachment rates comply with the formulas until after the courts had determined what constituted just compensation.⁵³⁸ Until the FCC explicitly disavowed this position,⁵³⁹ the parties negotiating pole attachment agreements may well have believed that such agreements were temporarily unregulated and, therefore, may have negotiated arms-length transactions during this time.⁵⁴⁰

b. *Alternative Network Technologies*

Regulatory authorities may also infer market prices from the rates charged for access to alternative technologies that provide the same functions as utility pole networks. According to basic economic theory, the prices for substitutes for a particular good represent useful proxies for determining the market value of that good.

i. *Wireless Carriers*

Of all the types of attachments likely to be attached to utility poles, attachments by wireless carriers are likely to face the most com-

⁵³⁷ Compare *Ala. Cable Telecomms. Ass'n v. Ala. Power Co.*, Order, 16 F.C.C.R. 12209, 12224 ¶ 35 (2001) (reporting that joint-use agreements between local telephone companies and electric companies reveal rates ranging between \$26.29–\$30.30 per pole), *aff'd sub nom.* *Ala. Power Co. v. FCC*, 311 F.3d 1357 (11th Cir. 2002), with *supra* note 515 (indicating that the Cable Formula and the Telecom Formula allowed for rates of \$6.30 and \$20.41, respectively).

⁵³⁸ See *Ala. Cable*, 16 F.C.C.R. at 12219 ¶ 23.

⁵³⁹ See *id.* at 12221–23 ¶¶ 29–31.

⁵⁴⁰ The Eleventh Circuit's decision in *Gulf Power II*, holding that the Pole Attachments Act did not cover Internet services, could also have created a window during which broadband providers and pole owners negotiated arms-length transactions. Apparently, the Eleventh Circuit immediately stayed the mandate of *Gulf Power II* pending Supreme Court review. See *Teleport Communications Atlanta, Inc. v. Ga. Power Co.*, Order, 16 F.C.C.R. 20238, 20241–42 ¶ 9 (2001); *Ala. Cable*, 16 F.C.C.R. at 12214–15 ¶¶ 11–12. Interestingly, the fact that such market benchmarks are no longer available underscores the extent to which the absence of a well-established market is the direct result of state and federal regulation. For a discussion of the problems associated with allowing other features of a regulatory regime to render a particular restriction constitutional, see Yoo, *Rise and Demise*, *supra* note 37, at 29–52. The absence of a market, however, does not imply that a product or service lacks market value. Rather, it means only that because of regulatory intervention, the value must be determined through some method other than by reference to market prices.

petition, because wireless carriers have the option of attaching their equipment to a wide variety of alternative facilities. Skyscrapers, communications towers, and any other sufficiently tall location can serve as a direct substitute for a utility pole. As a result, the Supreme Court has questioned whether attachments by wireless carriers truly fall within the economic rationale of the Pole Attachments Act, which is directed towards preventing monopoly pricing in bottleneck facilities.⁵⁴¹ Furthermore, the rates charged by these alternative attachment sites can provide an external benchmark for rate setting in the event that policy makers decide to impose such access requirements. The rental rates property owners charge wireless companies for space on their communications towers appear to exceed the rates allowed by the Pole Attachments Act by several hundred percent.⁵⁴² Therefore, there is reason to question whether the cost-based rates currently in place effectively promote allocative and dynamic efficiency.

ii. *Multichannel Video Programming Distributors (MVPDs)*

Providers of multichannel television service (dubbed “multichannel video programming distributors” (MVPDs) under federal law) have begun to utilize an ever broadening array of alternatives to conventional utility pole networks when delivering television programming to individual homes. In many cases, cable operators find it economically attractive to bypass utility poles altogether and instead install below-ground fiber networks of their own.⁵⁴³

In addition, the emergence of digital broadcast satellite (DBS) systems as a viable competitor to cable television provides another basis for estimating the value of cable television access to utility pole networks.⁵⁴⁴ DBS penetration is approaching levels that, under cur-

⁵⁴¹ See *Nat'l Cable & Telecomms. Ass'n v. Gulf Power Co.*, 534 U.S. 327, 341 (2002). The Court nonetheless held that the plain language of the statute included wireless carriers within its scope. Even if the text contained some ambiguity, the Court would defer to the FCC's construction of the statute. *Id.*

⁵⁴² Compare Fryer's TowerSource, The TowerSource/Tower Summit Survey, at <http://www.towersource.com/survey.html> (last visited May 16, 2002) (reporting that communications towers receive an average annual rent of over \$12,000 from each attaching entity); and Reply Brief of Ala. Power Co. & Gulf Power Co. at 14, *Ala. Power Co. v. FCC*, 311 F.2d 1357 (11th Cir. 2002) (reporting that Comcast charges between \$18,000 and \$21,600, annually, for wireless attachments to cellular communications towers), with *supra* note 515 (noting that the Telecom Formula allowed Alabama Power to charge wireless companies \$20.41 per year to attach to its poles)

⁵⁴³ See, e.g., Michael Grebb, *Cable's Big Worry: Getting Poleaxed*, MULTICHANNEL NEWS, June 4, 2001, at 100 (noting that Time Warner Cable “just decided to go underground” when confronted with higher pole attachment rates sought by an unregulated rural cooperative); see also Kathy Brister, *Cable Firms Battling Pole Fees*, ATLANTA J.-CONST., Feb. 28, 2001, at D9 (indicating that the cable industry would consider digging trenches “if the FCC does not keep rate control” on utility pole fees).

⁵⁴⁴ DBS is the most recent of a series of spectrum-based MVPD technologies. Other technologies include multipoint distribution services (MDS), which employ microwave

rent law, represent competition sufficient to justify eliminating rate regulation of basic cable services.⁵⁴⁵ Recent empirical studies have confirmed that consumers are beginning to regard DBS as a substitute for cable.⁵⁴⁶

Rates for DBS transmission service can thus provide an external benchmark for use in determining the market value of access to networks of public utility poles. There are, however, a number of factors that complicate a direct comparison. First, the geographic structure of the two media is, of course, quite different. By its nature, DBS is necessarily national in scope, while cable television service is necessarily limited to specific localities. In addition, the services differ in terms of quality. For example, DBS is more susceptible to weather-related interference than is cable. Finally, because there are presently only two national DBS providers⁵⁴⁷ thus giving most consumers only three MVPD options—MVPD competition may prove too thin to justify using market-based indicia to approximate efficient pricing. For the most part, though, this substitute technology provides useful guidance as to the value of the services being provided under a compelled access regime.

iii. *Broadband Providers*

Broadband providers are similarly benefiting from an increasingly wide array of alternative technologies that allow them to reach

transmission facilities to provide multichannel programming; satellite master antenna television systems (SMATV), which establish private cable systems that service individual apartment buildings; home satellite dishes (HSD), comprised of C-band satellite dishes; and various forms of Internet video. To date, none of these other technologies has proved particularly successful. See Annual Assessment of Status of Competition in Market for Delivery of Video Programming, Ninth Annual Report, FCC 02-338, at 36-40 ¶¶ 71-78, 43-52 ¶¶ 88-111 (2002), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-02-338A1.pdf [hereinafter *Ninth Annual Report on Video Programming Delivery*].

⁵⁴⁵ See Yoo, *supra* note 11, at 228-30.

⁵⁴⁶ See Implementation of Section 3 of the Cable Television Consumer Protection and Competition Act of 1992, Report on Cable Industry Prices, 16 F.C.C.R. 4346, 4363 ¶ 48, 4364-65 ¶ 53 (2001).

⁵⁴⁷ There are currently three DBS companies providing service: DirecTV, EchoStar (marketed as the DISH Network), and Dominion Video Satellite, Inc. (marketed as Sky Angel). Of these, only DirecTV and EchoStar have established positions in the national market for television programming of general interest. Dominion's Sky Angel operates through transponders located on an EchoStar satellite and is a self-described Christian and family-oriented DBS service. Its subscribership lags significantly behind that of DirecTV and EchoStar. See *Ninth Annual Report on Video Programming Delivery*, *supra* note 544, at 27-28 ¶ 53, 30 ¶ 59. Ironically, the relative paucity of DBS providers may itself be the direct result of the regulatory requirements requiring DBS providers who wish to carry programming provided by the major broadcast networks to carry all local television stations. Because the footprint of every DBS channel is national in scope, this requirement in effect forces DBS to devote precious channel capacity to redundant programming that can be transmitted to only a small portion of the country. See Yoo, *Rethinking Free, Local Television*, *supra* note 37, at 37-39.

consumers without using pole attachments.⁵⁴⁸ Although cable modem and digital subscriber line (DSL) providers have taken the early lead in the broadband race, there are a number of alternative broadband technologies in various stages of deployment.⁵⁴⁹ As noted earlier, a number of wireline telecommunications carriers have been aggressively building extensive subterranean fiber-optic networks that effectively bypass utility pole networks.⁵⁵⁰ In addition, DBS providers already offer satellite-based broadband technologies that are beginning to compete directly with wireline broadband services.⁵⁵¹ Although the differences between DBS and cable operators make direct comparisons difficult, these substitute technologies are still useful in determining the value of the services being provided through utility pole networks.

Other providers are deploying spectrum-based technologies whose geographic footprints are similar to those of cable operators. For example, PCS providers deliver mobile wireless broadband services, and other companies are preparing to use multipoint distribution service (MDS) to provide fixed wireless broadband services.⁵⁵² Digital television broadcasters are considering proposals to use part of the increased efficiency provided by digital transmission to expand into broadband services.⁵⁵³ Finally, the promise of third generation wireless devices (3G) hangs over the entire competitive arena.⁵⁵⁴ Each of these technologies provides network transmission services on a geographic scale that is much more comparable to utility poles than is DBS.

⁵⁴⁸ See generally *Appropriate Framework for Broadband Access to Internet over Wireline Facilities*, Notice of Proposed Rulemaking, 17 F.C.C.R. 3019, 3037–38 ¶¶ 36–37 (2002) (describing broadband technology and its effect on data processing); Yoo, *supra* note 11, at 253–58 (same).

⁵⁴⁹ *Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996*, Third Report, 17 F.C.C.R. 2844, 2864 ¶ 44, 2865 ¶ 48 (2002) (“*Third § 706 Report*”).

⁵⁵⁰ See *supra* note 429 and accompanying text.

⁵⁵¹ *Third § 706 Report*, 17 F.C.C.R. at 2869 ¶ 60, 2879–80 ¶ 85, app. B at 2926–27 ¶¶ 45–49.

⁵⁵² See *id.* at 2867–69 ¶¶ 55–59, 2901 ¶ 146, app. B at 2921–26 ¶¶ 31–44; *Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996*, Second Report, 15 F.C.C.R. 20913, 20932–37 ¶¶ 42–55 (2000) (“*Second § 706 Report*”); *Ninth Annual Report on Video Programming Delivery*, *supra* note 544, at 37 ¶ 73.

⁵⁵³ See *Annual Assessment of Status of Competition in Market for Delivery of Video Programming*, Seventh Annual Report, 16 F.C.C.R. 6005, 6052 ¶ 102 (2001); *Advanced Television System and Their Impact upon Existing Television Broadcast Service*, Fifth Report and Order, 12 F.C.C.R. 12809, 12820–21 ¶ 29 (1997) (authorizing digital television stations to provide “ancillary and supplementary services,” including data transmission).

⁵⁵⁴ *Third § 706 Report*, 17 F.C.C.R. at 2878 ¶ 80, 2900 ¶¶ 141–143, 2901–02 ¶ 147.

The growth of direct, facilities-based competition to utility poles raises serious questions about whether compelled access represents sound economic policy. Compelled access harms dynamic efficiency in two ways. First, it forces the pole owner to share any benefits that result from investments in its own facilities. And second, compelled access rescues those who need access to such facilities from having to invest in alternative networks capable of providing similar services. Thus, access both lowers the pole owner's incentives to invest in its own facilities as well as deprives the sponsors of substitute network facilities of their natural strategic partners. In so doing, access requirements can forestall the emergence of alternative facilities-based competition to utility poles, which represents the most effective long-term solution to the bottleneck problem.

If regulators are to compel access, however, the best way to mitigate the negative effects is to establish access rates based on market prices. Doing so not only encourages existing participants to employ appropriate levels of network inputs; it also provides appropriate signals to those deciding whether to enter particular markets and to those deciding whether to invest in network facilities. Moreover, the competitive environment is also likely to be sufficiently robust to allow market prices to serve as a reliable benchmark for setting relatively efficient rates. Compelling access to utility poles at submarket rates, in contrast, threatens to make alternative transmission technologies appear artificially unattractive. Therefore, regulation threatens to cause investment in those technologies to fall below efficient levels.

Although the use of a network of utility poles does not consume the poles, this does not justify the conclusion (advanced by the Eleventh Circuit in *Alabama Power*⁵⁵⁵) that it is harmless to compensate the network only for the direct incremental costs of providing access. Economic analysis indicates that the price the pole owner charges is determined by demand-side considerations as well as supply-side considerations. Thus, the market value of an object depends not only on the costs that compelled access forces the network owner to incur, but also on how much the would-be purchaser is willing to pay. The opportunity costs associated with foregoing the arms-length transaction with any single buyer are real economic costs for which the network owner should be compensated.

