

HOW DOES THE EXPERIENCE OF U.S. TELECOMMUNICATIONS
REGULATION INFORM THE FORCED SHARING OF
INTELLECTUAL PROPERTY RIGHTS UNDER
GLOBAL COMPETITION LAW?

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ABSTRACT

Competition authorities in foreign jurisdictions have recently adopted or are considering guidelines on applying competition law to intellectual property rights (IPR). A common concern that certain exercises of IPR can restrict competition underlies IPR provisions that would enable competition authorities to compel holders of IPR to license their IP at regulated royalties. The experience of telecommunications regulation in the United States, from the AT&T divestiture in the early 1980s to the implementation of the Telecommunications Act of 1996, illustrates the potential harm to competition and innovation that such forced-sharing policies would cause. The AT&T divestiture was a costly exercise that prevented or delayed the introduction of new services. Forced sharing of incumbents' network elements at regulated rates under the Telecommunications Act reduced investment by both incumbents and entrants. Ironically (yet predictably), the competition for local telephone service that the Act sought but failed to foster was provided by wireless and cable operators, which were deliberately left unregulated and thus had both the incentive and means to upgrade and expand their networks to handle mass volumes of voice and data communications. The failure of forced sharing to promote competition and innovation counsels competition authorities to proceed with caution when using competition law to regulate IPR.

JEL: D23; D45; K11; K21; L10; L40; L51; L96; O34; O38

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I. INTRODUCTION

Some antitrust enforcement agencies, particularly those in rapidly growing economies, have suggested that it would benefit competition to compel the owner of a valuable patent to license it at non-market-based fees set or approved by the government, or to prohibit the integration of diverse functionalities into a single product (for example, a computer chip). More broadly, the threat exists that domestic competition law in these nations will be used to create an expansive version of the “essential facilities doctrine”¹ that would be applied not only to tangible property, but to intangible intellectual property rights (IPR). The essential facilities doctrine provides that a monopolist’s refusal to deal may be unlawful because the “monopolist’s control of an essential facility (sometimes called a ‘bottleneck’) can extend monopoly power from one stage of production to another, and from one market into another.”² Although IPR guidelines may not explicitly refer to the essential facilities doctrine, the logic behind application of competition law to IPR is the same as that of the essential facilities doctrine. For example, the IPR guidelines of the Korea Fair Trade Commission (KFTC) establish that “[c]ompetition in the relevant market is likely to be limited . . . when the intellectual property is recognized as powerful technology such as an essential element necessary for production.”³

The lessons learned in the United States from 1984 to 2010 from the AT&T divestiture, its aftermath, and the experience with the implementation of the

1. For the development of the essential facilities doctrine in U.S. antitrust law, see *United States v. Terminal R.R. Ass’n*, 224 U.S. 338 (1912); *Associated Press v. United States*, 326 U.S. 1 (1945); *MCI Commc’ns Corp. v. Am. Tel. & Tel. Co.*, 708 F.2d 1081 (7th Cir. 1982); *Gamco, Inc. v. Providence Fruit & Produce Bldg., Inc.*, 194 F.2d 484 (1st Cir. 1952). For legal and economic analysis of the essential facilities doctrine, see Abbott B. Lipsky, Jr. & J. Gregory Sidak, *Essential Facilities*, 51 STAN. L. REV. 1185 (1999). The Supreme Court reiterated in 2004 that it has never embraced the doctrine. *Verizon Commc’ns Inc. v. Law Offices of Curtis V. Trinko, LLP*, 540 U.S. 398, 410-11 (2004).

2. *MCI*, 708 F.2d at 1132. U.S. courts require four conditions to be satisfied to establish liability under the essential facilities doctrine: “(1) control of the essential facility by a monopolist; (2) a competitor’s inability practically or reasonably to duplicate the essential facility; (3) the denial of the use of the facility to a competitor; and (4) the feasibility of providing the facility.” *Id.* at 1132-33 (citing *Hecht v. Pro-Football, Inc.*, 570 F.2d 982, 992-93 (D.C. Cir. 1977); *Otter Tail Power Co. v. United States*, 410 U.S. 366 (1973); *Terminal R.R.*, 224 U.S. at 405, 409; *City of Mishawaka v. Am. Elec. Power Co.*, 465 F. Supp. 1320, 1336 (N.D. Ind. 1979)).

3. Review Guidelines on Undue Exercise of Intellectual Property Rights (amended by Korea Fair Trade Comm’n, Mar. 30, 2010, effective Apr. 7, 2010), at 7 (translation) [hereinafter KFTC Guidelines on IPR 2010].

Telecommunications Act of 1996⁴ are highly relevant to other nations that are currently developing competition law principles concerning rights to intellectual property and other valuable assets owned by successful businesses. The breakup of AT&T reflected a distrust of product integration (local and long-distance telephony), particularly when the integrated products use a common asset or interface (that is, wireline “loops” connecting customer premises to the “public switched network,” which are used to place and receive “long distance” in addition to “local” calls). Later, the Telecommunications Act reflected a belief that government-mandated access to local telephone networks at regulated prices was both administratively feasible and a necessary condition for competition to develop in local telecommunications services.⁵ Congress and the Federal Communications Commission (FCC) were not content to wait for the combination of market forces and technological developments to direct private investment decisions and render feasible facilities-based competition for local telephony.

The IPR guidelines recently adopted or currently under consideration in the EU, Korea, and China share with the AT&T divestiture and the Telecommunications Act a common concern over firms using market power over essential inputs to restrict competition in other markets. In the context of IPR, the European Commission’s Guidelines on the Applicability of Article 101 of the Treaty on the Functioning of the European Union to Horizontal Cooperation Agreements—known more succinctly as the Horizontal Cooperation Guidelines (HCG)—principally concerns IPR in the context of standard setting.⁶ The KFTC’s Guidelines on Undue Exercise of Intellectual Property Rights principally concerns the notion of “unfair” licensing practices,⁷ which the KFTC believes would violate Korea’s Monopoly Regulation and Fair Trade Act (MRFTA).⁸ Under draft Guidelines for Anti-Monopoly Law Enforcement in the Area of Intellectual Property Rights,⁹ refusals to license, cross-licensing, tying, and other restrictive licensing practices would violate China’s Anti-Monopoly Law (AML)¹⁰ when those practices are found to restrict competition.¹¹ The final or draft IPR guidelines of the EU, Korea, and China each state that competition law

4. Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 56 (1996).

5. I will use the term “regulated rates” to connote either rates established by government agencies or rates established by the property owner but subject to review and revision based on principles and benchmarks developed or approved by government agencies.

6. Guidelines on the Applicability of Article 101 of the Treaty on the Functioning of the European Union to Horizontal Co-operation Agreements 9274/2, 2011 O.J. (C 11) ¶ 269 [hereinafter HCG 2011].

7. KFTC Guidelines on IPR 2010, *supra* note 3.

8. Monopoly Regulation and Fair Trade Act (amended by Law No. 8631, Aug. 3, 2007), Korea Fair Trade Comm’n (translation).

9. Guidelines for Anti-Monopoly Law Enforcement in the Area of Intellectual Property Rights (Third Draft Revision), art. 3 (P.R.C.) (translation) [hereinafter China IPR Guidelines]. As of this writing, the Third Draft Revision has not been adopted. I understand that Chinese enforcement agencies may be working on a new or replacement draft.

10. Anti-Monopoly Law of the People’s Republic of China (promulgated by Standing Comm. Nat’l People’s Cong., Aug. 30, 2007, effective Aug. 1, 2008) (translation).

11. China IPR Guidelines, *supra* note 9. An IPR holder’s use of its IPR to “eliminate or restrict competition constitutes a monopoly agreement, abuse of a dominant market position and/or a concentration that eliminates or restricts competition” that will be subject to China’s Anti-Monopoly Law. *Id.* art. 3.

and IPR protection pursue the common objective of promoting innovation.¹² They all have no presumption of market power for IPR holders.¹³ However, although they all recognize that refusing to license is a core right created by patent law, the IPR guidelines reflect the view that competition law agencies may and should eliminate or limit that right based on their assessment of its effect on competition. Such an open-ended policy would profoundly diminish incentives to engage in costly and risky R&D by denying inventors and their investors confidence that they will be permitted to collect whatever fees the market will bear if their efforts are successful.

The U.S. telecommunications experience counsels other nations to proceed cautiously when applying competition law to prohibit product integration by successful enterprises, or to require the sharing of IPR or other valuable property at rates mandated or approved by government. The AT&T divestiture generated substantial costs and inefficiencies. Any slight increase in competition in long-distance services came at a huge cost. The divestiture certainly did not advance competition in local telephony. Consumer demand for bundled long-distance and local services (prohibited by divestiture), along with the enormous costs of maintaining divestiture regulations, drove Congress to enact the Telecommunications Act of 1996.