Finally, with respect to broadband, it is possible that the rates allowed under the Telecom Formula can serve as a reference point for market-based pricing for cable television systems. Admittedly, the prices determined by the Telecom formula are not established in open markets. Nonetheless, application of the Cable Formula typi-

⁵⁵⁵ See *supra* note 530 and accompanying text.

cally leads to significantly lower rates than does application of the Telecom Formula,⁵⁵⁶ thus suggesting that rates established under the Cable Formula are not properly regarded as fair market value. Indeed, the system impairs allocative efficiency by establishing significantly different cost structures for cable modem service and DSL and impedes dynamic efficiency by distorting the investment and entry decisions of these two types of providers. Allowing such a significant differential to persist gives the government too great a role in determining which of these platforms will eventually emerge as the technological winner.

c. *ECPR as a Second-Best Valuation Method*

The growing availability of alternative telecommunications networks is making it increasingly possible for regulatory authorities to base access pricing on actual transactions for comparable services. We acknowledge, however, that many of these technologies are not yet fully deployed and that differences in utilization levels and geographic scope may further limit the usefulness of these transactions as external benchmarks. If this is the case, the appropriate step is for regulators to base rates on ECPR, which requires that rates be set equal to the sum of the direct incremental costs and the opportunity costs associated with providing access.⁵⁵⁷

The current rate-setting methodologies for pole attachments deviate from ECPR in two significant ways. First, the current approaches calculate direct incremental costs on the basis of historical cost rather than forward-looking cost. The FCC has acknowledged that reliance on forward-looking costs would better promote allocative efficiency, observing that, “a firm compares forward-looking costs with existing market prices, in making decisions about entry, expansion, and price.”⁵⁵⁸ As a result, rate-making methodologies based on forward-looking cost help “to ensure the efficient use of existing telecommunications network facilities, and to encourage new entrants to make economically rational decisions about whether or how to enter a local telecommunications market.”⁵⁵⁹ In addition, forward-looking cost pricing reflects efficient replacement of an asset’s functions using the most advanced technology available.⁵⁶⁰ Use of forward-looking costs would also promote dynamic efficiency, because setting prices on the

⁵⁵⁶ See *supra* note 530 and accompanying text.

⁵⁵⁷ See *supra* Part I.C.2.

⁵⁵⁸ Amendments of Commission’s Rules and Policies Governing Pole Attachments, Consolidated Partial Order on Reconsideration, 16 F.C.C.R. 12103, 12116 ¶ 20 (2001) (“*Consol. Reconsideration Order*”).

⁵⁵⁹ *Id.*

⁵⁶⁰ See *id.* at 12118–19 ¶ 24.

basis of forward-looking economic costs would “giv[e] the appropriate signal for new entrants to invest in network facilities.”⁵⁶¹

Despite acknowledging the benefits of using a methodology based on forward-looking cost, the FCC nonetheless persisted in relying on historical cost in setting pole attachment rates, offering several justifications. First, the FCC reasoned that the Pole Attachments Act was designed to stem anticompetitive pricing, not to stimulate competitive entry.⁵⁶² The FCC also suggested that its continued application of a historical cost methodology was justified in part because the technology underlying utility poles was relatively static.⁵⁶³ Finally, the FCC pointed out that investment incentives are less important in the pole attachment context because local zoning and other right-of-way restrictions prevent the construction of duplicative pole networks.⁵⁶⁴

The FCC’s reasoning fails to accord sufficient weight to the arrival of alternative technologies that compete directly with utility pole networks. In terms of static efficiency, the FCC focuses on controlling monopoly pricing even though the emergence of substitute facilities generally causes monopoly rents to dissipate. In focusing too narrowly on the network of utility poles as a universe unto itself, the FCC ignores the fact that substitute facilities, such as DBS and wireless systems, can support transmission of multichannel video program distribution.⁵⁶⁵ In addition, wireless telephony has emerged as a viable alternative to wireline communications. Over time, the growing importance of these substitute media will erode any monopoly power possessed by utility pole owners, if it has not done so already. The most dramatic illustration of this point exists with respect to wireless providers, which the FCC and Supreme Court have concluded fall within the ambit of the Pole Attachments Act.⁵⁶⁶ Wireless providers have an extensive array of alternative locations for their equipment, including communications towers and rooftop placements, eliminating any supposed monopoly power possessed by utility pole owners.⁵⁶⁷ By forcing pole owners to provide wireless carriers with access at rates

⁵⁶¹ *Id.* at 12119 ¶ 25 (citing Amendment of Rules & Policies Governing Pole Attachments, Report and Order, 15 F.C.C.R. 6453, 6460–61 ¶ 9 (2000) (“*Fee Order*”)); *see id.* at 12118–19 ¶ 24 (noting that methodologies based on forward-looking costs give new entrants “the proper cost signals to decide whether to construct their own networks or to use the incumbent’s”).

⁵⁶² *Id.* at 12116–17 ¶¶ 20–21; *see also* Baynes, *supra* note 461, at 177 (arguing that a cost based pricing scheme is better suited to avoid monopoly rents than a market based pricing scheme).

⁵⁶³ *See Consol. Reconsideration Order*, 16 F.C.C.R. at 12118–19 ¶ 24.

⁵⁶⁴ *Id.*

⁵⁶⁵ *See supra* Part III.B.2.b.ii.

⁵⁶⁶ *See supra* note 541 and accompanying text.

⁵⁶⁷ *See supra* Part III.B.2.b.i.

below what they would reach through arms-length negotiations, current regulatory policy interferes with allocative efficiency.

More importantly, by disregarding the impact of below-market rates on investment in alternative technologies, the FCC ignores access rates' impact on dynamic efficiency. For example, the price of access to poles directly affects investment in communication towers and other utility pole substitutes, even though these same access prices may not spur any additional investment in duplicate networks of poles. Furthermore, the dramatic changes in substitute technologies will influence the economics of distributing telecommunications services even if the technology underlying utility poles does not change. It is only by taking an artificially truncated view of the scope of the relevant technologies that the FCC is able to view these considerations as unimportant.

This adverse effect on dynamic efficiency will be particularly dramatic with respect to broadband technologies. As noted earlier, companies are in the process of deploying a wide range of broadband technologies, including PCS, fixed wireless systems, 3G wireless devices, and ancillary and supplementary services provided via spectrum assigned to digital television broadcasting.⁵⁶⁸ The manner in which access to poles is priced will directly and dramatically impact the timing and level of investment in deploying these new technologies.

The second way in which the current rate setting methodology for pole attachments deviates from ECPR is the absence of an element reflecting opportunity cost. The FCC fails to understand that the price of access to networks—a capital asset that is not consumed—should be based on the value of the services sold through the network, not on the costs of constructing it. In addition, the historical cost methodology fails to consider that market value is determined through the interaction between demand and supply and not just supply-side considerations. The FCC's overlashing rules⁵⁶⁹ fall into the same trap. The fact that overlashers may not require pole owners to incur any additional direct costs does not justify allowing overlashers to use networks of utility poles without paying any compensation. If markets are to serve their usual role in promoting the efficient allocation of resources, any such access should reflect not only cost considerations, but also the value of the services made possible by access to the network. Finally, an opportunity cost scheme would be relatively

⁵⁶⁸ See *supra* notes 548–54 and accompanying text. One of the parties in *Alabama Power* also offered expert testimony asserting that railroad and highway rights of way have emerged as yet another way in which broadband providers can bypass the network of utility poles. See *Ala. Cable Telecomms. Ass'n v. Ala. Power Co.*, Order, 16 F.C.C.R. 12209, 12224 ¶ 34 (2001), *aff'd sub nom. Ala. Power Co. v. FCC*, 311 F.3d 1357 (11th Cir. 2002).

⁵⁶⁹ See *supra* notes 520–24 and accompanying text.

easy to implement in this context because the relevant markets—wireless telephony, MVPDs, and broadband—are or are becoming extremely competitive.⁵⁷⁰

These arguments underscore the extent to which access regulations represent an anomaly in competition policy.⁵⁷¹ Rather than breaking up monopolies, compelled access simply forces monopolists to share a bottleneck, thereby saving other firms from having to develop alternative sources of that input. In effect, compelled access cuts off emerging alternative network technologies from their natural strategic partners. As a consequence, it actually entrenches monopoly power by preempting the development of viable alternatives to the bottleneck facility, which represent the only viable long-term solution to the monopoly problem.⁵⁷² This is particularly problematic in technologically dynamic industries such as wireless telephony, video distribution, and the Internet, in which the prospects of developing new ways either to circumvent or to compete directly with the bottleneck are the greatest.

Indeed, applying access requirements to industries characterized by high fixed costs can represent a form of regulatory opportunism. Firms deciding whether to enter such industries *ex ante* will do so only if they can expect to recover their fixed cost investments. Economists have long recognized that once fixed costs are sunk, firms remain vulnerable to *ex post* opportunistic behavior that can beat prices down towards marginal cost because sunk costs should no longer be taken into account.⁵⁷³ The law of contracts, the desire to maintain business relationships, and market reputation effects can mitigate such opportunism in competitive markets.⁵⁷⁴ Regulators' access requirements remain problematic to the extent that they push prices below the levels needed to guarantee full investment.

The FCC's attempts to evade this logic are unpersuasive. In arguing that the relatively static nature of utility pole technology and the practical impossibility of replacing the network render investment incentives less important, the FCC focuses too narrowly on utility poles as a distinct technological universe and fails to give appropriate consideration to substitute technologies. The relevant incentives stimulate investment in alternative networks as much as they stimulate investment in alternative sets of poles. For example, below-market pricing of access to pole networks threatens to dampen television net-

⁵⁷⁰ See Yoo, *supra* note 11, at 227–30, 253–58; *supra* notes 548–54 and accompanying text.

⁵⁷¹ See *supra* note 25 and accompanying text.

⁵⁷² See Yoo, *supra* note 11, at 246.

⁵⁷³ See *id.* at 235.

⁵⁷⁴ *But see id.* (arguing that “such contracts may be costly to negotiate and, in any event, will not be able to anticipate every possible contingency”).

works' incentives to invest in DBS and other alternatives to cable television. Similarly, allowing broadband providers to obtain transmission via utility poles may deprive non-wireline broadband technologies of the support needed to finance their deployment.

In the end, the only justification for the FCC's position is administrative convenience. The FCC argued that for over two decades the historical-cost approach had "provided a stable and certain regulatory framework, that may be applied 'simply and expeditiously' requiring 'a minimum of staff, paperwork and procedures consistent with fair and efficient regulation.'"⁵⁷⁵ The FCC also emphasized that Congress never indicated that it wanted the FCC to deviate from this approach. The FCC "acknowledge[d] that setting prices on the basis of forward-looking economic costs has significant advantages, including that it gives the appropriate signal for new entrants to invest in facilities," but concluded that switching to a methodology based on forward-looking cost would cause excessive disruption and force the Commission to undertake extensive proceedings.⁵⁷⁶

Administrative simplicity ultimately proves too insubstantial to justify the economic losses that result from basing access prices on historical cost. As Justice Breyer observed, although continued reliance on historical costs may provide some administrative advantages, "[w]here the economic problems created by the use of historical cost valuation become serious, special modifications must be made in the process."⁵⁷⁷ The FCC should consider whether the administrative advantages of retaining the existing regime outweigh the long-term benefits of efficient pricing, both in current transactions and in fostering the emergence of direct facilities-based competition to utility poles—the only viable long-term solution to the problems of bottleneck control. Thus, the FCC should not let short-term inconvenience prevent it from amending regulatory policies and procedures in ways that promote substantial long-term benefits.⁵⁷⁸ Indeed, adhering to outmoded methodologies in the name of administrative convenience could preempt many of the benefits expected from the shift from rate regulation to access regulation. By maintaining the status quo the FCC

⁵⁷⁵ Amendment of Rules and Policies Governing Pole Attachments, Report & Order, 15 F.C.C.R. 6453, 6460–61 ¶ 9 (2000) ("*Fee Order*") (quoting S. REP. NO. 95-580, at 21 (1977)); accord Amendments of Commission's Rules and Political Governing Pole Attachments, Consolidated Partial Order on Reconsideration, 16 F.C.C.R. 12103, 12117 ¶ 22, 12119 ¶ 25 (2001) ("*Consol. Reconsideration Order*").

⁵⁷⁶ *Fee Order*, 15 F.C.C.R. at 6460–61 ¶ 9.

⁵⁷⁷ BREYER, *supra* note 29, at 40.

⁵⁷⁸ For other instances in which the FCC has inhibited the emergence of competition by permitting itself to be unduly swayed by one-time costs associated with regulatory change, see Yoo, *Rise and Demise*, *supra* note 37, at 41–44.

risks quashing the benefits this supposed revolution in regulatory policy.

3. *Constitutional Arguments in Favor of Market-Based Pricing*

The Supreme Court's takings jurisprudence also cuts against the FCC's decision to base pole attachment rates on historical cost. As the FCC concedes, the 1996 amendments are "not reasonably susceptible of a reading that gives the pole owner the choice of whether to grant telecommunications carriers or cable television systems access."⁵⁷⁹ Furthermore, the Eleventh Circuit recognized in *Gulf Power I* and confirmed in *Gulf Power II* and *Alabama Power* that the 1996 amendments transformed the Pole Attachments Act from a rate regulation scheme into a compulsory access requirement, thus bringing the entire scheme within *Loretto's* ambit.⁵⁸⁰ The court did not decide the case based on whether the pole owners purchased their property knowing that they would have to put it to a public use.⁵⁸¹ Nor did the utilities' knowledge that their property would be subject to extensive regulation justify forcing the utilities to subject themselves to physical invasions without just compensation.⁵⁸² On the contrary, the court concluded that such an argument had things "backwards," in that "[a] property owner is entitled to expect that the property it acquired via eminent domain . . . came with the right all property has—not to be subject to government-coerced, permanent, physical occupation without just compensation."⁵⁸³

The FCC contended that *Florida Power* foreclosed this argument by holding that the compensation provided by the existing approach to setting pole attachment rates is constitutional.⁵⁸⁴ The FCC main-

⁵⁷⁹ See Implementation of Local Competition Provision in Telecommunications Act of 1996, First Report and Order, 11 F.C.C.R. 15499, 16087 ¶ 1191 (1996) ("*Local Competition Order*").

⁵⁸⁰ See *supra* notes 506–10 and accompanying text.

⁵⁸¹ See *Gulf Power Co. v. FCC*, 187 F.3d 1324, 1329–30 (11th Cir. 1999) (citing *W. Union Tel. Co. v. Pa. R.R. Co.*, 195 U.S. 540, 573 (1904) (noting that even though a railroad's right of way is devoted to public use, "it has always been recognized . . . that a railroad right of way is so far private property as to be entitled to that provision of the Constitution which forbids its taking, except under the power of eminent domain and upon payment of [just] compensation"); *United Rys. & Elec. Co. v. West*, 280 U.S. 234, 249 (1930) (noting that "the property of a public utility, although devoted to the public service and impressed with a public interest, is still private property; and neither the corpus of that property nor the use thereof constitutionally can be taken for a compulsory price which falls below the measure of just compensation")), *overruled on other grounds* by *Fed. Power Comm'n v. Hope Natural Gas Co.*, 320 U.S. 591 (1944)).

⁵⁸² See *id.* at 1329.

⁵⁸³ *Id.* at 1330.

⁵⁸⁴ See *Ala. Cable Telecomms. Ass'n v. Ala. Power Co.*, Order, 16 F.C.C.R. . 12209, 12229–30 ¶¶ 45–46 (2001); see also Amendments of Commission's Rules and Policies Governing Pole Attachments, Consolidated Partial Order on Reconsideration, 16 F.C.C.R. 12103, 12115 ¶ 18 (2001) ("*Consol. Reconsideration Order*") (citing *Duquesne Light and Hope*

tained that *Florida Power* definitively established that the proper standard for resolving all pole attachment takings challenges was the confiscatory rate-making standard as elaborated in *Duquesne Light* and *Hope Natural Gas*.⁵⁸⁵ The FCC's position ignores the sharp distinction between physical and nonpossessory takings drawn by the Supreme Court.⁵⁸⁶ In the words of the Eleventh Circuit:

Characterizing the mandatory access provision as a regulatory condition, even one allegedly designed to foster competition, cannot change the fact that it effects a taking by requiring a utility to submit to a permanent, physical occupation of its property. However laudatory its motive, Congress' power to regulate utilities does not extend to taking without just compensation the right of a utility to exclude unwanted occupiers of its property.⁵⁸⁷

The Supreme Court underscored this point when it explicitly recognized that “[a] permanent physical occupation authorized by government is a taking *without regard to the public interests that it may serve.*”⁵⁸⁸

More specifically, the FCC's conclusion was inconsistent with precedent, which held that confiscatory rate-making principles have no application in determining whether a physical taking has occurred. As the Eleventh Circuit reasoned, “*Duquesne's* discussion of utilities was not in the context of a takings case dealing with the permanent occupation of property. Nothing in *Duquesne* suggests a utility's property is less subject to protection against permanent, physical occupation than anyone else's property. It is not.”⁵⁸⁹ Nor could the 1996 amendments be upheld under a regulatory taking analysis: “[A]lthough property is subject to broad regulatory power, a regulation becomes a taking when the government authorizes permanent, physical occupation by a third party.”⁵⁹⁰ Because the 1996 Act effects a per se taking, the government must ensure that the pole owners receive compensation that reflects the earning potential of the property taken. Fair market value is the accepted basis for determining that earning potential.⁵⁹¹

In apparent recognition of the weakness of its position, the FCC considered the possibility that the Takings Clause required the gov-

Natural Gas in its analysis of just compensation); Amendments of Rules and Policies Governing Pole Attachments, Report and Order, 15 F.C.C.R. 6453, 6459–60 ¶ 8 (2000) (“*Fee Order*”) (citing *Duquesne Light*).

⁵⁸⁵ See *Consol. Reconsideration Order*, 16 F.C.C.R. at 12230–31 ¶¶ 47–48 (citing *Duquesne Light Co. v. Barasch*, 488 U.S. 299 (1989)).

⁵⁸⁶ See *supra* notes 235–36, 276 and accompanying text.

⁵⁸⁷ *Gulf Power Co.*, 187 F.3d at 1331.

⁵⁸⁸ *Id.* (quoting *Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 426 (1982)).

⁵⁸⁹ *Id.* at 1330.

⁵⁹⁰ *Id.* at 1328 (citing *Loretto*, 458 U.S. at 439–40).

⁵⁹¹ See *supra* notes 286–94 and accompanying text.

ernment to give pole owners market-value compensation for access to their poles. Even so, the Commission concluded that “the unusual nature of pole attachments, and the nature of the property interest conveyed,” made it impossible to apply the standard techniques for determining market value.⁵⁹² Specifically, the absence of viable alternatives to the networks of utility poles made it impossible to base market value on comparable sales because all existing market transactions either included monopoly rents or involved property rights “too different to draw any meaningful conclusions.”⁵⁹³ In addition, the FCC found the income capitalization approach too speculative.⁵⁹⁴ Because access to utility poles represented only one of many inputs needed to provide cable television and telecommunications services, it was impossible to determine the income attributable to any one input.⁵⁹⁵ The FCC rejected the replacement-cost approach in part because access did not destroy the pole owner’s property interests, but instead simply imposed an occupation that was “restricted in duration, primacy, exclusivity, and physical manner of use.”⁵⁹⁶ Finally, the FCC reasoned that the replacement cost approach should not be used because it would be infeasible to replace the existing network of utility poles.⁵⁹⁷

The FCC’s arguments are unconvincing. As discussed above, substitute network technologies have made it possible to establish access rates that reflect actual market transactions. Indeed, regulators can analyze wireless carriers’ attachment rates, which are nearly identical transactions. The FCC’s objection to the income capitalization approach ignores the fact that the Supreme Court has sanctioned its use when an asset was simply one of many inputs in a productive process.⁵⁹⁸ Furthermore, the FCC’s grounds for rejecting the replacement cost approach are factually incorrect in one important respect: the access requirement authorizes occupations that are indefinite, not temporary, and that effectively deprive the pole owner of the right to possess, use, and dispose of the occupied property. Indeed, the Supreme Court has recognized that access requirements destroy all of the property owner’s interests with respect to that particular portion of the occupied property.⁵⁹⁹ The infeasibility of replicating a network of utility poles might be relevant if no technological alternatives exist.

⁵⁹² Ala. Cable Telecomms. Ass’n v. Ala. Power Co., Order, 16 F.C.C.R. 12209, 12233 ¶ 53 (2001), *aff’d sub nom.* Ala. Power Co. v. FCC, 311 F.3d 1357 (11th Cir. 2002).

⁵⁹³ *Id.* at 12234 ¶ 55.

⁵⁹⁴ *See id.* at 12233–34 ¶ 56.

⁵⁹⁵ *See id.*

⁵⁹⁶ *Id.* at 12234–35 ¶ 57.

⁵⁹⁷ *Id.*

⁵⁹⁸ *See supra* note 352 and accompanying text.

⁵⁹⁹ *Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 435–36 (1982).

ted. In this case, however, numerous alternative technologies exist that can perform the same functions as utility poles. Thus, the FCC should not disrupt investment signals by basing access rates on historical cost.

In short, the FCC could justify its position only by making two analytical errors. First, it ignored the fundamental change in the takings analysis required by the shift to access regulation, as recognized in *Gulf Power I* and *II*. Second, it ignored the fundamental change in the just compensation analysis required by the emergence of facilities-based competition to networks of utility poles.

As discussed earlier,⁶⁰⁰ the Eleventh Circuit sustained the FCC's action against a takings challenge in *Alabama Power Co. v. FCC*.⁶⁰¹ The court avoided the pitfalls that ensnared the FCC by recognizing that the Takings Clause mandated that pole owners receive market value for granting access and that market value necessarily includes some measure of opportunity costs.⁶⁰² It nonetheless upheld the FCC's rate-setting regime on the assumption that, in the absence of some showing that the poles' capacity was exhausted, the opportunity cost associated with granting access was zero, because granting access did not foreclose the pole owner from selling pole capacity to other firms or using it itself.⁶⁰³

We have previously analyzed the problems associated with these arguments in detail⁶⁰⁴ and need only sketch them again here. Simply put, certain features, including the lumpiness of network capacity, the need to anticipate user requirements, and the importance of ensuring network reliability, make excess capacity a quality that is endemic to telecommunications networks. The conclusion that opportunity costs are zero also conflicts with the fundamental economic principle that market value is determined by demand as well as supply considerations. It simply does not follow that a person who is not currently using a particular piece of property will give it away for free. Instead, the property owner will attempt to use its bargaining position (largely determined by the value of the property to the would-be purchaser) to capture the highest possible price. Therefore, because the Pole Attachments Act effects a physical taking, pole owners are entitled to market value for granting access to their poles, and such value properly includes opportunity cost—the value of the services made possible by that access.

⁶⁰⁰ See *supra* notes 82–85 and accompanying text.

⁶⁰¹ 311 F.3d 1357 (11th Cir. 2002).

⁶⁰² See *id.* at 1368–69.

⁶⁰³ See *id.* at 1369–71.

⁶⁰⁴ See *supra* notes 86–90 and accompanying text. .

C. Access to Broadband Networks

The internet represents perhaps the most significant and far-reaching communications technology to emerge in the last several years, competing variously as a substitute for telephones, faxes, television, radio, postal services, and private data transmission networks. Initially, most U.S. households received internet service through “narrowband” technologies employing an analog modem attached to a conventional telephone line. Although conventional telephone-based connections permit connection speeds of 56.6 thousand bits per second (kbps), typical connection speeds fall in the neighborhood of thirty kbps.⁶⁰⁵

Increasingly, however, U.S. consumers have been turning to “broadband” technologies that allow subscribers to achieve actual speeds in excess of one million bits per second (1 Mbps).⁶⁰⁶ Broadband transmission facilities provide many advantages for customers seeking telecommunications and Internet access services, including speeds up to 100 times faster than standard dial-up services. Moreover, broadband services permit bandwidth-intensive multimedia content with enriched entertainment features, such as video and interactive computer games.⁶⁰⁷ High-bandwidth systems further allow “always-on” service without the inconvenience of repeatedly logging on to connect to the internet. In 2000, the FCC estimated that over one-third of all U.S. online households would subscribe to some form of broadband service within a few years.⁶⁰⁸ Econometric studies also indicate that broadband is not a substitute for dial-up service, but instead constitutes a separate market.⁶⁰⁹ The FCC has declared that “[t]he widespread deployment of broadband infrastructure [was a] central communications policy objective.”⁶¹⁰

One key difference between narrowband and broadband connections to the internet has emerged as the flash point for policy makers. Narrowband customers can use their telephone lines to connect to any one of a large number of internet service providers (ISPs). Broadband providers, however, typically require that their customers em-

⁶⁰⁵ See Speta, *supra* note 142, at 43.

⁶⁰⁶ Most DSL and cable modem users can expect speed somewhere in the neighborhood of 1.5 Mbps, although theoretical speeds are much higher. *Id.* at 52, 56.

⁶⁰⁷ See *id.*

⁶⁰⁸ Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, Second Report, 15 F.C.C.R. 20913, 20983 ¶ 186 (2000) (“*Second § 706 Report*”).

⁶⁰⁹ See Hausman et al., *supra* note 126, at 303–04.

⁶¹⁰ Appropriate Framework for Broadband Access to Internet over Wireline Facilities, Notice of Proposed Rulemaking, 17 F.C.C.R. 3019, 3020–21 ¶ 1 (2002).

ploy a proprietary ISP.⁶¹¹ Policy makers and commentators have begun to explore whether they should compel broadband providers to allow unaffiliated ISPs to employ their transmission networks. Thus, of all the issues surrounding broadband deployment, the controversy over this question has made access to broadband networks “among the most compelling issues in the communications industry.”⁶¹²

This subpart explores the manner in which any such access requirement should be implemented. It begins by reviewing the existing regulatory regimes governing the two principal broadband technologies: digital subscriber lines (DSL) and cable modem systems. It then explores the proper manner in which access to such systems should be priced. We conclude that economic and constitutional considerations both indicate that such access should be priced at market value.

1. *Regulatory Framework*

a. *Digital Subscriber Lines (DSL)*

As noted earlier, DSL represents one of the two principal current technologies for delivering broadband services to residential customers. DSL takes advantage of the fact that conventional voice communications only occupy the lower transmission frequencies (typically those ranging from 300 to 3400 hertz). It is thus possible to use the higher frequencies (those above 20,000 hertz) to convey data communications through the same telephone line without interfering with voice communications. Although there are numerous types of DSL technology,⁶¹³ we shall use the term “DSL” as the generic reference to all forms of the technology.