The new legislation (1) eliminated state and local laws prohibiting local competition;¹⁴ (2) compelled the incumbent local telephone companies (the largest of which were the former AT&T affiliates, the Bell operating companies (BOCs)) to lease (“unbundle”¹⁵) their local networks to competitors at “reasonable and nondiscriminatory” rates subject to regulatory approval;¹⁶ and (3) upon compliance with those leasing obligations, authorized the BOCs to provide long-distance service. The forced-sharing provisions for incumbent wireline networks were a policy failure that consumed billions of dollars in implementation and administration costs, that discouraged investment in facilities by the Bell companies and new entrants alike, and that created virtually no meaningful or enduring local competition.¹⁷ Instead, technological innovation and local telephone competition came from wireless and cable television, which—not coincidentally—were deregulated or unregulated. Due to the absence of regulation compelling sharing of property at rates set by government agencies, wireless and cable television providers had both the means and incentive to invest heavily to increase the speeds of their networks and, in the case of cable, to make the network bidirectional so as to support voice, internet, and voice-over-internet services.

12. See, e.g., HCG 2011, *supra* note 6, ¶ 269 (“Intellectual property laws and competition laws share the same objectives of promoting innovation and enhancing consumer welfare.”).

13. HCG 2011, *supra* note 6, ¶ 269; China IPR Guidelines, *supra* note 9, art. 17.

14. 47 U.S.C. § 253(a) (“No State or local statute or regulation, or other State or local legal requirement, may prohibit or have the effect of prohibiting the ability of any entity to provide any interstate or intrastate telecommunications service.”).

15. “Unbundling” is a term of art referring to the forced-sharing provisions of the Telecommunications Act of 1996. I treat the terms “unbundling” and “sharing” as synonymous in this article.

16. The U.S. regulators responsible for devising and implementing the methodology by which to determine the reasonableness of these rates succumbed to the natural temptation to favor low rates for unbundled network elements in the short term at the cost of depressing incentives for investment in new or alternative facilities. The rates were actually below the costs of the leased facilities.

17. See J. Gregory Sidak, *The Failure of Good Intentions: The WorldCom Fraud and the Collapse of American Telecommunications After Deregulation*, 20 YALE J. ON REG. 207 (2003).

This sixteen-year experiment in regulatory intervention into wireline telecommunications from 1984 to 2010 showed that technological advances that depend on market incentives for innovation generate more robust competition than do incentive-stifling sharing requirements. That lesson demonstrates that markets are better suited than government interventions to create and maintain competition. It is doubtful, for example, that the technologies essential to the advancement of the wireless industry and to the provision of telecommunications services over cable television networks—the real sources of local competition—would have developed as rapidly, if at all, had the government set license fees to ensure equivalent market outcomes among rivals and short-term reductions in retail prices.

In Part II, I explain the implications of the AT&T divestiture for competition policy that would restrict product integration. The antitrust consent decree that broke up the Bell System, known as the Modification of Final Judgment (MFJ), required AT&T to divest its local networks from its long-distance operations.¹⁸ The separation of the MFJ rested on the concern that the Bell operating companies would use their purported market power over local networks to suppress competition in long-distance, manufacturing, and information services. The legal barriers to the BOCs' supplying of downstream services caused substantial delay in their ability to introduce new services, and prevented them from offering consumers the efficiency of obtaining and receiving all of their telephone service from a single company. Economists have estimated the reduction in consumer surplus resulting from the delay alone to be in the billions of dollars. Particularly in the high-technology industries in which many IPR holders operate, dynamic competition should mitigate competition authorities' similar concerns, which in any event are outweighed by the impact on innovation of restrictions on product integration and the exercise of core rights to intellectual property.

In Part III, I explain how the U.S. experience of forced sharing under the Telecommunications Act of 1996 suggests the probable consequences of competition law policies that would mandate that holders of essential patents license their IP at regulated rates. Forced sharing was intended to promote investment and facilitate competition in telecommunications. However, the FCC's pricing rules for incumbent telephone companies to lease their network elements to competing telephone companies¹⁹ distorted the incentives of both incumbents and entrants. In a voluntary, bilateral negotiation occurring in an unregulated market, a firm will willingly sell (or lease or license) a valuable asset to another firm if the price reflects the seller's opportunity costs of that asset. In this respect, voluntary exchange preserves a firm's incentives to invest in new goods. Because the FCC's pricing rules, which were based on the novel concept of "total element long-run incremental cost" (TELRIC), did not allow

18. Modification of Final Judgment, *reprinted in* United States v. American Tel. & Tel. Co., 552 F. Supp. 131, 226-34 (D.D.C. 1982), *aff'd sub nom.* Maryland v. United States, 460 U.S. 1001 (1983). The settlement was a "modification" of an earlier "final judgment" in the sense that it modified a consent decree into which AT&T and the government had entered in 1956. The divestiture, through its line-of-business restrictions, can be seen as a type of restriction on product integration.

19. The legal terms of art when referring to incumbent telephone companies and competing telephone companies are incumbent exchange carriers (ILECs) and competing exchange carriers (CLECs). I use the terms incumbent telephone company (or incumbent) and competing telephone company (or entrant) in this article, but my analysis does not depend on the label for the incumbents and entrants.

incumbents to recover their historical costs, much less their full opportunity costs of leasing their network elements to rivals, forced sharing reduced incumbents' investment incentives. Empirical evidence shows that incumbents decreased capital investments in network infrastructure during the regime of forced sharing. At the same time, because forced sharing enabled entrants to receive access to valuable infrastructure at below-market prices, those entrants increasingly relied on the incumbents' unbundled networks as their mode of entry instead of investing in construction of their own networks.

Analogous provisions under global competition law that would mandate licensing of IPR at regulated royalties would similarly prevent IPR holders from recovering their opportunity costs of licensing their patents. Firms would consequently reduce their investments in valuable inventions. Moreover, the added potential for IPR holders to face antitrust penalties would exacerbate that outcome. The failure of forced sharing under the Telecommunications Act of 1996 underscores the difficulties of relying on government intervention to replicate competitive outcomes. Using competition law to regulate IPR licensing and royalties would likely cause even greater harm to innovation and consumer welfare than did the forced sharing of telecommunications networks at regulated prices.

II. THE AT&T DIVESTITURE

Before 1984, most consumers and businesses in the United States received their wireline telephone service from AT&T and its subsidiaries, collectively known as the "Bell System." The Bell System's customers used its network to place and receive "long-distance" as well as "local" calls.

The modern era in U.S. telecommunications policy began in 1984, when the U.S. Department of Justice (DOJ) broke up AT&T pursuant to the settlement of an antitrust suit that the DOJ had filed a decade earlier. The terms of the settlement were reflected in a court order entitled the "Modification of Final Judgment" (MFJ). The MFJ required AT&T to divest its subsidiaries, the Bell Operating Companies (BOCs), that provided long-distance service, and forbade the BOCs from, *inter alia*, providing long-distance service. The court-imposed divestiture was very costly to implement and oversee, prevented the introduction or increased the cost of new BOC services, and denied consumers the efficiencies of obtaining all of their telecommunication services from a single carrier.

A. The Reasons for and Consequences of the Divestiture

The FCC made numerous attempts throughout the 1970s to promote competition in the U.S. telecommunications industry. Congress, meanwhile, failed in its attempts to modernize the basic telecommunications legislation of 1934. Telecommunications policy subsequently moved from the regulatory and legislative arenas to the federal judiciary with the implementation of the MFJ. A federal district court judge administered the MFJ until Congress passed the Telecommunication Act of 1996, which ended the MFJ.²⁰

20. A particularly insightful economic analysis of the AT&T breakup and the MFJ is PAUL W. MACAVOY, *THE FAILURE OF ANTITRUST AND REGULATION TO ESTABLISH COMPETITION IN LONG-*

Before the MFJ required divestiture, the AT&T had consisted of three main parts: (1) local subsidiaries (for example, New York Telephone), which provided about 80 percent of local telephone service in the United States; (2) AT&T Long Lines, which provided almost all domestic and international long-distance service in the United States; and (3) Western Electric, including Bell Laboratories, which provided most of the telecommunications equipment for AT&T's local and long-distance businesses. After the divestiture, AT&T continued to operate the long-distance and manufacturing units, while the local companies were divested and organized into seven independent Regional Bell Operating Companies (RBOCs). The RBOCs generally were comprised of subsidiaries with operations limited to a specific state, or a portion thereof.

The rationale for the MFJ was the "quarantine theory."²¹ Before divestiture, the local companies were thought to have market power due to a "natural monopoly," despite the fact that they were regulated at both the state and federal level to limit the exercise of any such market power. A given production technology exhibits the property of natural monopoly if a single firm can supply the market at lower cost than can two or more firms.²² If the technology of local telephony exhibits natural monopoly characteristics, then a single firm can construct and operate the network at a lower cost than can two or more firms. The quarantine theory suggested that, in the absence of the entry restriction, the BOCs would cross-subsidize competitive local toll services with revenues from their monopolized local services and, further, would discriminate against competing long-distance companies when providing the connection to the local network.

Events also soon demonstrated that a district judge had only limited ability to oversee telecommunications policy in the United States. The technology of telecommunications was changing rapidly in the 1980s and 1990s with the introduction of digital computer-driven switches and fiber-optic transmission, but the court's evidentiary record contained outdated information primarily from 1976. The use of services utilizing these facilities and technologies became widespread in France with Minitel, but the United States remained far behind.

The MFJ contained a waiver procedure by which the BOCs would request relief from the MFJ for specific services so long as "there [was] no substantial possibility that the [petitioning BOC] could use its monopoly power to impede competition in the market it seeks to enter."²³ However, the MFJ's waiver process became mired in legal delay, impeding the evolution of efficient new technologies. In 1993, the average waiver request had been pending for 36 months, despite the fact that the Department of Justice had opposed relief in only six of the

DISTANCE TELEPHONE SERVICE (AEI Press 1996). The definitive analysis of the legal administration of the MFJ is MICHAEL K. KELLOGG, JOHN THORNE & PETER W. HUBER, *FEDERAL TELECOMMUNICATIONS LAW* 199-248 (Little, Brown & Co. 1992).

21. See J. GREGORY SIDAK & DANIEL F. SPULBER, *DEREGULATORY TAKINGS AND THE REGULATORY CONTRACT: THE COMPETITIVE TRANSFORMATION OF NETWORK INDUSTRIES IN THE UNITED STATES* 55-99 (Cambridge Univ. Press 1999); WILLIAM J. BAUMOL & J. GREGORY SIDAK, *TOWARD COMPETITION IN LOCAL TELEPHONY* 130 (MIT Press 1994).

22. See, e.g., DENNIS W. CARLTON & JEFFREY M. PERLOFF, *MODERN INDUSTRIAL ORGANIZATION* 101-03 (2d ed., Addison-Wesley 2000); KENNETH E. TRAIN, *OPTIMAL REGULATION: THE ECONOMIC THEORY OF NATURAL MONOPOLY* 6-8 (MIT Press 1991); DANIEL F. SPULBER, *REGULATION AND MARKETS* 3 (MIT Press 1989).

23. Modification of Final Judgment, § VIII.C., 552 F. Supp. at 231.

266 waiver requests filed by the RBOCs.²⁴ By the end of 1993, the average age of pending waiver motions before the district court had grown to 54.7 months,²⁵ despite the fact that the decree court had fully approved 96 percent of all waiver requests filed.²⁶

The parties had agreed to a triennial review of the MFJ, and the first such review began in 1987. This review led to the removal of the MFJ's prohibition on the provision of information services by the BOCs. However, because of various appeals to the U.S. Court of Appeals for the D.C. Circuit and subsequent remands to the district court, the first triennial review was not completed by either 1990 or 1993, when the *second* and *third* reviews were scheduled to take place. Indeed, a second triennial review *never* took place.

The MFJ significantly harmed consumers. Empirical research has found that the line-of-business restrictions in the MFJ caused consumers to forgo billions of dollars of consumer surplus annually because of the delay in introducing new telecommunications services.²⁷ In response to a stream of complaints increasing in both frequency and intensity, Congress finally passed the Telecommunications Act of 1996, which overhauled the Communications Act of 1934 and ended the MFJ.

B. The Larger Economic Lesson from the Divestiture: Consumer Losses from Delayed Product Integration and Delayed Introduction of New Goods

One can estimate the cost of delayed introduction of a new good by measuring the consumer surplus that consumers would have had if the service had been available during the period of delay. Consumer surplus reflects the benefit realized by consumers from consumption of a good or service; it is the difference between a consumer's willingness to pay for a good and the good's market price. That is, when a consumer pays \$10 for a good for which he is willing to pay \$15, the consumer realizes a surplus of \$5. Economists routinely use consumer surplus to measure consumer welfare.²⁸

The introduction of new technologies and new goods and services, when successful, leads to large gains in consumer surplus. Conversely, delays in the introduction of a new good can cause large losses in consumer surplus relative to what otherwise would have been attainable. The intuition underlying the economic approach to valuing a new good or service is that, until this good or service actually comes to market, consumers are unable to purchase it *at any price*, no matter how much consumers would like to buy it. Thus, in some sense, the "virtual price" of the new good or service that is unavailable might as well be infinite.²⁹

24. See Paul H. Rubin & Hashem Dezhbakhsh, *Costs of Delay and Rent-Seeking Under the Modification of Final Judgment*, 16 *MANAGERIAL & DECISION ECON.* 385, 385-87 (1995).

25. See *id.* at 392.

26. See *id.* at 389, 392.

27. See Jerry A. Hausman, *Valuing the Effect of Regulation on New Services in Telecommunications*, 1997 *BROOKINGS PAPERS ON ECON. ACTIVITY: MICROECONOMICS* 1, 13-24.

28. See, e.g., PAUL A. SAMUELSON & WILLIAM D. NORDHAUS, *ECONOMICS* 91-93 (16th ed., McGraw-Hill Cos., Inc. 1998).

29. For an application of this analysis, see Jerry A. Hausman & J. Gregory Sidak, *Google and the Proper Antitrust Scrutiny of Orphan Books*, 5 *J. COMPETITION L. & ECON.* 411, 414-18 (2009).

For example, AT&T initially proposed to offer voice-messaging services in the late 1970s, before the breakup of the Bell System. The FCC first delayed its decision and then refused to allow the BOCs to offer voice-messaging services on an integrated basis with the rest of their telecommunications services. In 1986, the FCC reversed its decision. By then, however, the AT&T divestiture decree had established line-of-business restrictions that forbade the BOCs to offer (among other services) voice-messaging services. Two years later, in 1988, the MFJ court vacated the line-of-business restriction on information services (which included voice-messaging services), and the BOCs began to offer the services in 1989, more than *ten* years after AT&T first proposed to offer them. The services have been widely available since 1990, and about 16 million consumers bought them in 1996. If, as Jerry Hausman has estimated, the consumer surplus from these services was \$1.27 billion in 1994 alone,³⁰ then the decade of regulatory delay cost consumers many billions of dollars. Relative to the consumer-surplus losses from the delay in the introduction of voice messaging, one would expect similarly large losses in consumer surplus when other regulations delay the introduction of new or improved technologies, products, and services.

III. THE RAMIFICATIONS OF FORCED SHARING OF VALUABLE ASSETS AT REGULATED RATES: THE U.S. TELECOMMUNICATIONS ACT OF 1996

Competition law agencies in several jurisdictions have adopted or are considering regulations that would enable them to compel the licensing of patented technology and to review and invalidate license fees they deem to be “unreasonable.”³¹ Proponents of these regulations have argued that they would help ensure that prices for products and services that use the technology are affordable. Opponents contend that the regulations would stifle incentives to invest in risk R&D and seriously diminish innovation. Thus far, the debate has been conducted strictly on a theoretical level; neither side has offered any real-world evidence to support its argument. But such evidence does in fact exist. The U.S. experience of forced sharing under the Telecommunications Act of 1996 illustrates the potential harm that consumers and IPR-holders would suffer if competition authorities were to compel IPR licensing and regulate royalties.

The sharing provisions of the 1996 Telecommunications Act were intended to promote facilities-based competition and innovation. However, forced sharing deterred investment and proved to be unnecessary for the realization of facilities-based competition in telecommunications. The FCC’s pricing rules for incumbents to lease their unbundled network elements (UNEs) to entrants did not allow incumbents to recover their full opportunity cost of leasing their infrastructure to competitors, including the incumbents’ sunk investments. If

30. Hausman, *Valuing the Effect of Regulation on New Services in Telecommunications*, *supra* note 27, at 2. See also Jerry A. Hausman, *Valuation of New Goods Under Perfect and Imperfect Competition*, in *THE ECONOMICS OF NEW GOODS* 209 (Timothy F. Bresnahan & Robert J. Gordon eds., Univ. of Chicago Press 1997); Jerry A. Hausman, *Sources of Bias and Solutions to Bias in the CPI*, 17 *J. ECON. PERSP.* 23 (2003); Jerry A. Hausman, *Mobile Telephone*, in *HANDBOOK OF TELECOMMUNICATIONS ECONOMICS* 585 (Martin E. Cave, Ingo Vogelsang & Sumit K. Majumdar eds., North Holland 2002).

31. See, e.g., KFTC Guidelines on IPR 2010, *supra* note 3, at 9; China IPR Guidelines, *supra* note 9, art. 25; HCG 2011, *supra* note 6, ¶ 287.

global competition laws were similarly to compel IPR holders to license their intellectual property at below-cost rates, IPR-holders and would-be IPR holders would have diminished incentives to invest in new technologies, particularly in essential or valuable technologies that are most likely to create substantial gains in consumer surplus. The form of the property at issue, tangible in the case of the Telecommunications Act and intangible in the case of IPR sharing regulations, in no way diminishes the relevance of the former to consideration of the latter.

A. The Parallels Between the U.S. Telecommunications Act of 1996 and Global IPR Licensing Policies

The provisions of the U.S. Telecommunications Act of 1996 that are relevant to the question of forced sharing of IPR at regulated royalties are sections 251 and 252 of the Communications Act, added by the Telecommunications Act of 1996. Sections 251 and 252 were the core provisions by which Congress sought to open local telephone markets to competition.³² Those two sections required incumbent wireline local telecommunications companies (for example, Pacific Bell) to lease their local networks or portions thereof (so-called “network elements”) to long-distance and other companies (for example, AT&T) seeking to enter the local telecommunications market, all of which lacked the network facilities to provide local telecommunications service. The Telecommunications Act of 1996 required incumbents to share their network elements in return for “reasonable” fees. This regulatory model of entry was known as “unbundled access,” but it amounted to forced sharing of property.