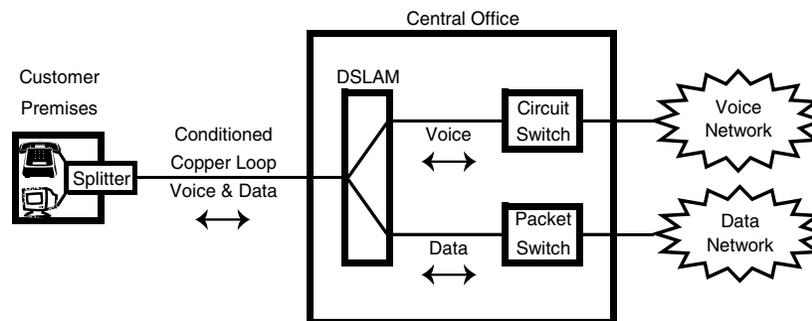
⁶¹¹ For example, before its collapse, Excite@Home, which was the largest ISP serving cable modem subscribers, was owned by such major cable modem providers as AT&T, Comcast, Cox Communications, Cablevision Systems, and Shaw Cablesystems, and was the exclusive ISP for those systems. Time Warner, the second largest high-speed broadband provider, previously required all of its subscribers to use a proprietary ISP called “RoadRunner.” See Applications for Consent to Transfer of Control of Licenses and Section 214 Authorizations from MediaOne Group, Inc., Transferor, to AT&T Corp., Transferee, Memorandum Opinion and Order, 15 F.C.C.R. 9816, 9863 ¶ 107 (2000) (“*AT&T-MediaOne Merger*”).

⁶¹² DEBORAH A. LATHEN, BROADBAND TODAY: A STAFF REPORT TO WILLIAM E. KENNARD, CHAIRMAN, FEDERAL COMMUNICATIONS COMMISSION 10 (Oct. 1999), available at <http://www.fcc.gov/Bureaus/Cable/Reports/broadbandtoday.pdf>.

⁶¹³ The most popular form of DSL is Asymmetric DSL (ADSL), in which download transmission rates are higher than upload rates. Other forms include High-bit-rate DSL (HDSL), which has the same data transmission capacity in each direction and provides the same capacity as a T1 line; Very-high-data-rate DSL (VDSL), which is the fastest DSL technology, but is expensive to deploy and cannot function over sustained distances; and Rate-Adaptive DSL (RADSL), which allows software to adjust the rate of data transmission. The FCC refers to these various technologies as “xDSL,” with the “x” serving as a generic

Several technical changes must be made to a local telephone network before it can be used for DSL. First, the loops used for DSL must be “conditioned” because incumbent LECs often add devices to their loops, such as bridge taps, low-pass filters, and range extenders, which improve their networks’ performance and functionality for transmitting voice calls. Unfortunately, these devices also cause the quality and the speed of DSL service to suffer. Thus, before loops can be used for DSL, all devices that have accumulated on the loop must be removed. In addition, if a single telephone line is used for both voice and data traffic, the carrier must install equipment that can separate voice traffic from data traffic. Typically the carrier will install a device known as a digital subscriber line access multiplexer (DSLAM) in the incumbent LEC’s central office. The relevant loops are connected to the DSLAM, which routes voice communications into a conventional circuit-switched network and data communications into a packet-switched network.

FIGURE 3: TYPICAL CONFIGURATION OF LOCAL TELEPHONE NETWORK PROVIDING DSL SERVICE



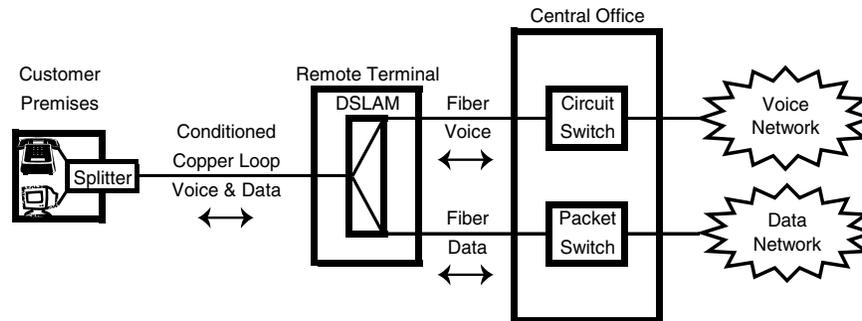
This scenario changes when incumbent LECs have deployed fiber optics to increase the efficiency of their networks through a technology known as “digital loop carriers” (DLCs), as depicted in Figure 4.⁶¹⁴ Instead of using an all-copper loop to transmit analog signals between the central office and the customer’s premises, DLC systems

placeholder for the designation of the particular type of DSL involved. *See id.* at 20–21 & tbl.2. The newest form is G.SHDSL, a new standard recently announced by the International Telecommunications Union, which allows for a symmetric, multi-rate service capable of reaching speeds up to 2.3 Mbps in both directions as well as deployment nearly twice as far from the central office as other forms of DSL. *See Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, Third Report*, 17 F.C.C.R. 2844, 2879 ¶ 83 (2002) (“*Third § 706 Report*”).

⁶¹⁴ *See* William P. Rogerson, *The Regulation of Broadband Telecommunications, the Principle of Regulating Narrowly Defined Input Bottlenecks, and Incentives for Investment and Innovation*, 2000 U. CHI. LEGAL F. 119, 125, 141–42.

use fiber optics to establish a digital connection between the central office and a satellite facility known as a remote terminal. From the remote terminal, the transmission is converted into an analog format and distributed to the customer's premises through a copper sub-loop.⁶¹⁵ The fiber optic connection provides improved efficiency and range that greatly enhance the quality of voice transmissions. DLCs, however, can impede the deployment of DSL because DSL depends on the ability to send and receive signals in an analog format through an all-copper connection. The digital fiber-optic connection between the central office and the remote terminal forces carriers who wish to provide DSL services on a DLC network either to deploy DSLAMs in remote terminals or to find an alternative copper loop running between the customer and the central office.

FIGURE 4: CONFIGURATION OF DSL SERVICE PROVIDED THROUGH DIGITAL LOOP CARRIERS



Policy makers have created two sets of regulations providing for some degree of access to elements of a LEC's DSL network. The first set of regulations originated in a series of FCC proceedings known as the Computer Inquiries.⁶¹⁶ The second set was created by the section of the Telecommunications Act of 1996 that required incumbent LECs to provide unbundled access to certain network elements.⁶¹⁷

i. *The Computer Inquiries*

The first regulatory regime the FCC implemented to govern local telephone companies' broadband services was created during the FCC's Computer Inquiries. Telecommunications companies began to do more than provide customers with a pure transmission path, a

⁶¹⁵ For simplicity, Figure 4 omits the fact that remote terminals are actually deployed in a ring configuration.

⁶¹⁶ See Robert Cannon, *Where Internet Service Providers and Telephone Companies Compete: A Guide to the Computer Inquiries, Enhanced Service Providers and Information Service Providers*, 9 COMM'LAW CONCEPTUS 49, 53–56 (2001).

⁶¹⁷ 47 U.S.C. § 251(c)(6) (2000).

function that came to be known as “basic services.”⁶¹⁸ Instead, companies began to offer what became known as “enhanced services,” which used computer processing to modify the information provided by the customer before routing it to its final destination.⁶¹⁹ Although the LECs could offer the additional functionality provided by combining computer processing and the transmission of those services to end users as a single, integrated product, the lack of transmission capability prevented other enhanced service providers (ESPs) from doing the same. These “pure ESPs” instead depended on the incumbent LEC to provide such transmission services.

Policy makers soon became concerned that the LECs that were formerly part of the Bell network, known as the “Bell Operating Companies” (BOCs), would use their monopoly control over basic services to favor their own, proprietary enhanced services over those offered by unaffiliated ESPs in much the same manner that AT&T had favored its own long distance offerings prior to its breakup.⁶²⁰ The FCC

⁶¹⁸ The regulations defined basic telecommunications services as “the offering of a pure transmission capability over a communications path that is virtually transparent in terms of its interaction with customer supplied information.” Amendment of Section 64.702 of Commission’s Rules and Regulations (Second Computer Inquiry), Final Decision, 77 F.C.C.2d 384, 419–20 ¶¶ 95-96 (1980) (“*Computer II Final Decision*”), *aff’d sub nom.* Computer & Communications Indus. Ass’n v. FCC, 693 F.2d 198, 205 n.18 (D.C. Cir. 1982), *cert. denied*, 461 U.S. 938 (1983).

⁶¹⁹ The regulations define “enhanced services” as “services, offered over common carrier transmission facilities used in interstate communications, which employ computer processing applications that act on the format, content, code, protocol or similar aspects of the subscriber’s transmitted information; provide the subscriber additional, different, or restructured information; or involve subscriber interaction with stored information.” 47 C.F.R. § 64.702(a) (2001). Common contemporary examples include voice mail, electronic mail, electronic store-and-forward, fax store-and-forward, and gateways to online databases such as Westlaw, Lexis, and the Internet. *See Cannon, supra* note 616, at 54.

⁶²⁰ The regulatory regime established by the Third Computer Inquiry (“*Computer III*”) applied only to those LECs that were originally part of the Bell system. The FCC initially applied the *Computer III* rules to both AT&T and the BOCs. *See* Amendment of Sections 64.702 of Commission’s Rules and Regulations (Third Computer Inquiry), Report and Order, 104 F.C.C.2d 958 (1986) (“*Computer III Phase I Order*”). The FCC eventually relieved AT&T of most *Computer III* requirements. *See, e.g.,* Competition in Interstate Interexchange Marketplace, Memorandum Opinion and Order on Reconsideration, 10 F.C.C.R. 4562 (1995); Competition in Interstate Interexchange Marketplace, Report and Order, 6 F.C.C.R. 5880 (1991); Amendment of Sections 64.702 of Commission’s Rules and Regulations (Third Computer Inquiry), Memorandum Opinion and Order on Reconsideration, 2 F.C.C.R. 3035, 3039–40 ¶ 32, 3042–43, ¶¶ 45–53 (1987) (“*Computer III Phase I Reconsideration Order*”). *But see* Filing and Review of Open Network Architecture Plans, Memorandum Opinion and Order, 4 F.C.C.R. 2449 (1988) (“*AT&T ONA Order*”) (ruling that AT&T remains subject to a modified ONA plan the FCC approved in 1988). The FCC later extended some ONA requirements to GTE. *See* Application of Open Network Architecture and Nondiscrimination Safeguards to GTE Corp., Report and Order, 9 F.C.C.R. 4922 (1994) (“*GTE ONA Order*”). The FCC never imposed CEI requirements on GTE. *See Computer III Further Remand Proceedings: Bell Operating Co. Provision of Enhanced Services, Further Notice of Proposed Rulemaking*, 13 F.C.C.R. 6040, 6049 n.30 (1998) (“*Computer III Further Remand Notice*”).

responded in its First and Second Computer Inquiries (“*Computer I* and *II*”) by requiring that BOCs wishing to provide enhanced services to do so through a separate corporate subsidiary.⁶²¹ The order that memorialized the breakup of AT&T similarly prohibited the BOCs from providing “information services,”⁶²² a category determined by the courts and the FCC to be coterminous with “enhanced services,”⁶²³ and ordered the BOCs to provide nondiscriminatory access to all information service providers.⁶²⁴

In its Third Computer Inquiry (“*Computer III*”), the FCC eventually concluded that the costs of the separate subsidiary requirement outweighed the benefits and that nonstructural safeguards would protect against anticompetitive activity just as effectively.⁶²⁵ Consequently, the Commission created a two-phase system of nonstructural restrictions that would allow the BOCs to avoid the separate subsidiary requirement and thereby provide enhanced services on an integrated basis. The first phase, known as comparably efficient interconnection (CEI), required LECs that wished to provide enhanced services without establishing a separate corporate entity to provide unaffiliated ESPs with access to the same basic services the LECs employed to provide their own enhanced service offerings.⁶²⁶ The second phase, known as open network architecture (ONA), required the LECs to

⁶²¹ In its First Computer Inquiry, the FCC drew a distinction between “communications services” and “data processing services.” Regulatory and Policy Problems Presented by the Interdependence of Computer and Communication Services and Facilities, Tentative Decision of the Commission, 28 F.C.C.2d 291, 295 ¶ 15(a) (1970). The FCC also required common carriers other than AT&T who wished to furnish data processing services to do so through a separate corporate subsidiary. See Regulatory and Policy Problems Presented by Interdependence of Computer and Communication Services and Facilities, Final Decision and Order, 28 F.C.C.2d 267, 270–74 ¶¶ 11–22 (1971), *aff’d sub nom.* GTE Serv. Corp. v. FCC, 474 F.2d 724 (2d Cir. 1973). AT&T was precluded from offering data processing services altogether by the 1956 consent decree that terminated antitrust litigation against it. See *id.* at 282 ¶ 39 & n.13.

⁶²² *United States v. AT&T Co.*, 552 F. Supp. 131, 189–90 (D.D.C. 1982), *aff’d mem. sub nom.* Maryland v. United States, 460 U.S. 1001 (1983). The *AT&T* decision defined information services as “the offering of a capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing or making available information which may be conveyed via telecommunications.” *Id.* at 179, 229. Although the court prohibited the BOCs from offering information services, it did allow AT&T to offer most information services after the divestiture of local telephone companies. The only exception was electronic publishing, from which AT&T was to be barred for seven years. See *id.* at 178–86.

⁶²³ *Id.* at 178 n.198; Implementation of the Non-Accounting Safeguards of Sections 271 and 272 of the Communications Act of 1934, as amended, First Report and Order and Further Notice of Proposed Rulemaking, 11 F.C.C.R. 21905, 21955–56 ¶ 102 (1996). As a result, the FCC has used the terms interchangeably. See, e.g., *Computer III* Further Remand Proceedings: Bell Operating Co. Provision of Enhanced Services, Report and Order, 14 F.C.C.R. 4289, 4290–91 n.3 (1999) (“*Computer III* Further Remand Report & Order”); *Computer III* Further Remand Notice, 13 F.C.C.R. at 6042 n.4, 6066 ¶ 40.

⁶²⁴ *AT&T*, 552 F. Supp. at 141 n.40, 195–97.

⁶²⁵ 104 F.C.C.2d at 1002–12 ¶¶ 79–98.

⁶²⁶ See *Computer III* Phase I Order, 104 F.C.C.2d at 1035–43 ¶¶ 147–166.

allow unbundled access to all of their network elements. ONA is substantially broader than CEI because it is not limited to LECs that offer advanced services.⁶²⁷ Moreover, ONA requires that LECs provide access to all of their network elements, not simply those that the LECs were using to provide their own enhanced services.⁶²⁸

In requiring LECs to provide unbundled access to elements of their networks, the FCC refused to require physical collocation under either CEI or ONA.⁶²⁹ Instead, the FCC simply mandated that the LECs minimize transmission costs. Although the FCC recognized that collocation would often represent the most efficient form of equal access available, it also acknowledged that other means might prove more cost effective when space is extremely limited.⁶³⁰

During 1992 and 1993, the FCC lifted the structural separation requirement as soon as individual BOCs had shown that their plans met the ONA requirements.⁶³¹ A series of judicial challenges has failed to resolve the legality of the FCC's *Computer III* regime.⁶³² In

⁶²⁷ See Ameritech's Comparably Efficient Interconnection Plan for Electronic Vaulting Service, Order, 13 F.C.C.R. 80, 84 n.18 (1997); Bell Operating Cos. Joint Petition for Waiver of *Computer II* Rules, Order, 10 F.C.C.R. 13758, 13762-63 ¶ 26 (1995).

⁶²⁸ *Computer III Phase I Order*, 104 F.C.C.2d at 1064-66 ¶¶ 214-217. As originally conceived, ONA appeared to offer LECs' networks to unaffiliated ESPs on an element-by-element basis. The FCC eventually stopped short of such "fundamental unbundling," instead approving a "common ONA model" that did not require the LECs to disaggregate their networks into individual facilities but instead allowed them to provide access of somewhat larger aggregations of network elements. See Filing and Review of Open Network Architecture Plans, Memorandum Opinion and Order, 4 F.C.C.R. 1, 13-14 ¶¶ 5-8, 41-42 ¶ 69 (1988) ("*BOC ONA Order*").

⁶²⁹ See *Computer III Phase I Order*, 104 F.C.C.2d at 1037-38 ¶¶ 151-153, 1042 ¶ 164 (ruling that CEI did not require mandatory collocation); *id.* at 1066 ¶ 218 (extending the same principles to ONA); accord *BOC ONA Order*, 4 F.C.C.R. at 41-42 ¶ 69 (recognizing that the *Computer III Phase I Order* did not order "mandated interconnection on carriers' premises of facilities owned by others").

⁶³⁰ See *Computer III Phase I Order*, 104 F.C.C.2d at 1037-38 ¶¶ 151-153, 1042 ¶ 164; *id.* at 1066 ¶ 218. The FCC has reaffirmed this decision on numerous occasions. See, e.g., Application of Open Network Architecture and Nondiscrimination Safeguards to GTE Corp., Memorandum Opinion and Order, 11 F.C.C.R. 1388, 1414 ¶ 57 (1995); *Computer III Remand Proceedings: Bell Operating Co. Safeguards and Tier 1 Local Exchange Co. Safeguards*, Report and Order, 6 F.C.C.R. 7571, 7600-01 ¶ 64 (1991) ("*Computer III Remand Proceedings*"), *vacated and remanded in part sub nom. California v. FCC*, 39 F.3d 919 (9th Cir. 1994), *cert. denied*, 514 U.S. 1050 (1995); *BOC ONA Order*, 4 F.C.C.R. at 94 ¶¶ 181-183 (1988).

⁶³¹ See *Computer III: Bell Operating Co. Provision of Enhanced Services*, Notice of Proposed Rulemaking, 10 F.C.C.R. 8360, 8366-67 n.22 (1995).

⁶³² The Ninth Circuit initially overturned the *Computer III* regime as arbitrary and capricious on the ground that the FCC had not adequately justified its decision to rely on nonstructural safeguards. See *California v. FCC*, 905 F.2d 1217, 1230-39 (9th Cir. 1990). In response, the FCC strengthened ONA by imposing mandatory price cap regulation on the BOCs and by establishing new cost accounting rules to make anticompetitive activity easier to detect. The FCC also reaffirmed its conclusion that nonstructural safeguards should govern BOC participation in the information services industry. See *Computer III Remand Proceedings*, 6 F.C.C.R. at 7578-88 ¶¶ 14-41, 7617-25 ¶¶ 98-109. As noted earlier,

the meantime, the FCC has continued to require that BOCs and GTE that comply with the ONA plans already filed with and approved by the FCC.⁶³³ Furthermore, courts rejected the FCC's attempt to preclude states from imposing more stringent access requirements on the LECs.⁶³⁴ States were free to impose more stringent requirements over intrastate enhanced services. As will be discussed in greater detail later, certain states, such as Oregon, enacted their own ONA regimes mandating physical collocation.⁶³⁵

ii. *The Telecommunications Act of 1996*

As noted earlier, the 1996 Act requires incumbent LECs to interconnect with other telecommunications carriers on just and reasonable terms and to provide other telecommunications carriers with access to all of their network elements on an unbundled basis.⁶³⁶ In a series of orders, the FCC determined that these statutory obligations apply to many of the elements needed to provide DSL service. Specifically, the FCC ruled that the 1996 Act's interconnection obligations applied to facilities and equipment used to provide data services as well as voice services⁶³⁷ and declined to exempt advanced services from those requirements.⁶³⁸ In addition, the FCC concluded that the high frequency portion of the loop used to carry DSL was subject to

the FCC simultaneously weakened ONA by shifting from a "fundamental unbundling" approach, in which ISPs could obtain access to the BOCs' networks on an element-by-element basis, to a less granular approach, in which unbundling was defined in terms of network services rather than facilities. See *supra* note 628. In *California v. FCC*, the Ninth Circuit again partially vacated the FCC's ONA regime on the ground that the FCC failed to explain the shift away from fundamental unbundling. 39 F.3d at 925–30. The FCC has issued a series of notices attempting to address the concerns raised by the Ninth Circuit. See *Computer III: Bell Operating Co. Provision of Enhanced Services, Notice of Proposed Rulemaking*, 13 F.C.C.R. 6040, 6050–55 (1998); *Computer III Further Remand Proceedings: Bell Operating Co. Provision of Enhanced Servs., Notice of Proposed Rulemaking*, 10 F.C.C.R. 8360, 8370–87 (1995) ("*Computer III Further Remand Proceedings*"). These proceedings, however, are yet to be completed. See *Computer III Further Remand Proceedings: Bell Operating Co. Provision of Enhanced Services, Report and Order*, 14 F.C.C.R. 4289, 4292 n.6 (1999).

⁶³³ Bell Operating Cos.' Joint Petition for Waiver of *Computer II* Rules, Memorandum Opinion and Order, 10 F.C.C.R. 1724, 1730 (Common Carrier Bur. 1995) ("*Interim Waiver Order*"); accord *Computer III Further Remand Proceedings*, 10 F.C.C.R. at 8369 ¶ 11.

⁶³⁴ *California v. FCC*, 905 F.2d at 1239–45.

⁶³⁵ See, e.g., OR. ADMIN. R. 860-035-0110 (2002); *infra* text accompanying note 718.

⁶³⁶ See *supra* notes 13, 47, 395–99 and accompanying text. Initially, the 1996 Act also prohibited BOCs from offering in-region alarm monitoring services, 47 U.S.C. § 275(a)(1) (2000), and temporarily required that BOCs offer information services and electronic publishing through a separate subsidiary, *id.* §§ 272(a)(2)(C), 274(a). These restrictions have since expired. See *id.* §§ 272(f)(2), 274(g)(2), 275(a)(1).

⁶³⁷ Deployment of Wireline Services Offering Advanced Telecommunications Capability, Memorandum Opinion and Order, and Notice of Proposed Rulemaking, 13 F.C.C.R. 24012, 24034–35 ¶¶ 46–47 (1998) ("*Advanced Servs. Order*"), *remanded sub nom.* US W. Communications, Inc. v. FCC, No. 98-1410, 1999 WL 72855 (D.C. Cir. Aug. 25, 1999).

⁶³⁸ See *id.* at 24018 ¶ 12, 24044–48 ¶¶ 69–79.

unbundled access,⁶³⁹ as were most attached electronics.⁶⁴⁰ The FCC also ruled that the forward-looking incremental-cost approach embodied in TELRIC would determine the rates charged for access to DSL components.⁶⁴¹

The FCC stopped short of mandating unbundled access to incumbent LECs' packet-switching technology, including DSLAMs. Although unbundled access to routing and switching capability was appropriate in the circuit-switched market, in which higher utilization rates allowed incumbent LECs to achieve significant economies of scale, incumbent LECs did not maintain a monopoly in the packet-switched market. The FCC recognized that investments in facilities used to provide service to nascent markets, such as broadband, carried significantly greater risks than those in established markets. Therefore, although the failure to mandate unbundled access required entrants to incur the costs associated with collocating their own equipment, the potential adverse effect on investment incentives led the FCC to refuse to mandate unbundled access to DSLAMs and other packet-switching technology.⁶⁴²

The FCC did allow for one exception to this refusal by ruling that incumbent LECs employing DLCs must provide unbundled access to packet-switching equipment when the incumbent LEC has placed a DSLAM in a remote terminal, but has not allowed other carriers to do the same through physical collocation.⁶⁴³ In addition, although incumbent LECs need not provide unbundled access to their own DSLAMs, they must allow requesting carriers to collocate DSLAMs

⁶³⁹ Deployment of Wireline Services Offering Advanced Telecommunications Capability, Third Report and Order in CC Docket No. 98-147 and Fourth Report and Order in CC Docket No. 96-98, 14 F.C.C.R. 20912, 20921-22 ¶¶ 13-14, 20922-23 ¶¶ 16-19, 20926 ¶ 25 (1999) (*Line Sharing Order*); 47 C.F.R. § 51.319(h) (2001); *Advanced Servs. Order*, 13 F.C.C.R. at 24036-38 ¶¶ 52-54. The FCC later clarified that incumbent LECs also must condition (*i.e.*, remove equipment from) loops upon request. *See* Implementation of Local Competition Provisions of Telecommunications Act of 1996, Third Report and Order and Fourth Further Notice of Proposed Rulemaking, 15 F.C.C.R. 3696, 3775 ¶ 172, 3783-84 ¶¶ 190-194 (1999) (*UNE Remand Order*); 47 C.F.R. § 51.319(a)(3), (h)(5). The D.C. Circuit affirmed that incumbent LECs' DSL-based advanced services are subject to 47 U.S.C. § 251(c). *WorldCom, Inc. v. FCC*, 246 F.3d 690, 693-95 (D.C. Cir. 2001). The court did, however, vacate and remand the order for the FCC to determine whether DSL-based advanced services constituted "exchange access" or "telephone exchange service." *Id.* at 695-96.

⁶⁴⁰ *UNE Remand Order*, 15 F.C.C.R. at 3776-77 ¶ 175.

⁶⁴¹ *Line Sharing Order*, 14 F.C.C.R. at 20973 ¶ 132, 20974-81 ¶¶ 135-157.

⁶⁴² *See* *UNE Remand Order*, 15 F.C.C.R. at 3835-37 ¶¶ 306-309, 3839-40 ¶¶ 314-317; *see also* Implementation of Local Competition Provisions of Telecommunications Act of 1996, First Report and Order, 11 F.C.C.R. 15499, 15713 ¶ 427 (1996) (*Local Competition Order*) (declining to "adopt a national rule for the unbundling of packet switches").