Sections 251 and 252 provided a skeleton for the pricing of network elements by the incumbents to their competitors. If the competitor and the incumbent could not negotiate mutually acceptable prices and terms, then the Telecommunications Act directed the state public utilities commission (PUC) to resolve the dispute through (binding) compulsory arbitration.³³ Entrants and incumbents were unable to reach any voluntary agreements on the pricing of network elements. As a consequence, literally *hundreds* of arbitration proceedings began in the fall of 1996. Incumbents had the duty

to provide, to any requesting telecommunications carrier for the provision of a telecommunications service, nondiscriminatory access to network elements on an unbundled basis at any technically feasible point on rates, terms, and conditions that are just, reasonable, and nondiscriminatory in accordance with the terms and conditions of the agreement[.]³⁴

The parallels between the “network elements” provisions of the U.S. Telecommunications Act of 1996 and the IPR Guidelines adopted recently in Europe, Korea, and other jurisdictions are striking. Like owners of patents that are essential to *successful* standards, the incumbents’ local networks were deemed essential to the provision of competing local telephone service.³⁵

32. 47 U.S.C. §§ 251, 252.

33. *Id.* § 252(b).

34. *Id.* § 251(c)(3).

35. There has been no finding in any case worldwide that ownership of a patent essential to a successful standard does not confer market power.

The Telecommunications Act and some IPR guidelines have both justified forced sharing of essential inputs as necessary to promote downstream competition and lower retail prices.³⁶ Like IPR sharing regulations, the 1996 Telecommunications Act required the incumbent local telephone companies to permit other firms to use their property—for example, the wires or “local loops” connecting phone company switches with customer premises—to promote competition downstream and lower retail prices.

Analogous to commitments governing the licensing of essential patents,³⁷ the Telecommunications Act required that the rates, terms, and conditions applicable to the leasing of the incumbent’s network elements be “just, reasonable, and nondiscriminatory.”³⁸ The FCC’s stated interpretation of “just” terms was “terms and conditions that would provide an efficient competitor with a meaningful opportunity to compete.”³⁹ “[B]y providing interconnection to a competitor in a manner less efficient than an incumbent . . . provides itself,” the FCC stated, the incumbent would violate its “just” and “reasonable” duties.⁴⁰ The European Commission’s HCG defines “fair” as resembling “the licensing fees charged by the company in question for the relevant patents in a competitive environment before the industry has been locked into the standard (*ex ante*).”⁴¹ Whereas the FCC’s definition of “just” pricing implicated a competitor-welfare analysis, the HCG’s definition of “fair” pricing does not presume that the licensor is a competitor of the licensee.

Finally, analogous to the procedures for licensing of essential patents, the Telecommunications Act required that that rates, terms, and conditions applicable to the leasing of the incumbent’s network elements be determined through bilateral negotiations between the parties (that is, the incumbents and new entrants). Both the IPR guidelines and the Telecommunications Act have provided that parties would resolve disputes in arbitration before government agencies or in litigation before civil or commercial courts.⁴² Incumbent local

36. See, e.g., China IPR Guidelines, *supra* note 9, art. 18 (“If, while granting intellectual property licenses to others, a business operator with a dominant market position refuses to grant a license and such refusal is unequal or discriminatory, or the intellectual property that it refuses to license is essential for a licensee to compete in the relevant market and refusing to license the relevant intellectual property makes it impossible for the licensee to compete effectively in the relevant market and could have a negative effect on competition and innovation in the relevant market, the State Council’s anti-monopoly enforcement agency is required to conduct an examination.”); KFTC Guidelines on IPR 2010, *supra* note 3, at 11 (“The act of refusing to grant a license is likely to be determined as unfair . . . when the technology, for which the license was refused, is an essential element in business activities; when it is difficult to secure alternative supply channel for the patented technology; when the technology, like a technical standard, has a great influence on the relevant market; and when the refusal by the patentee to grant a license, despite the patentee not having any intention to work the technology, excessively impedes the use of the technology.”); HCG 2010, *supra* note 6, ¶ 272 (“refusing access to the standard terms could risk causing anti-competitive foreclosure”).

37. See, e.g., HCG 2010, *supra* note 6, ¶ 285.

38. Implementation of the Local Competition Provisions in the Telecommunications Act of 1996; Interconnection between Local Exchange Carriers and Commercial Mobile Radio Service Providers, First Report and Order, 11 F.C.C.R. 15,499 ¶ 26 (1996) [hereinafter First Report and Order].

39. *Id.* ¶ 218.

40. *Id.* The FCC offered as an example that an incumbent “may not provision unbundled elements that are inferior in quality to what the incumbent provides itself because this would likely deny an efficient competitor a meaningful opportunity to compete.” *Id.* ¶ 315.

41. HCG 2010, *supra* note 6, ¶ 289.

42. See *id.* ¶ 291; KFTC Guidelines on IPR 2010, *supra* note 3, at 22; China IPR Guidelines, *supra* note 9, arts. 5 & 7.

telephone companies and entrants resolved disputes before state public utility commissions when negotiations were unsuccessful.

B. The Difficulty of Determining Rates Through Non-Market Transactions

The Telecommunications Act required that network elements be priced at cost, with the possible addition of a reasonable profit.⁴³ Astonishingly, however, the Telecommunications Act provided no definition of cost. In August 1996, the FCC issued a 600-page report and order containing rules for determining these prices.⁴⁴ The agency invented the concept of “total element long-run incremental cost” (TELRIC) and made it the foundation for the rules for pricing mandatory access to unbundled network elements.⁴⁵ The FCC’s rules were based on a model of a hypothetical carrier that places switches in the incumbent’s existing switch locations but otherwise builds an entirely new, state-of-the-art network to serve customer locations: “The total element long-run incremental cost of an element should be measured based on the use of the most efficient telecommunications technology currently available and the lowest cost network configuration, given the existing location of the incumbent LEC’s wire centers.”⁴⁶ The FCC’s stated objective in establishing that rule was to adopt a pricing methodology that “best replicates, to the extent possible, the conditions of a competitive market.”⁴⁷

To say that the FCC’s pricing rules proved to be controversial both in theory and practice would be a gross understatement.⁴⁸ Between 1999 and 2002, the Supreme Court of the United States twice interpreted the rules for forced sharing⁴⁹ and thereafter issued three more decisions—in 2004, 2007, and 2009—construing the relationship of antitrust law to this new regulatory regime.⁵⁰ Much of the technical economic debate has focused on establishing proper cost of capital and depreciation values that reflect the risk facing firms owning

43. 47 U.S.C. § 252(d)(1).

44. First Report and Order, *supra* note 39.

45. In addition to allowing the incumbent to recover its “forward-looking costs directly attributable to the specified element,” TELRIC pricing allowed the incumbent to recover “a reasonable allocation of forward-looking common costs.” *Id.* at ¶ 682. The controversy over the FCC’s method for allocating common costs was its definition of a “reasonable allocation”: “a second reasonable allocation method would allocate only a relatively small share of common costs to certain critical network elements, such as the local loop and collocation, that are most difficult for entrants to replicate promptly (*i.e.*, bottleneck facilities).” *Id.* at ¶ 696. *See also* SIDAK & SPULBER, *supra* note 21, at 339-41.

46. 47 C.F.R. § 51.505(b)(1).

47. *Id.* at ¶ 679.

48. Although the U.S. Supreme Court in 2002 ultimately upheld the FCC’s authority to establish the TELRIC rules, in 2003—seven years after the passage of the Telecommunications Act of 1996—the FCC opened an investigation to reform those rules to (1) make them align more realistically with the underlying costs that telecommunications networks entail and (2) better promote facilities-based competition. *See* Pricing of Unbundled Network Elements and the Resale of Services by Incumbent Local Exchange Carriers, Notice of Proposed Rulemaking, 18 F.C.C.R. 18,945 (2003).

49. AT&T Corp. v. Iowa Utils. Bd., 525 U.S. 366, 368 (1999); Verizon Commc’ns Inc. v. FCC, 535 U.S. 467, 468 (2002). For a detailed critique of the FCC’s pricing of unbundled network elements in the *First Report and Order*, see J. Gregory Sidak & Daniel F. Spulber, *The Tragedy of the Telecommons: Government Pricing of Unbundled Network Elements Under the Telecommunications Act of 1996*, 97 COLUM. L. REV. 1081 (1997).

50. Verizon Commc’ns Inc. v. Law Offices of Curtis V. Trinko, 540 U.S. 398 (2004); Bell Atlantic Corp. v. Twombly, 550 U.S. 544 (2007); Pac. Bell Tel. Co. v. linkLine Commc’n, Inc., 129 S. Ct. 1109 (2009).

substantial amounts of capital assets that become sunk upon deployment.⁵¹ The controversy over TELRIC pricing illustrates the complexity in attempting to have government agencies replicate competitive prices through non-market mechanisms.