⁶⁴³ *UNE Remand Order*, 15 F.C.C.R. at 3838-39 ¶ 313; 47 C.F.R. § 51.319(c)(5). The regulations also require that no spare copper loops capable of providing DSL service be available. *See id.*

and other equipment needed to route data communications into the requesting carrier's packet-switched network.⁶⁴⁴

The FCC's conclusions with respect to collocation largely paralleled its conclusions with respect to interconnection and unbundled access. Carriers could collocate transmission and termination equipment, including multiplexers on LEC premises. New entrants were not permitted, however, to collocate packet switches and other equipment used solely to provide enhanced services, because such equipment was unrelated to the transmission and termination of telephone exchange service and exchange access.⁶⁴⁵ The FCC later clarified the manner in which these rules applied to multifunction equipment by explaining that incumbent LECs must permit collocation of any equipment that was "used or useful for interconnection or access to unbundled network elements, regardless of any other functionalities that may be offered by that equipment."⁶⁴⁶ As a result, competitors had the right to collocate equipment such as DSLAMs, routers, ATM multiplexers, and remote switching modules, which are designed both to terminate and switch broadband traffic.⁶⁴⁷

The D.C. Circuit struck down the FCC's decision permitting the collocation of multifunction equipment.⁶⁴⁸ The court reasoned that the FCC's decision to mandate collocation of any equipment used or useful for interconnection or access to unbundled network elements conflicted with the statutory requirement that collocation be limited to equipment that was "necessary to achieve reasonable physical collocation."⁶⁴⁹

A subsequent D.C. Circuit decision also struck down the FCC's decision requiring unbundled access to the high frequency portion of local loops.⁶⁵⁰ The court based this decision on the FCC's own findings that DSL providers faced "robust competition" from cable modem providers and, to a lesser extent, satellite broadband provid-

⁶⁴⁴ See Deployment of Wireline Services Offering Advanced Telecommunications Capability, Fourth Report and Order, 16 F.C.C.R. 15435, 15460-63 ¶¶ 45-51 (2001) ("*Collocation Remand Order*"), *aff'd sub nom.* Verizon Tel. Cos. v. FCC, 292 F.3d 903 (D.C. Cir. 2002).

⁶⁴⁵ See *Local Competition Order*, 11 F.C.C.R. at 15794-96 ¶¶ 580-581.

⁶⁴⁶ Deployment of Wireline Services Offering Advanced Telecommunications Capability, First Report and Order and Notice of Proposed Rulemaking, 14 F.C.C.R. 4761, 4776-79 ¶¶ 28-31 (1999) ("*Collocation Order*").

⁶⁴⁷ See *id.* at 4776-77 ¶¶ 27-28.

⁶⁴⁸ GTE Serv. Corp. v. FCC, 205 F.3d 416, 418-19 (D.C. Cir. 2000). For an earlier discussion of this case, see *supra* notes 408, 463, 483 and accompanying text.

⁶⁴⁹ *GTE Serv. Corp.*, 205 F.3d at 426 (internal quotations omitted). In so holding, the D.C. Circuit invoked the Supreme Court's admonition that the term "necessary" must be construed according to its ordinary meaning, which is limited to what is "required to achieve a desired goal" and is not so broad as to apply to anything that simply increases the requesting carrier's costs. *Id.* at 423-24 (emphasis added) (citing *AT&T Corp. v. Iowa Utils. Bd.*, 525 U.S. 366, 389-90 (1999)).

⁶⁵⁰ *United States Telecom Ass'n v. FCC*, 290 F.3d 415, 428-29 (D.C. Cir. 2002).

ers.⁶⁵¹ In fact, cable modems established the early lead, capturing fifty-four percent of the market for high-speed lines, while DSL captured only twenty-eight percent.⁶⁵² At this point in the race, however, “no competitor has a large embedded base of paying residential consumers,” and as a result the “record does not indicate that the consumer market is inherently a natural monopoly.”⁶⁵³ Drawing guidance from Justice Breyer’s observation that mandatory unbundling creates innovation and investment disincentives and embroils network owners in the “tangled management inherent in shared use of a common resource,”⁶⁵⁴ the D.C. Circuit concluded that compelling access to the high frequency portions of loops exceeded the “necessary” and “impair” requirements of the 1996 Act.⁶⁵⁵

In response, the FCC ruled that the high frequency portion of the loop and fiber and hybrid fiber-copper loops are no longer unbundled network elements.⁶⁵⁶ In addition, the FCC revised its rules to limit collocation of multifunction equipment to equipment that provides the requesting carrier either with interconnection that is “equal in quality” to that provided by the incumbent LEC for its own services or with “nondiscriminatory access to one or more unbundled network elements.”⁶⁵⁷ The FCC asserted that even if the collocation effected a per se taking, any issues relating to just compensation can be addressed after the implementation of an actual rate order.⁶⁵⁸ The parties did not press any constitutional issues in their unsuccessful judicial challenge to the revised rules.⁶⁵⁹

⁶⁵¹ See *id.* at 428.

⁶⁵² *Id.* at 429 (citing Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of Telecommunications Act of 1996, Notice of Proposed Rulemaking, 17 F.C.C.R. 2844, 2864 ¶ 44, 2865 ¶ 48 (2002)).

⁶⁵³ *Id.* at 428–29 (internal quotation marks omitted) (quoting Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of Telecommunications Act of 1996, Report, 14 F.C.C.R. 2398, 2423 ¶ 48 (1999)).

⁶⁵⁴ See *id.* at 429 (citing *AT&T Corp. v. Iowa Utils. Bd.*, 525 U.S. 366, 428–29 (1999) (Berger, J., concurring in part, dissenting in part)).

⁶⁵⁵ See *id.* (holding that the FCC’s Line Sharing Order was tainted by the same error as the provisions discussed in the earlier portions of the opinion, which focused on the “necessary” and “impair” standards). For a more complete description of these standards, see *supra* note 408 and accompanying text.

⁶⁵⁶ Attachment to Triennial Review Press Release 2 (F.C.C. Feb. 20, 2003), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-231344A2.pdf.

⁶⁵⁷ Deployment of Wireline Services Offering Advanced Telecommunications Capability, Fourth Report and Order, 16 F.C.C.R. 15435, 15454 ¶¶ 32–44 (2001) (“*Collocation Remand Order*”).

⁶⁵⁸ See Deployment of Wireline Services Offering Advanced Telecommunications Capability, Order on Reconsideration and Second Further Notice of Proposed Rulemaking in CC Docket No. 8-147 and Fifth Further Notice of Proposed Rulemaking in CC Docket No. 96-98, 15 F.C.C.R. 17806, 17839 ¶ 69 (2000) (“*Collocation Reconsideration Order*”).

⁶⁵⁹ See *Verizon Tel. Cos. v. FCC*, 292 F.3d 903, 905 (D.C. Cir. 2002).

iii. *Reconciling the Two Regimes*

Although some commentators have suggested that the Telecommunications Act of 1996 superseded the *Computer III* regime,⁶⁶⁰ both regimes continue to govern in slightly different spheres. For example, the range of entities that must *provide* access under the 1996 Act is broader than the range of entities that must do so under *Computer III*, because the relevant provisions of the 1996 Act cover all incumbent LECs, whereas ONA applies only to BOCs and, in some cases, GTE.⁶⁶¹ In addition, a narrower range of entities may *request* access under the 1996 Act than may request access under *Computer III*. Because the interconnection and unbundled access provisions of the 1996 Act extend only to “telecommunications carriers”⁶⁶²—those who offer transport services to the public without changing the form or content of the information⁶⁶³—it does not cover pure ESPs, which use computer processing to modify user-supplied information without providing transmission services to end users.⁶⁶⁴ Finally, the two regimes have different geographic scopes.⁶⁶⁵

The FCC launched a series of proposals reconsidering various features of the current regulatory regime. For example, the FCC reevaluated whether the high-frequency portion of the loop should continue to be a network element subject to unbundled access.⁶⁶⁶ At

⁶⁶⁰ See, e.g., Cannon, *supra* note 616, at 68.

⁶⁶¹ See *supra* note 620. GTE merged with Bell Atlantic to form Verizon. See Peter J. Howe, *Regulators OK Bell Atlantic-GTE Merger*, BOSTON GLOBE, June 17, 2000, at C1.

⁶⁶² 47 U.S.C. § 251(c)(2)–(3) (2000).

⁶⁶³ See *id.* § 153(43), (44), (46). The FCC determined that telecommunications carriers remain within the scope of the interconnection and unbundled access provisions of the 1996 Act even if they offer information services through the same arrangement. Implementation of Local Competition Provisions of Telecommunications Act of 1996, First Report & Order, 11 F.C.C.R. 15499, 15990 ¶¶ 992–995 (1996) (“*Local Competition Order*”).

⁶⁶⁴ Computer III Further Remand Proceedings: Bell Operating Co. Provision of Enhanced Services, Further Notice of Proposed Rulemaking, 13 F.C.C.R. 6040, 6061 ¶ 32, 6090 ¶ 92 (1998) (“*Computer III Further Remand Notice*”). Pure ISPs provide only information services. See 47 U.S.C. § 153(20).

⁶⁶⁵ The separate affiliate requirements for BOC provision of information services under the 1996 Act are limited to interLATA information services, 47 U.S.C. § 271(a), except with regard to electronic publishing services, which must be provided through a separate affiliate regardless of whether it is offered on an interLATA or on an intraLATA basis, 47 U.S.C. § 274(a). The separate subsidiary requirements enacted by *Computer II* and the nonstructural safeguards enacted by *Computer III* do not distinguish between interLATA and intraLATA information services. Implementation of the Non-Accounting Safeguards of Section 271 and 272 of the Communications Act of 1934, as Amended, First Report and Order and Further Notice of Proposed Rulemaking, 11 F.C.C.R. 21905, 21969–70 ¶¶ 132–134 (1996) (“*Non-Accounting Safeguards Order*”). As a result, interLATA information services are subject to both section 271 of the 1996 Act and ONA/CEI. IntraLATA services (except electronic publishing) are subject only to CEI and ONA. *Id.*

⁶⁶⁶ See Review of Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers, Notice of Proposed Rulemaking, 16 F.C.C.R. 22781, 22805–06 ¶ 53 (2001) (“*Triennial UNE Review Notice*”).

the same proceeding, the FCC solicited comments on the rules governing unbundling.⁶⁶⁷ The FCC also sought comments on the physical collocation rules of DSLAMs and other equipment at remote terminals.⁶⁶⁸ Finally, the FCC opened a sweeping inquiry attempting to rationalize these two regulatory regimes. In particular, this proceeding explored whether technological changes or the enactment of the 1996 Act justify or require the modification or elimination of part or all of the CEI and ONA regime created by *Computer III*.⁶⁶⁹

For the purposes of this Article, the key fact is that unlike the federal ONA regime, the 1996 Act and certain state ONA regimes give requesting carriers the right to collocate DSLAMs and switching and routing equipment on the incumbent LEC's property, whether in central offices or remote terminals.⁶⁷⁰ Like all unbundled network elements governed by the 1996 Act, the rates that incumbent LECs may charge for conditioned loops and physical collocation are governed by TELRIC.⁶⁷¹

b. *Cable Modem Systems*

Cable modems represent the other principal technology for providing broadband services to residential customers.⁶⁷² Cable modem systems provide data communications through the network of coaxial cables originally designed to provide a uniform stream of video programming in one direction running from the network to all subscribers. Before a cable network can be used to provide cable modem service, it must be transformed from the typical tree-and-branch infrastructure associated with transmitting television programming into a ring or star-type infrastructure. This is usually accomplished through a hybrid fiber-coaxial (HFC) architecture similar to the DLC architecture discussed above.⁶⁷³ In an HFC architecture, fiber optic cables are used to connect the cable headend to a satellite facility known as a neighborhood node. The final connection between the neighbor-

⁶⁶⁷ *Id.* at 22809 ¶ 61 (requesting comments on the rule requiring unbundled access to DSLAMs in remote terminals where collocation is impossible and alternative copper loops are unavailable); Deployment of Wireline Services Offering Advanced Telecommunications Capability, Order on Reconsideration & Second Further Notice of Proposed Rulemaking in CC Docket No. 8-147 and Fifth Further Notice of Proposed Rulemaking in CC Docket No. 96-98, 15 F.C.C.R. 17806, 17851-54 ¶¶ 103-112 (2000) ("*Collocation Reconsideration Order*") (opening general inquiry into unbundled access at remote terminals).

⁶⁶⁸ See *Collocation Reconsideration Order*, 15 F.C.C.R. at 17851-54 ¶¶ 104-112 (2000).

⁶⁶⁹ Appropriate Framework for Broadband Access to Internet over Wireline Facilities, Notice of Proposed Rulemaking, 17 F.C.C.R. 3019, 3040-43 ¶¶ 43-53 (2002).

⁶⁷⁰ See *supra* notes 375, 384, 634 and accompanying text.

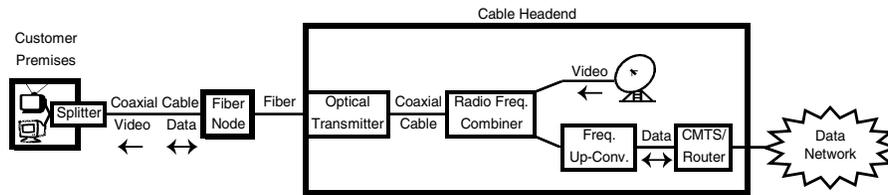
⁶⁷¹ See *supra* notes 408-15 and accompanying text.

⁶⁷² The ensuing regulatory history draws on the discussion in Yoo, *supra* note 11, at 175-76, 250-51.

⁶⁷³ See *supra* note 614 and accompanying text. For simplicity, Figure 5 omits the fact that fiber rods are actually deployed in a ring configuration.

hood node and the subscribers is made through copper-based coaxial cables. Cable modem service also requires special equipment at the headend known as frequency up-converter to segregate the video at data streams onto different channels. A device known as a cable modem termination system (CMTS) in turn separates and connects the flow of data to the various broadband services, such as e-mail, IP telephony, content cached locally, and content residing on the World Wide Web.