1. *Replacement of Bilateral Negotiations with State PUC Proceedings*

The FCC adopted rules in 1996 applying the TELRIC methodology to specific network elements, such as local loops and switches. The FCC's TELRIC pricing rules were quite detailed, but they still did not yield the rates themselves. Moreover, the FCC's rules could not practically address or resolve all issues relevant to rates. Consequently, state PUCs further developed and applied the TELRIC methodology in specific proceedings applicable to the local networks within their jurisdictions. The FCC's adoption of a particular methodology to determine leasing fees destroyed any prospect of meaningful negotiations between incumbents and entrants on the pricing of unbundled network elements. Hundreds of arbitration proceedings began in the fall of 1996. Many state PUCs did not await the failure of negotiations, but immediately commenced proceedings to determine TELRIC rates. Others waited for entrants to request intervention.

Any "negotiations" before or after the state PUC proceeding took the form of haggling over the appropriate values for the various inputs in cost models developed by each party. The state PUCs determined the values of the inputs upon which the incumbent and the entrant could not agree through negotiations, which proved to be the norm. Each side to a PUC proceeding developed and proposed its own cost model and inputs based on testimony of independent experts (economists and network engineers) it had retained for this purpose.⁵² The inputs proposed by each side sometimes varied by orders of magnitude. The state PUCs, comprised of political appointees who were more interested in short-term price cuts that would please voters and other political constituencies than funding the development of new technologies and deployment of new network facilities (whose benefits might not achieve popular recognition until years in the future), almost without exception adopted the cost model inputs that the entrant proposed and rejected the cost models and inputs that the incumbent developed. The results were artificially low rates that reduced the incentives for competitors and incumbents alike to invest in building their own networks and facilities.

TELRIC ended the prospect of voluntary negotiations. It became the norm for CLECs to put forth TELRIC prices, with which ILECs disagreed, and for CLECs then to petition for arbitration. The availability of PUCs to serve as binding arbitrators eliminated the incentive of CLECs to negotiate with ILECs to reach mutually beneficial rates. It is not surprising that the replacement of

51. See Jerry A. Hausman & J. Gregory Sidak, *Did Mandatory Unbundling Achieve Its Purpose? Empirical Evidence from Five Countries*, 1 J. COMPETITION L. & ECON. 173, 195 (2005); Jerry A. Hausman & J. Gregory Sidak, *A Consumer-Welfare Approach to the Mandatory Unbundling of Telecommunications Networks*, 109 YALE L.J. 417, 462-63 (1999); Robert S. Pindyck, *Mandatory Unbundling and Irreversible Investment in Telecom Networks*, 6 REV. NETWORK ECON. 274, 274-75 (2007).

52. The HCG similarly envisions and permits the use of "independent expert assessment of the objective centrality and essentiality" of a patent to an IPR portfolio or standard. HCG 2010, *supra* note 6, ¶ 290.

voluntary negotiations with PUC proceedings led to the inefficient allocation of resources, since the most distinguishing economic characteristic of voluntary agreements is that they are Pareto efficient.⁵³ The complexity of IP negotiations relative to negotiations over leased access to local loops weighs in favor of encouraging voluntary negotiations for licensing terms instead of using competition authorities to play the role of PUCs under the TELRIC pricing regime and set licensing terms. Leasing access to local loops involved the pricing of a homogeneous good; in contrast, technical specifications vary significantly across licensing negotiations for IP. Competition authorities may not be equipped with the technical expertise to evaluate IP properly in every negotiation. If the use of government agencies to determine TELRIC prices resulted in failed negotiations and the misallocation of resources in the local telecommunications industry, then one would expect the likelihood of successful negotiations and efficient pricing to be even lower in complex IP negotiations in which competition authorities can intervene and set royalties.

2. *The Inefficiency of TELRIC Pricing*

The FCC's TELRIC pricing rule was based on a forward-looking measure of the costs of building a hypothetical local network that used the most-efficient technology. TELRIC diverged from the prices that incumbents and entrants would have voluntarily agreed upon in unregulated, market transactions.

TELRIC pricing failed to compensate incumbents for the cost of providing entrants unbundled access to their networks. TELRIC pricing set prices as total incremental costs. However, total incremental costs do not include two components of the incumbent's total economic costs: shared and common costs and opportunity costs. The firm's shared costs and common costs are its economies of scope, which are the firm's efficiency gains from jointly producing multiple services. Economic cost includes incremental cost *and* the opportunity costs of the facilities to which the incumbent provides access. Armen Alchian's classic definition of cost states that "the cost of an event is the highest-valued opportunity necessarily forsaken."⁵⁴ The highest net benefit of all opportunities forgone is the opportunity cost. A supplier will not invest in a transaction unless it expects the returns from the transaction to cover all economic costs, including a competitive return to invested capital. Such pricing that fails to account for shared and common costs and opportunity costs is inefficient, because it discourages both lessors and lessees from making optimal levels of investment.

The forward-looking-cost component of TELRIC pricing also failed to compensate incumbents for bearing the risk associated with building their networks. The FCC's notion of forward-looking costs was intended to avoid the fallacy of sunk costs, so that only the avoidable or future costs of decisions would be taken into account when setting the regulated price. The FCC, however, got so carried away with the projected cost of a hypothetically efficient network (as predicted by engineering computer models) that it recommended making

53. See, e.g., ROBERT S. PINDYCK & DANIEL L. RUBINFELD, MICROECONOMICS 584 (6th ed., Pearson Education, Inc. 2005).

54. Armen A. Alchian, *Cost*, in 3 INTERNATIONAL ENCYCLOPEDIA OF THE SOCIAL SCIENCES 404, 404 (David L. Sills ed., MacMillan Co. & Free Press 1968).

decisions based on irrelevant future costs while ignoring other relevant costs, especially the costs that economists ultimately care about—opportunity costs.⁵⁵

In its *First Report and Order* on interconnection, the FCC defined forward-looking costs as “other costs that a carrier would incur in the future.”⁵⁶ That definition was fine as far as it went. The FCC then provided a measure that defined TELRIC to consist of “costs that assume that wire centers will be placed at the incumbent’s current wire center locations, but that the reconstructed local network will employ the most efficient technology for reasonably foreseeable capacity requirements.”⁵⁷ Despite the enormous amount of time and resources that the FCC devoted to writing its regulations on the pricing of forced sharing, the agency’s measure of forward-looking costs rested on multiple economic fallacies.

The FCC based TELRIC pricing on irrelevant costs. The FCC’s cost definition was based on the hypothetical decision whether or not to expand capacity, contingent on two preconditions: that the entrant’s current wire center locations are given, and that the incumbent has fully flexible capacity. However, those assumptions correspond to a model relevant to *rebuilding* a network, not *expanding* access to an existing network. The FCC’s hybrid cost definition did not represent the actual costs of an entrant to purchase access to the incumbent’s network elements, because the entrant could (contrary to the FCC’s assumption) choose where to locate its wire centers. The FCC’s cost definition also did not represent the incumbent’s costs, because the incumbent already had loops and switches in place. Thus, the FCC’s cost measure was relevant to neither the entry and operating decisions of the entrant nor the expansion and operating decisions of the incumbent.

The FCC’s use of a “most efficient technology” standard also misrepresented competitive pricing. In an unregulated market, the price of a new product, such as a computer chip, typically is highest when it is first introduced. The price then gradually declines with the introduction of the next generation of the product. Importantly, existing products are not devalued immediately by new substitutes. The lag between market entry and the price reduction is due to the adjustment costs of entry. The current market price of an alternative thus reflects the projected cost of the alternative *plus* the adjustment cost associated with installing and adapting to the alternative. The FCC’s “most efficient technology standard” set price according to the most efficient technology *before* the market had made that technology available. By ignoring the adjustment cost of the most efficient future technology, the FCC’s TELRIC measure did not represent a market price.

Such pricing of IPR would suppress innovation new, valuable patents. Without that lag in the decline in price, an industry would wait for the next development before making a commitment to develop the next generation of goods. No progress would occur. The number of patents available from each firm in the future (along with the potential quality of those patents) is a function of the current price for patented technology. When the current price that licensees pay for patented technology is low, firms will pursue only easily attainable

55. SIDAK & SPULBER, *supra* note 21, at 419-26; J. Gregory Sidak & Daniel F. Spulber, *Givings, Takings, and the Fallacy of Forward-Looking Costs*, 72 N.Y.U. L. REV. 1068 (1997).

56. *First Report and Order*, *supra* note 39, ¶ 683 at 15,848.

57. *Id.* ¶ 685 at 15,849.

technologies, because those technologies are the only ones for which the firm expects a positive return on its sunk investment in innovative activity. The late Alfred Kahn described this phenomenon in a regulatory setting as “anticipatory retardation” of investment, where network operators pursue “the most recent technology only when market prices [are] significantly high to enable them to recoup a disproportionately large portion of their capital costs in the early years.”⁵⁸ Analogously, a patent owner will pursue difficult or speculative inventions only if the expected licensing fees that the patent holder can derive from a successful, valuable patent are high enough to recoup the sunk cost of innovation in both the patent owner’s successful *and* unsuccessful inventions. Having a price trajectory for a successful invention that declines gradually over time thus enables a firm to capture more consumer surplus and thereby recover the costs of its investment. This model is more conducive to private investment than one in which new goods are devalued immediately by new substitutes, which was what the FCC’s TELRIC model did.

Similarly, the FCC’s forward-looking cost measure ignored investment-backed expectations. For a particular operation to be economically viable over the long run, a firm must have a reasonable expectation that it will be able to recover its fixed and sunk costs and earn a competitive return on the investment. If, *before* it has sunk that investment, the firm had no expectation that it would recover its sunk investment, then it would not make the investment. By ignoring the incumbent’s expectation of recouping its investment, TELRIC pricing failed to replicate competitive market conditions.

C. Consequences of Forced Sharing

Forced leasing or licensing is a form of forced sharing. In the telecommunications industry, forced leasing imposed social costs by distorting the incentives of both incumbents and entrants. Similar distortions would occur among licensors and licensees of patents if competition authorities use competition law to impose forced sharing and regulated pricing of IPR.

1. *The Consequences of Forced Sharing Under the Telecommunications Act*

Empirical studies on capital expenditure by incumbents after the passage of the Telecommunications Act support the conclusion that forced sharing suppressed investment by incumbents.⁵⁹ Empirical studies on the entry of competing local

58. ALFRED E. KAHN, LESSONS FROM DEREGULATION: TELECOMMUNICATIONS AND AIRLINES AFTER THE CRUNCH 29 (2004) (citing William Fellner, *The Influence of Market Structure on Technological Progress*, in 8 READINGS IN INDUSTRIAL ORGANIZATION AND PUBLIC POLICY 277, 287-91 (Richard B. Heflebower & George W. Stocking eds., Richard D. Irwin, Inc. 1958)). See also ALFRED E. KAHN, WHOM THE GODS WOULD DESTROY, OR HOW NOT TO DEREGULATE 4 (2001); SIDAK & SPULBER, *supra* note 21, at 403-26.

59. Economists have analyzed this argument from the perspective of real-options theory. The option to buy the use of the incumbent’s unbundled network elements is valuable. The entrant can avoid the risks associated with building its own facilities, and if it fails in its attempt to enter the market for local telecommunications service by buying use of the incumbent’s network elements, the incumbent bears all the costs of the entrant’s failed investment. Thus, the regulator forces the incumbent to provide entrants a free option on its investment. See Hausman, *Valuing the Effect of Regulation on New Services in Telecommunications*, *supra* note 27; Hausman & Sidak, *A Consumer Welfare Approach to the Mandatory Unbundling of Telecommunications Networks*, *supra* note 51; Pindyck, *supra* note 51. By the principle of “conservation of value” in finance, the regulator’s grant of a free option to an entrant

telephone companies suggest that forced sharing deterred facilities-based competition.

a. Reduction in Incumbents' Investments

In his separate opinion in *Iowa Utilities Board*, Justice Stephen Breyer explained the importance of incentives to invest on innovation: “Nor can one 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.”⁶⁰ Many scholars have examined the actual effect of forced sharing on incumbents' investment. Empirical evidence indeed indicates that forced sharing suppressed investment by incumbents.

Thomas Hazlett observed that incumbent investment in 2003 actually fell below the level of investment in 1996 in nominal dollars.⁶¹ For example, capital expenditures by the RBOCs in local exchange facilities increased from approximately \$22 billion in 1996 to \$38 billion in 2000, when capital expenditure programs that had begun before 1996 had been completed, but then decreased to \$17 billion in 2003.⁶² Hazlett refuted arguments that the reduction in incumbents' investments was attributable to the stock market downturn of the early 2000s: a network provider generally requires capital expenditures of 15 to 20 percent of revenues simply to maintain its capital stock, and RBOC annual investment fell to only 13.5 percent of revenues in 2003, which suggests network disinvestment.⁶³ The fact that incumbents' revenue and investment fell in the early 2000s relative to historic averages implies that forced sharing in the U.S. telecommunications industry stifled investment by incumbents.

Robert Crandall found that the incumbents' loss of end-user subscribers to entrants reduced the incumbents' revenues by more than their costs.⁶⁴ Whereas the incumbents lost roughly 60 percent of the revenues associated with a given line when it was used by an entrant to serve the retail customer, the avoided costs of customer service and marketing were only about 10 percent of the Bell companies' total costs.⁶⁵ Crandall questioned the hypothesis offered by the entrants that lower unbundled rates induce incumbents to invest more (to counter increased competition from entrants), because it is not logical for an incumbent to invest more if entrants may purchase use of the incumbent's network at wholesale rates (less avoided costs) lower than retail rates, as is the case under

diminishes the incumbent's expected return on its investment, thereby diminishing the incumbent's incentives to invest in network infrastructure. *See, e.g.*, RICHARD A. BREALEY, STEWART C. MYERS & FRANKLIN ALLEN, *PRINCIPLES OF CORPORATE FINANCE* 475-76 (9th ed., McGraw-Hill/Irwin 2008). Economists have made a similar argument about damages for patent infringement that are incorrectly calculated to be too low. *See* Jerry A. Hausman, Gregory K. Leonard & J. Gregory Sidak, *Patent Damages and Real Options: How Judicial Characterization of Noninfringing Alternatives Reduces Incentives to Innovate*, 22 *BERKELEY TECH. L.J.* 825 (2007).

60. *AT&T Corp. v. Iowa Utils. Bd.*, 525 U.S. 366, 429 (1999) (Breyer, J., concurring in part and dissenting in part).

61. Thomas W. Hazlett, *Rivalrous Telecommunications Networks With and Without Mandatory Sharing*, 58 *FED. COMM'N L.J.* 477, 492 (2006).

62. *Id.* at 492-93.

63. *Id.* at 493.

64. ROBERT W. CRANDALL, *COMPETITION AND CHAOS: U.S. TELECOMMUNICATIONS SINCE THE 1996 TELECOM ACT* (Brookings Institution Press 2004).

65. *Id.* at 65.

forced sharing.⁶⁶ Crandall found that the Bell companies actually cut their capital expenditures in 2002 and 2003, and that the decline was greatest in those states that reduced their unbundled rates.⁶⁷ Crandall found that a simple regression of the unbundled rate in 2002 on the FCC's measure of costs, the state regulatory variables (such as price-cap and rate-freeze dummy variables), and the Bell company's capital spending from 1996 to 1999 in that state provided a statistically significant negative coefficient on the capital spending from 1996 to 1999.⁶⁸ He concluded that greater capital expenditures by the Bell companies between 1996 and 1999 were correlated with lower unbundled rates in 2002.⁶⁹ Crandall observed that this finding suggests that regulators punish investment (by which he presumably means that regulators exploit sunk investment by the owner) by reducing the rate at which the incumbent must lease its network or portions thereof to competitors.⁷⁰

b. Reduction in Entrants' Incentives to Invest in New Networks

Empirical evidence indicates that entrants reduced investment in new networks once regulators offered them cheap access to incumbent facilities. Jerry Hausman and Gregory Sidak evaluated the effects of forced sharing in the United States, the United Kingdom, Canada, and Germany.⁷¹ Their analysis found that U.S. entrants increasingly relied on leasing access to incumbents' UNEs as their preferred mode of entry in the early 2000s.⁷² From December 1999 to December 2002, the percentage of entrants' unbundled network element lines out of total entrant lines increased from 23.9 percent to 70.5 percent.⁷³ In another analysis of U.S. data, Thomas Hazlett also concluded that the pattern of UNE entry in the United States suggested that competition achieved through forced sharing and wholesale price controls did not lead to facilities-based entry; instead, rapid growth in the use of unbundled network elements quickly became the dominant form of entry.⁷⁴

Hazlett also found that capital expenditures in wireline telecommunications networks declined dramatically for both incumbents and entrants. He estimated that the simple correlation between UNE lines and non-cable facilities-based lines was roughly -1 .⁷⁵ That negative correlation indicates that as the use of forced sharing (UNE lines) increased, construction of facilities-based competitive lines decreased by a similar percentage. Hazlett also found that the number of non-cable facilities-based lines decreased from 4.1 million at the end of 2000 to 3.2 million by mid-2003.⁷⁶ Hazlett explained that competitive networks most likely develop not from regulation that compels the opening of existing delivery platforms to multiple operators, but from policies nurturing the development of

66. *Id.* at 69-70.

67. *Id.* at 70.

68. *Id.* at 71.

69. *Id.*

70. *Id.*

71. Hausman & Sidak, *Did Mandatory Unbundling Achieve Its Purpose?*, *supra* note 51.

72. *Id.* at 200-04.

73. *Id.* at 200.