FIGURE 5: TYPICAL CONFIGURATION OF CABLE MODEM SYSTEM



The principal access-related policy question regarding cable modem systems is the extent to which the government should ensure that cable modem customers have some degree of choice among ISPs. Litigants and commentators have described this issue as either “open access” or “forced access,” depending on the particular biases of the party using the term.⁶⁷⁴ In an attempt to sidestep the political overtones associated with either designation, the FCC opted to refer to the issue as “multiple ISP access.”⁶⁷⁵

Questions about multiple ISP access first arose during the FCC’s review of AT&T’s proposed acquisitions of TCI and MediaOne. A number of parties argued that allowing AT&T to bring both physical transmission and ISP services under the same corporate umbrella would allow AT&T to use its control over cable to harm competition in the market for ISPs. Consequently, these parties asked the FCC to force AT&T to allow independent ISPs to interconnect with AT&T’s cable modem service network on nondiscriminatory terms.⁶⁷⁶ Consistent with its longstanding policy of nonregulation of computer-based

⁶⁷⁴ See Applications for Consent to Transfer of Control of Licenses and Section 214 Authorizations from MediaOne Group, Inc., Transferor, to AT&T Corp., Transferee, Memorandum Opinion and Order, 15 F.C.C.R. 9816, 9866 ¶ 114 (2000) (“*AT&T-MediaOne Merger*”).

⁶⁷⁵ Inquiry Concerning High-Speed Access to the Internet Over Cable and Other Facilities, Declaratory Ruling and Notice of Proposed Rulemaking, 17 F.C.C.R. 4798, 4839 ¶ 72 (2002) (internal quotation marks omitted).

⁶⁷⁶ See *AT&T-MediaOne Merger*, 15 F.C.C.R. at 9866 ¶¶ 114–115; Applications for Consent to Transfer of Control of Licenses and Section 214 Authorizations from Tele-Communications, Inc., Transferor, to AT&T Corp., Transferee, Memorandum Opinion and Order, 14 F.C.C.R. 3160, 3197–98 ¶ 75 (1999) (“*AT&T-TCI Merger*”).

services,⁶⁷⁷ the FCC refused to impose multiple ISP access as a merger condition in either case.⁶⁷⁸

Because cable operators are subject to municipal as well as federal regulation, advocates of multiple ISP access pressed their arguments before municipal regulators. Some of these municipal authorities turned out to be more accommodating than the FCC, either mandating open access by municipal ordinance⁶⁷⁹ or requiring it as a condition for the license transfer needed to complete AT&T's acquisitions of TCI and MediaOne.⁶⁸⁰ A series of judicial decisions holding that municipal franchising authorities lacked the jurisdiction to compel multiple ISP access soon cut short these municipal regulations.⁶⁸¹

Multiple ISP access advocates were unable to garner sustainable victories until the merger between America Online and Time Warner. The Federal Trade Commission (FTC) order approving the merger required that AOL Time Warner allow cable modem subscribers the option of choosing from among at least three unaffiliated ISPs in addition to its proprietary ISPs, America Online and RoadRunner.⁶⁸²

⁶⁷⁷ See, e.g., Amendment of Section 64.702 of Commission's Rules and Regulations (Second Computer Inquiry), Order, 77 F.C.C.2d 384, 433 ¶¶ 124-127 (1980) ("Computer II Final Decision"), *aff'd sub nom.* Computer & Communications Indus. Ass'n v. FCC, 693 F.2d 198 (D.C. Cir. 1982), *cert. denied*, 461 U.S. 938 (1983); Regulatory and Policy Problems Presented by Interdependence of Computer and Communication Services and Facilities, Final Decision and Order, 28 F.C.C.2d 267, 270 ¶ 11 (1970), *aff'd sub nom.* GTE Serv. Corp. v. FCC, 474 F.2d 724 (2d Cir. 1973).

⁶⁷⁸ *AT&T-MediaOne Merger*, 15 F.C.C.R. at 9872-73 ¶ 127; *AT&T-TCI Merger*, 14 F.C.C.R. at 3205-08 ¶¶ 92-96.

⁶⁷⁹ See *Comcast Cablevision of Broward County, Inc. v. Broward County*, 124 F. Supp. 2d 685, 686-87 (S.D. Fla. 2000).

⁶⁸⁰ See *MediaOne Group, Inc. v. County of Henrico, Va.*, 257 F.3d 356, 360 (4th Cir. 2001); *AT&T Corp. v. City of Portland*, 216 F.3d 871, 875 (9th Cir. 2000). See generally LATHEN, *supra* note 612, at 14-15 (describing mandated access proposals in Portland, Broward County, Florida, San Francisco, and Fairfax, Virginia, as well as initiatives in other localities).

⁶⁸¹ The Ninth Circuit's decision followed from its conclusion that cable modem service constituted a "telecommunications service[.]" *AT&T*, 216 F.3d at 878-79. The Fourth Circuit was more circumspect about the proper regulatory classification of cable modem service, holding instead that requiring open access violated 47 U.S.C. § 541(b)(3)(D) (2000), which prohibits franchising authorities from requiring cable operators to provide telecommunications facilities. *MediaOne*, 257 F.3d at 362-65.

⁶⁸² The FTC order allowed AOL Time Warner to begin providing cable service in twenty specifically identified geographic areas, provided that cable modem subscribers had the option of subscribing to Earthlink and that AOL Time Warner made at least two additional unaffiliated ISP options available within ninety days. See *America Online, Inc.*, No. C-3989, slip op. at 6-7 (F.T.C. Dec. 18, 2000) (Decision and Order), available at <http://www.ftc.gov/os/2000/12/aoldando.pdf>. The order did not condition the initial offering of services on the availability of Earthlink as an option in any other geographic area. Instead, it simply required AOL Time Warner to provide at least three unaffiliated ISPs within ninety days of making its own ISP services available. See *id.* at 8. The FTC also authorized the appointment of a trustee to monitor compliance with its order. See *id.* at 12-14.

The order also required AOL Time Warner to provide all of these unaffiliated ISPs with “Access,”⁶⁸³ which the order defined as the right to interconnect at the same connection points that AOL Time Warner provided to its own affiliated ISPs.⁶⁸⁴ In addition, the order required that AOL Time Warner not discriminate against the unaffiliated ISPs’ content,⁶⁸⁵ and that all ISP service agreements include a “most favored nation clause,” allowing unaffiliated ISPs to avail themselves of the most attractive terms obtained by AOL from other unaffiliated cable systems.⁶⁸⁶

Although it had rejected similar arguments in relation to AT&T’s acquisitions of TCI and MediaOne,⁶⁸⁷ the FCC abruptly reversed course, endorsing the FTC’s requirement that Time Warner and America Online negotiate open access with at least three unaffiliated ISPs as a condition of their merger.⁶⁸⁸ Although the FCC claimed that its decision did not “portend” how it would resolve multiple ISP access as a matter of general regulatory policy,⁶⁸⁹ the breadth of its reasoning suggested that it might approve even more sweeping action in the future.⁶⁹⁰ In fact, AT&T and Comcast voluntarily agreed to undertake a limited form of multiple ISP access, apparently to boost their chances of regulatory approval for Comcast’s acquisition of AT&T’s cable properties.⁶⁹¹

Since then, however, the FCC’s initial reticence to impose multiple ISP access seems to have reasserted itself. For example, the FCC concluded that cable modem service is an interstate “information service.”⁶⁹² This decision has twofold significance. First, by rejecting the Ninth Circuit’s conclusion that cable modem services constituted “telecommunications services,”⁶⁹³ the FCC removed cable modem service from the interconnection, unbundled access, and physical collo-

⁶⁸³ *Id.* at 11.

⁶⁸⁴ *Id.* at 2.

⁶⁸⁵ *Id.* at 11.

⁶⁸⁶ *Id.* at 9.

⁶⁸⁷ *See supra* note 678 and accompanying text.

⁶⁸⁸ *See* Applications for Consent to the Transfer of Control of Licenses and Section 214 Authorizations by Time Warner Inc. and America Online, Inc., Transferors, to AOL Time Warner Inc., Transferee, Memorandum Opinion and Order, 16 F.C.C.R. 6547, 6568–69 ¶ 57 (2001) (“*AOL-Time Warner Merger*”).

⁶⁸⁹ *Id.* at 6569 ¶ 58.

⁶⁹⁰ *See id.* at 6581–6600 ¶¶ 80–125.

⁶⁹¹ *See* Julia Angwin, *AT&T to Offer EarthLink Inc. on Cable Lines*, WALL ST. J., Mar. 13, 2002, at B7; Julia Angwin, *Comcast, United Online Set Deal for Internet Service on Cable Lines*, WALL ST. J., Feb. 27, 2002, at B4.

⁶⁹² Inquiry Concerning High-Speed Access to Internet Over Cable and Other Facilities, Declaratory Ruling and Notice of Proposed Rulemaking, 17 F.C.C.R. 4798, 4820–32, ¶¶ 34–59 (2002) (“*Cable Modem NPRM*”).

⁶⁹³ *Id.* at 4831–32 ¶¶ 56–58.

ation requirements contained in the 1996 Act.⁶⁹⁴ Second, the FCC's decision placed cable modems in a regulatory category traditionally associated with nonregulation. Therefore, the classification of cable modem service as an information service was generally regarded as a signal that the FCC was unlikely to mandate multiple ISP access.⁶⁹⁵ The FCC acknowledged that this remained an open issue and requested comments on the relative merits of imposing multiple ISP access,⁶⁹⁶ as well as on the free speech and takings implications of compelling such access.⁶⁹⁷

The order approving Comcast's acquisition of AT&T's cable businesses cast further doubts on the Commission's willingness to impose multiple ISP access.⁶⁹⁸ Notably, the FCC downplayed its role in the multiple ISP access mandate imposed during the AOL-Time Warner merger. The Commission argued that the unaffiliated ISP condition was imposed by the FTC and that the FCC's only contribution to the process was to require that any such access, provided voluntarily or otherwise, be offered on a nondiscriminatory basis. In addition, the FCC argued that multiple ISP access was justified in that case because the merger brought the nation's largest ISP, second largest cable operator, and some of the largest libraries of multimedia content available under the same corporate umbrella. The AT&T-Comcast merger posed no similar risks. Indeed, Comcast had already made a commitment to support ISP choice and was already bound by contract to allow a number of unaffiliated ISPs access to its system. As a result, the FCC concluded that any further multiple ISP requirements were unnecessary.⁶⁹⁹

2. *Economic Arguments in Favor of Market-Based Pricing*

If the government mandates access to broadband inputs, economic analysis indicates that access rates should be based on market prices. As we have repeatedly emphasized, this would promote allocative efficiency by giving both purchasers and providers the appropriate signals for calibrating consumption and production levels. In addition, basing access rates on market prices would enhance dynamic efficiency by providing the incentives necessary to attract the

⁶⁹⁴ Interestingly, classifying cable modem service as an information service possibly subjected it to municipal regulation, as demonstrated by the FCC's active solicitation of comments on this specific point. See *id.* at 4849 ¶ 100.

⁶⁹⁵ See Yochi J. Dreazen, *FCC Ruling Frees Cable-TV Firms from Sharing Wires*, WALL ST. J., Mar. 15, 2002, at B2.

⁶⁹⁶ *Cable Modem NPRM*, 17 F.C.C.R. at 4839–41 ¶ 74, 4843–47 ¶¶ 83–93.

⁶⁹⁷ *Id.* at 4843 ¶¶ 80–81.

⁶⁹⁸ Applications for Consent to the Transfer of Control of Licenses from Comcast Corp. & AT&T Corp., Transferors, to AT&T Comcast Corp., Transferee, Memorandum Opinion and Order, 17 F.C.C.R. 23246, 23299–300 ¶ 135 (2002).

⁶⁹⁹ *Id.* at 22300–01 ¶¶ 135–137.

investments needed to finance the deployment of the various broadband technologies. As the FCC has repeatedly recognized, issues surrounding investment and innovation are of the utmost importance when the market involved “is a nascent one.”⁷⁰⁰

Although at one time market prices might have been difficult to determine, the emergence of new technologies capable of providing high-speed broadband services make this task increasingly easy. As noted earlier, DSL and cable modem systems are currently competing vigorously for early dominance of the broadband industry. Although both technologies are generally assumed to constitute natural monopolies, formal models calibrated on engineering data suggest that as many as seventy percent of U.S. households may eventually be able to choose from up to three wireline broadband providers.⁷⁰¹ In addition, communications companies provide broadband services through a wide variety of wireless technologies, including PCS, MDS, ancillary and supplemental service provided via digital television, and 3G mobile wireless devices.⁷⁰² These services are similar in geographic scope to those provided by cable modem and local telephone systems. Although these services are still in their nascent stages, when fully operational they should provide a ready basis for determining the value of the transmission of services.

In addition, DBS companies provide satellite broadband services that are beginning to compete directly with cable modem systems and ADSL.⁷⁰³ These too can provide a market-based benchmark for the value of network services. Because DBS is necessarily national in scope and because the quality of the broadband services may differ, any direct comparison between DBS and other more regional wireline broadband services can be complicated. Nevertheless, these substitutes can provide useful guidance as to the value of services under a regime of compelled access.

If these alternative technologies are insufficiently developed to allow direct determination of market prices, economic theory indicates that regulatory authorities should base rates on ECPR, which sets rates as the sum of the forward-looking incremental cost and the opportunity cost associated with providing access.⁷⁰⁴ The opportunity cost of providing network access is determined by subtracting direct incremental costs from the retail price in the final goods market. The

⁷⁰⁰ See, e.g., *Cable Modem NPRM*, 17 F.C.C.R. at 4802 ¶ 5; Deployment of Wireline Services Offering Advanced Telecommunications Capability, First Report and Order and Notice of Proposed Rulemaking, 14 F.C.C.R. 4761, 4763 ¶ 2 (1999) (“*Collocation Order*”).