74. Hazlett, *supra* note 61, at 488.

75. *Id.*

76. *Id.*

rival infrastructure in adjacent markets or the adoption of alternative technologies like broadband and wireless communications networks.⁷⁷

The failure of forced sharing to promote investment by entrants raises the question of whether forced sharing of IPR at regulated rates would promote or stunt innovation. If downstream producers could use competition law to force IPR holders to license valuable inputs to them at low rates, then both IPR holders and downstream producers would have reduced incentives to invest in innovative activities necessary to create the next generations of valuable inputs. Suppressing royalties may seem like a positive outcome in the short run. The marginal cost of using the patented invention would decrease, which may lower retail prices and stimulate downstream competition. However, that outcome would promote only static competition without fostering dynamic competition. In the long-run, uncertainty as to whether inventors could collect royalties sufficient to recover their sunk investments would reduce inventors' incentives to invest. The virtuous cycle of dynamic competition—in which innovation drives competition and competition drives innovation—would slow.⁷⁸

2. *The Consequences of Using Competition Law to Force Sharing of IPR at Regulated Rates*

The debate over using competition law to regulate IPR license fees has thus far been strictly theoretical. The analogous experience of forced sharing under the U.S. Telecommunications Act may greatly inform that debate because it is real. The deleterious effects of forced sharing on investment by incumbents and entrants suggest the likely harm that forced sharing of essential IP at regulated rates would impose on the investment incentives of IP holders and would-be IP holders. Moreover, regulating licensing terms and conditions through competition law would magnify that harm to investment. To promote dynamic competition and innovation, policymakers should focus their attention on ensuring that investors can expect a competitive return on future innovations, rather than on reducing prices that end users pay for past innovations.

a. *Perverse Incentives from Applying the Essential Facilities Doctrine to IP*

By deeming certain IP to be “essential” and requiring forced sharing of such IP at regulated rates, policymakers would implicitly apply the essential facilities doctrine broadly to IPR. Although both the essential facilities doctrine and forced sharing of IPR have been justified as ensuring downstream competition,⁷⁹ the application of the essential facilities doctrine to intellectual property is antithetical to the policies of patent law. Unlike physical property, intellectual property cannot be used without disclosure or the significant possibility of disclosure. Once disclosed, it is easily misappropriated, and thus its value is easily destroyed. The owner of a football stadium can lock the gates to keep out those who will not pay for access, but the protections for the design of a machine

77. *Id.* at 490-91. *See also* Part IV.D *infra*.

78. *See* J. Gregory Sidak & David J. Teece, *Dynamic Competition in Antitrust Law*, 5 J. COMPETITION L. & ECON. 581 (2009).

79. *See, e.g.*, KELLOGG, THORNE & HUBER, *supra* note 20, at 139 § 3.2.1.

or any other form of intellectual property are far less effective and rarely self-enforcing. Thus, to preserve the incentives for the creation of new knowledge, the legal system gives to the inventor the ability to preserve the exclusivity of its use.

The essential facilities doctrine is, above all, a legal rule of forced sharing and compulsory dealings. This characteristic alone is inconsistent with the exclusivity that is necessary to preserve incentives to create, the core operative device of intellectual property law in a market economy. Ambiguity in competition law as to the degree to which competition authorities will apply the essential facilities doctrine will deter investment. For example, China's IPR guidelines say that "the possession of intellectual property rights by a business operator does not in and of itself constitute a direct basis for determining or inferring that it has a dominant market position," but the guidelines immediately thereafter say that "intellectual property rights will usually be a factor that is considered when determining whether a business operator has a dominant market position, particularly in those industries that greatly rely on intellectual property rights."⁸⁰ That provision is problematic. One could easily construe it to mean that ownership of IPR implies possession of market power whenever the intellectual property happens to be valuable. In any event, even if IPR ownership confers dominance, a regime where fees for use of the IPR are set or subject to approval by the government is fundamentally at odds with the incentive scheme underlying the patent system.

The essential facilities doctrine is most likely to condemn intellectual property in precisely those circumstances in which this result is least defensible. Under the essential facilities doctrine, the more an invention is unique, valuable, and difficult to duplicate, the greater is the obligation to share it. Indeed, the above statement from China's IPR guidelines implies that it will be more likely that China's Anti-monopoly Enforcement Authority will find IPR holders to possess market power in industries that "greatly rely on intellectual property rights." However, it is in those industries that firms make significant sunk investments in R&D to develop highly valuable technologies. Placing greater weight on ownership of IPR in assessing market power and forcing the licensing of IPR at regulated rates would create perverse incentives of would-be IPR holders not to invest in the most valuable inventions. In short, the logic of the essential facilities doctrine is inherently inconsistent with intellectual property protection.

b. Truncating the IPR Holder's Gains from Trade

Enforcing rate regulation through competition law creates an additional risk for IPR holders that the incumbent local telephone companies did not face under the forced-sharing provisions of the Telecommunications Act of 1996. The uncertainty created by the prospect of regulation of such fees is exacerbated. In addition, the possibility of incurring antitrust sanctions is a source of substantial additional risk to investments. An owner of IPR could potentially be fined substantial amounts by multiple agencies if it guesses wrong about the fees that those agencies permitted it to charge. That risk, even without actual enforcement action, by itself devalues IPR.

80. China IPR Guidelines, *supra* note 9, art. 17.

Significantly, however, in the *Trinko* decision in 2004 the U.S. Supreme Court established that an incumbent's failure to comply with the forced-sharing provisions of the Telecommunications Act of 1996 did not, by itself, state a claim for antitrust remedies under the Sherman Act.⁸¹ The use of competition law to compel access to IP presents a different situation. In addition to being unable to recover its opportunity costs and recoup its sunk investments, an IPR holder subject to an uncertain regime of forced sharing of essential IP at regulated rates would be subject to antitrust penalties—lost profits damages of would-be licensees, enhanced damages, fines, and possibly other public sanctions—if the IPR holder is found liable for its refusal to license its IP. Relative to the experience of forced sharing of telecommunications networks at regulated prices, the lost opportunity cost and potential antitrust penalties of an IPR regime that is conditioned on forced sharing at regulated royalty rates would greatly increase the risk surrounding investment in a given kind of IP.

By truncating the IPR holder's gains from trade and by adding the potential cost of antitrust penalties, forced sharing imposed through competition law would deter investment. A would-be IPR holder's willingness to invest in an invention depends on the expected degree of IP protection available at the time of the licensing negotiation, which occurs after the IPR holder has invented its technology and obtained a patent for it but before a would-be licensee has agreed to license it. By impeding the IPR holder's ability to gain a return on its investment in its IPR and adding the risk of antitrust penalties, IP rate regulation analogous to TELRIC pricing would reduce the degree of IPR protection available at the time of the negotiation.

D. Was Forced Sharing Necessary to Achieve Facilities-Based Competition?

As I explained above, forced sharing of wireline local networks at rates established by government agencies did not attain the U.S. government's objective of creating meaningful, sustainable competition for local telephone service. Not coincidentally, however, such competition nevertheless emerged from enterprises that were deliberately left unregulated and exempt from forced-sharing requirements: operators of cable television and wireless telecommunications networks.

1. Growth in Cable Telephony

Before the passage of the Telecommunications Act of 1996, many states barred competitive entry into the provision of local telephone service. Other states required cable operators and other entrants to obtain certificates from state regulators to provide local telephone service.⁸² The Telecommunications Act amended the Communications Act of 1934 to require the FCC to preempt state or local government regulations that create entry barriers in telecommunications

81. *Verizon Commc'ns Inc. v. Law Offices of Curtis V. Trinko, LLP*, 540 U.S. 398 (2004) (construing 15 U.S.C. § 2).

82. See PETER W. HUBER, MICHAEL K. KELLOGG & JOHN THORNE, *FEDERAL TELECOMMUNICATIONS LAW* 1203 § 13.7.3 (2d ed., Aspen Law & Business 1999).

services.⁸³ Furthermore, the Telecommunications Act did not subject cable operators to the forced-sharing requirements imposed on incumbent local telephone companies. Consequently, operators of cable television networks had both the means and incentive to upgrade their networks to provide two-way telecommunications service.

Cable telephony investment and consumption rose substantially in the early to mid 2000s. According to the National Cable Television Association, the number of cable telephone subscribers in the United States increased from 180,000 in the first quarter of 2000 to 2.5 million by September 2003.⁸⁴ In addition to deploying circuit-switched telephony, cable companies launched voice over Internet protocol (VoIP) service. From 2003 to 2006, the number of VoIP subscribers in the United States increased from 131,000⁸⁵ to 9 million, over half of which were subscribers to VoIP service provided by cable operators.⁸⁶ Comcast, the nation's largest cable company, launched its digital voice service in 2005⁸⁷ and by December 2007 had 4.4 million subscribers.⁸⁸ Fixed-line operators perceived the threat posed by cable telephony to be significant.⁸⁹ Verizon launched FiOS TV in 2005,⁹⁰ and as of March 2011, FiOS TV had 3.7 million customers.⁹¹ Figure 1 shows the increase in cable telephone subscribership from 1999 to 2008, as reported by the FCC, relative to the change in subscribership to what the FCC categorized as "other technology."⁹²

83. 47 U.S.C. § 253; First Report and Order, *supra* note 38, ¶ 101 ("[S]ection 253 requires the Commission to preempt state or local regulations or requirements that 'prohibit or have the effect of prohibiting the ability of any entity to provide any interstate or intrastate telecommunications service.'").

84. National Cable Television Association, Statistics & Resources (available at <http://www.ncta.com/Docs/PageContent.cfm?pageID=86>).