⁷⁰¹ See Gerald R. Faulhaber & Christian Hogendorn, *The Market Structure of Broadband Telecommunications*, 48 J. INDUS. ECON. 305, 321 (2000).

⁷⁰² See *supra* notes 549, 552–53, 652–53 and accompanying text.

⁷⁰³ See *supra* note 551 and accompanying text.

⁷⁰⁴ See *supra* Part I.C.3.

FCC has been reluctant to allow this method, primarily because the retail prices supposedly reflected monopoly returns.⁷⁰⁵ Although this position is at least arguable in the case of local telephony,⁷⁰⁶ it is unsupported in the case of broadband. The FCC and the courts have recognized that vibrant competition exists, and the impending arrival of additional competitors should only cause it to intensify.⁷⁰⁷

Indeed, the presence of this competition raises serious questions whether compelling access to high-speed broadband facilities represents sensible economic policy. Access requirements only make sense if a true bottleneck facility provides a company with a natural monopoly. When competition exists, compelled access at best accomplishes nothing, because parties who negotiate agreements on other terms will simply negotiate around access rates that are set too high.⁷⁰⁸ Access rates that are set too low, however, can harm allocative efficiency by creating the shortages and distortions inevitably associated with prices that are not calibrated to balance supply and demand.⁷⁰⁹

Worse yet, compelled access can harm dynamic efficiency by eliminating the need for firms to invest in substitute facilities. By rescuing those who need alternative means of transmission from having to invest in alternative capacity, access requirements can forestall the emergence of competition by depriving other facilities-based competitors of their natural strategic partners.⁷¹⁰ Access requirements can thus have the perverse effect of cementing the existing technologies into place. The FCC's notice of proposed rulemaking acknowledges this by underscoring the importance of taking a more functional approach⁷¹¹ and recognizing the emergence of multiple options in providing broadband service, including cable, telephony, wireless, and satellite.⁷¹² Indeed, it was the emergence of this competition that led the FCC to seek comment on whether access requirements should be eliminated.⁷¹³

Thus, there is good reason to question whether the FCC should compel access to broadband networks. If it does, it should base the rates for such access on market prices. Any attempt to base prices solely on direct cost, as under the current TELRIC regime, fails to

⁷⁰⁵ See *supra* notes 418, 447 and accompanying text.

⁷⁰⁶ See *supra* notes 418, 479 and accompanying text.

⁷⁰⁷ See *supra* notes 548–54, 653 and accompanying text.

⁷⁰⁸ This presumes that access rates will follow the model established by the 1996 Act and, rather than requiring carriers to provide services on a tariffed basis, allow parties to negotiate their own arrangements.

⁷⁰⁹ See *supra* Part I.B.1.

⁷¹⁰ See, e.g., *supra* notes 25, 455–56 and accompanying text.

⁷¹¹ See Appropriate Framework for Broadband Access to the Internet over Wireline Facilities, Notice of Proposed Rulemaking, 17 F.C.C.R. 3019, 3023 ¶ 7 (2002).

⁷¹² See *id.* at 3037–38 ¶¶ 36–37.

⁷¹³ See *id.* at 3040–42 ¶¶ 44–48.

acknowledge that market value of network access is determined by the value of the services sold through the network, not the cost of the network itself.⁷¹⁴ Not only is this appropriate in light of the fact that networks are capital assets that are not consumed, but it also reflects the demand-side considerations that underlie economic analysis. The presence of substitute facilities should permit market value to be determined through a comparison to actual market transactions or through the opportunity cost component mandated by ECPR. The presence of direct competition makes it unlikely that prices set in this manner will allow network owners to recover supracompetitive returns.

3. *Constitutional Arguments in Favor of Market-Based Pricing*

The Supreme Court's takings jurisprudence provides another reason for requiring that any FCC-imposed access be priced at market value. The issues are the clearest with respect to DSL. Although the D.C. Circuit vacated the regulations providing that the high frequency portion of the loop constituted a network element subject to unbundled access under the 1996 Act, it left intact the regulations giving telecommunications carriers the right to physically collocate DSLAMs and other routing equipment on the incumbent LEC's property.⁷¹⁵ It seems clear that such a requirement constitutes the type of permanent physical occupation held to constitute a per se taking in *Loretto*.⁷¹⁶

Lower court precedent supports this conclusion as well. In *GTE Northwest, Inc. v. Public Utility Commission*,⁷¹⁷ GTE challenged a state regulatory provision similar to the ONA regime created by the FCC in *Computer III*. The key difference, however, was that Oregon's regime required local telephone companies to permit ESPs to physically collocate on their property.⁷¹⁸ After reviewing the relevant takings analysis contained in *Loretto*, *FCC v. Florida Power Corp.*,⁷¹⁹ and *Yee v. City of Escondido*,⁷²⁰ the court concluded that the physical collocation requirement was properly characterized as the type of permanent physical invasion held to be a per se taking in *Loretto*.⁷²¹ In so holding, the

⁷¹⁴ See *supra* notes 27, 322–35 and accompanying text.

⁷¹⁵ See *United States Telecom Ass'n v. FCC*, 290 F.3d 415, 428–29 (D.C. Cir. 2002); *supra* notes 650–55 and accompanying text.

⁷¹⁶ See *supra* Part II.A.2.

⁷¹⁷ 900 P.2d 495 (Or. 1995). The litigants in *GTE Northwest* framed their challenge in terms of both the Takings Clause and the corresponding provision of the Oregon Constitution. The court assumed without deciding that the analysis would be the same under either provision. See *id.* at 501 n.6; see also *supra* notes 627–28 and accompanying text (describing ONA).

⁷¹⁸ See OR. ADMIN. R. 860-035-0110 (2002); see also *supra* text accompanying note 635.

⁷¹⁹ 480 U.S. 245 (1987); see *supra* Part II.A.3.

⁷²⁰ 503 U.S. 519 (1992).

⁷²¹ See *GTE Northwest*, 900 P.2d at 502–04.

court rejected the argument that the prior restrictions on the telephone company's ability to use its property deprived the company of any "historically rooted expectation of compensation."⁷²² As the court reasoned, "the facts that an industry is heavily regulated, and that a property owner acquired the property knowing that it is heavily regulated, do not diminish a physical invasion to something less than a taking."⁷²³ The court also rejected the argument that physical collocation represented nothing more than a restriction on the use of property that was more properly analyzed as a regulatory taking.⁷²⁴ Furthermore, according to the court, the PUC lacked the statutory authority to exercise the power of eminent domain. As a result, the Oregon Supreme Court invalidated the PUC's collocation regulations as beyond the PUC's statutory authority.⁷²⁵

The analysis with respect to cable modem systems is slightly more ambiguous. Unless it mandates multiple ISP access as a general matter, the FCC need not address precisely how and where the interconnection needed for multiple ISP access should occur or how such access should be priced.⁷²⁶ None of the municipal ordinances requiring multiple ISP access sets forth parameters for interconnection or pricing guidelines, and no consensus has emerged among industry participants as to where the interconnection needed for multiple ISP access should occur.⁷²⁷ Accordingly, the only operative multiple ISP

⁷²² *Id.* at 504.

⁷²³ *Id.*

⁷²⁴ *See id.* at 505–06.

⁷²⁵ *Id.* at 499–501. Note that provisions of the Telecommunications Act of 1996 explicitly give state public utility commissions the right to enforce physical collocation provisions. 47 U.S.C. §§ 251(c)(6), 252 (2000). *See generally* Philip J. Weiser, *Towards a Constitutional Architecture for Cooperative Federalism*, 79 N.C. L. REV. 663, 676–77 (2001) ("Under the Telecom Act, state agencies like the Oregon PUC have mandated physical collocation and other measures that the agencies would not be otherwise authorized to do under state law."). Although this effectively overturned the Oregon Supreme Court's holding with respect to the PUC's authority to enforce physical collocation, it did not in any way undercut the court's conclusion that the physical collocation provisions of the Oregon regulatory scheme constituted a per se taking under *Loretto*.

⁷²⁶ *See* LATHEN, *supra* note 612, at 36.

⁷²⁷ *Id.* at 38–39. Most of these ordinances simply required that cable modem systems provide nondiscriminatory access by allowing unaffiliated ISPs to obtain carriage on the same terms as affiliated ISPs. Although the ordinances in question failed to address the point, such schemes generally require elaborate accounting and nonaccounting rules to ensure that the terms of the access agreements with affiliated ISPs does not include any cross subsidies. *See id.* at 38 (citing Implementation of Non-Accounting Safeguards of Sections 271 and 272 of Communications Act of 1934, as Amended, First Report and Order and Further Notice of Proposed Rulemaking, 11 F.C.C.R. 21905 (1996); Implementation of Telecommunications Act of 1996: Accounting Safeguards Under Telecommunications Act of 1996, Report and Order, 11 F.C.C.R. 17539 (1996)). Thus, contrary to the suggestion of some advocates of multiple ISP access, *see, e.g.*, Jim Chen, *The Authority to Regulate Broadband Internet Access over Cable*, 16 BERKELEY TECH. L.J. 677, 716 (2001), it is likely that any such scheme would require a significant degree of public utility regulation.

access requirements are those imposed as part of the regulatory approval of the AOL-Time Warner merger, which gives certain unaffiliated ISPs the right to interconnect at the same points as AOL Time Warner's proprietary ISPs.⁷²⁸ As a result, contrary to the suggestion of some scholars,⁷²⁹ multiple ISP access to cable modem systems will likely require the type of permanent physical invasion held to constitute a *per se* taking. Consequently, cable modem system operators who are subjected to multiple ISP access requirements would be entitled to fair-market value as compensation. As noted in the discussion regarding access to DSL networks, the proliferation of technological alternatives is in the process of greatly simplifying such a determination.⁷³⁰

CONCLUSION

There can be little question that compelling access to networks has tremendous intuitive appeal as a potential regulatory response to the growing influence of network technologies. Such compulsion would seem to increase the number of options presented to consumers and would appear to offer the prospect of lowering the prices at which network services are available. It goes without saying, however, that there is no free lunch—every regulatory effort that seeks to promote the availability of any particular good necessarily carries costs. Specifically, direct government intervention in establishing access rates all too often fosters allocative inefficiency by interfering with the mechanism through which consumers of network access calibrate their overall level of purchases. Interference with market pricing simultaneously causes secondary distortions in the markets for substitute inputs by making the regulated input seem artificially attractive. These effects create further inefficiencies in the production decisions of entrants and incumbent firms by distorting their mix of productive inputs.

What is less obvious, but no less important, is how government regulation of access pricing can impede dynamic efficiency. Market

⁷²⁸ See *supra* notes 682–85 and accompanying text. The multiple ISP access scheme mandated by the FTC originally anticipated that the unaffiliated ISPs would place their own routing and backbone access facilities within the cable headend in a manner that closely resembled physical collocation. As actually implemented, however, multiple ISP access bears a greater resemblance to virtual collocation, with all of the traffic exiting the headend via AOL's backbone and interconnecting with the unaffiliated ISP's network at some location outside the headend. As we have argued earlier in this Article, this shift does not take the access regime outside the realm of physical takings, because multiple ISP access would still require every cable modem system operator to permit unaffiliated ISPs to establish a physical connection to its network. See *supra* notes 481–90 and accompanying text.

⁷²⁹ See, e.g., Chen, *supra* note 727, at 716.

⁷³⁰ See *supra* note 707 and accompanying text.

prices play a critical role in encouraging firms who need access to telecommunications networks to make the financial commitments necessary to deploy alternative network technologies. Compelling access at below-market rates only serves to dampen the price signal that normally would stimulate investment in additional network capacity. In addition, by precluding these firms from having to make such investments, compelled access starves firms seeking to deploy substitute technologies of the financial resources they need to support the buildout of their networks. The arguments that networks are unique economic phenomena, to which ordinary economic analysis does not apply, simply do not withstand scrutiny.

Given the economic support for basing access rates on market pricing, it should come as little surprise that the Supreme Court's takings jurisprudence supports the same conclusion. Policy makers and the courts have sanctioned the use of cost-based rather than market-based rates only because the initial lack of competition among different network facilities rendered market-based pricing of network access impossible. The emergence of technological alternatives capable of serving as substitutes and the overarching shift in regulatory policy from rate regulation to access regulation have called into question the justifications for failing to base access rates on market prices. Indeed, our discussion of the current status of local telephone networks, utility pole networks, and wireline broadband networks identifies the ways in which technology now provides the external benchmarks needed to support market-based access pricing. Of course, sufficient competition in the provision of network services eventually would suggest regulatory forbearance in setting access rates and compelling access, with reliance instead on markets both for pricing of network services and for assuring the provision of access.

Of course numerous technical obstacles to implementing such a solution remain. Many of the technologies to which we refer are only now in the process of being deployed, and if previous policy making in other technologies is any guide, numerous technical and accounting-related difficulties doubtless still exist. Nonetheless, the economic and constitutional validity of market-based pricing of access to networks should be sufficient to overcome these administrative costs. Market-based rates correctly identify both the economic costs and the just compensation for takings in the "age of access."