85. *1 mln US VOIP Subscribers by Year-End 2004*, IT Facts (Aug. 30, 2004), <http://www.itfacts.biz/1-mln-us-voip-subscribers-by-year-end-2004/1453> (citing the Yankee Group).

86. *9 mln US VOIP Subscribers in 2006*, IT Facts (Aug. 30, 2007), <http://www.itfacts.biz/9-mln-us-voip-subscribers-in-2006/8794> (citing the Yankee Group).

87. Press Release, Comcast, Comcast Chairman and CEO Brian Roberts Unveils Boston and Hartford Comcast Digital Voice Rollout Plans (Apr. 13, 2005), <http://www.comcast.com/About/PressRelease/PressReleaseDetail.ashx?PRID=158>.

88. COMCAST CORP., 2007 ANNUAL REPORT (SEC FORM 10-K), at 25 (filed Feb. 20, 2008).

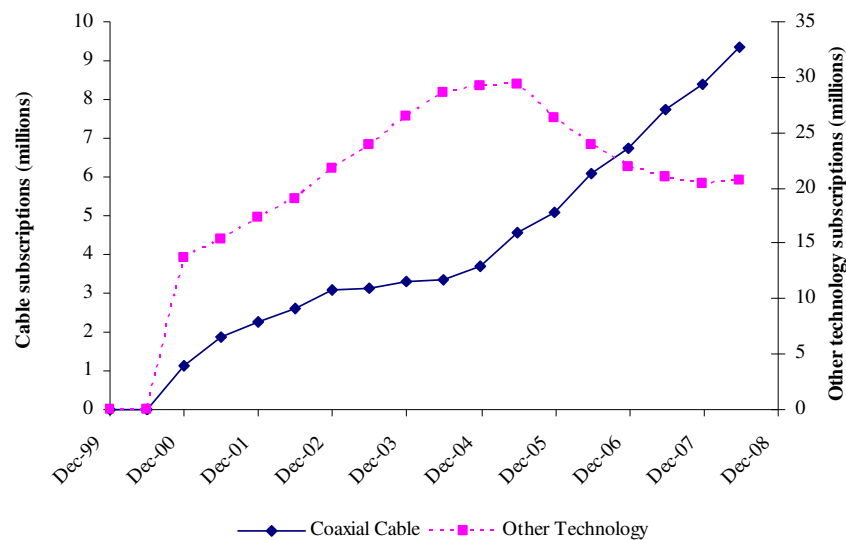
89. *See, e.g.*, VERIZON COMMUNICATIONS INC., 2004 ANNUAL REPORT (SEC FORM 10-K), at 10-11 (filed Mar. 14, 2005) (disclosing cable companies as a source of competitive risk).

90. Press Release, Verizon, Verizon FiOS TV Is Here! (Sept. 21, 2005), <http://newscenter.verizon.com/press-releases/verizon/2005/page-29707757.html>.

91. Verizon Commc'ns Inc., Verizon FiOS Fact Sheet (Information Reflects the End of First-Quarter 2011), <http://newscenter.verizon.com/kit/fios-symmetrical-internet-service/all-about-fios.html> (last visited Apr. 28, 2011).

92. FCC, LOCAL TELEPHONE COMPETITION: STATUS AS OF JUNE 30, 2010, at tbl.5 (Mar. 2011), available at http://www.fcc.gov/Daily_Releases/Daily_Business/2011/db0321/DOC-305297A1.pdf; FCC, LOCAL TELEPHONE COMPETITION: STATUS AS OF JUNE 30, 2005, at tbl.5 (Apr. 2006), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-264742A1.pdf; FCC, LOCAL TELEPHONE COMPETITION: STATUS AS OF JUNE 30, 2004, at tbl.5 (Dec. 2004), available at http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/IAD/lcom1204.pdf.

FIGURE 1: CABLE TELEPHONE SUBSCRIPTIONS COMPARED WITH SUBSCRIPTIONS TO OTHER TELEPHONE TECHNOLOGIES, 1999–2008



Note: Subscriptions from June 2005 to June 2008 include VoIP subscriptions. “Other technologies” encompass non-wireless and non-cable technologies of non-incumbents.

Sources: FCC, LOCAL TELEPHONE COMPETITION (for the years 2004, 2005, 2010), *supra* note 92, at tbl.5.

Had cable operators not feared potential imposition of forced-sharing requirements, they may have been willing to make the investment to upgrade their networks to provide telecommunications service sooner than they did. Thomas Hazlett has observed that the strong emergence of VoIP in 2004 coincided with the “demise of the network sharing regime” for broadband, suggesting that cable operators delayed investment in telephony when they still faced a significant risk of forced sharing.⁹³

2. Competition From and Growth in Wireless Telephony

Wireless phone service also emerged as an additional alternative to local telecommunications service provided by incumbent local telephone companies. The statutory definition of a local exchange carrier does not include anyone “engaged in the provision of a commercial mobile service.”⁹⁴ The FCC therefore never subjected wireless carriers to the forced-sharing provisions imposed on incumbent local telephone companies.⁹⁵ The FCC also has not considered mobile switches to be essential facilities, unlike local wireline loops.⁹⁶ Thus, like cable operators, operators of wireless networks had the means and incentives to expand the capacity of their networks to render them capable of providing affordable wireless telephone service to the mass market.

93. Hazlett, *supra* note 61, at 490.

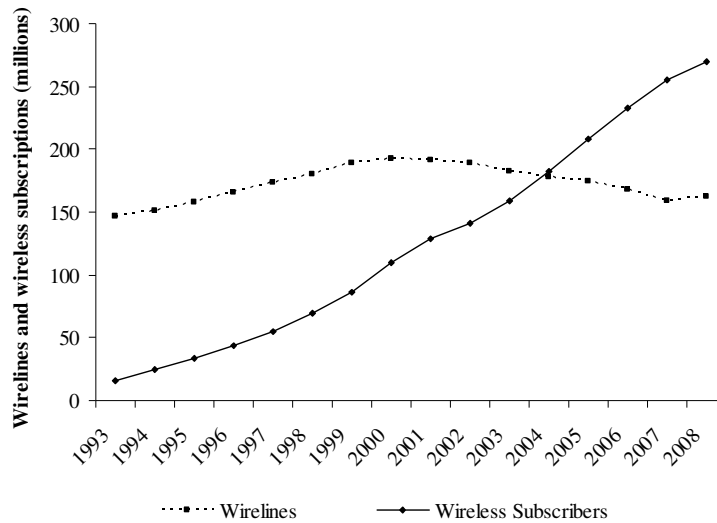
94. 47 U.S.C. § 153(26).

95. See HUBER, KELLOGG & THORNE, *supra* note 82, at 961 § 10.6.4.

96. See *id.* at 949 § 10.5.2.

The trend of wireless substitution in the United States is evidence of the degree to which consumers perceive wireless phones to be (superior) substitutes for fixed-line connections. From 2000 to 2008, the total number of switched-access lines supplied by incumbent local telephone companies and competing local telephone companies declined by 15 percent, from 192.4 million to 162.6 million lines, with the FCC citing wireless substitution as a significant factor.⁹⁷ Figure 2 shows the increase in wireless subscriptions over the number of wirelines.

FIGURE 2: WIRELESS SUBSCRIPTIONS VERSUS NUMBER OF SWITCHED-ACCESS LINES IN THE UNITED STATES, 1993–2008



Note: Before 1999, the number of wirelines reflected switched-access lines for end-user customers of incumbent local telephone companies only. Beginning in 1999, the number of wirelines included switched-access lines for end-user customers of both incumbents and entrants. In 1999, the proportion of entrant wirelines was approximately 1.5% that of incumbent wirelines. Before 2005, only carriers with more than 10,000 switched-access lines were included in the FCC's data. All carriers were included for 2005–2008.

Source: FCC, TRENDS IN TELEPHONE SERVICE 2010, *supra* note 97, tbls.7.1, 11.1.

A 2010 National Health Interview Survey reported that 26.6 percent of American households had *only* wireless phones by the first half of 2010,⁹⁸ up from 10.5 percent reported in the first half of 2006 and 3.2 percent in the first half of 2003.⁹⁹ The same survey found that 15.9 percent of U.S. homes had

97. FCC, TRENDS IN TELEPHONE SERVICE, at 7-1 & tbl. 7.1 (Sept. 2010), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-301823A1.pdf [hereinafter FCC, TRENDS IN TELEPHONE SERVICE 2010].

98. Stephen J. Blumberg & Julian V. Luke, Wireless Substitution: Early Release of Estimates from the National Health Interview Survey, January-June 2010 1 (Dec. 21, 2010), available at <http://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless201012.pdf>.

99. Stephen J. Blumberg & Julian V. Luke, Wireless Substitution: Early Release of Estimates from the National Health Interview Survey, July-December 2006 4, tbl.1 (May 14, 2007), available at <http://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless200705.pdf>.

landlines in 2009 yet received all or nearly all their calls on wireless phones.¹⁰⁰ From 2000 to 2008, telephone wirelines per 100 persons in the United States declined from 67.9 to 50.9, while wireless subscribers per 100 persons increased from 34.5 to 86.4.¹⁰¹

3. *Investment in Next-Generation Fiber Broadband After the FCC Removed the Threat of Forced Sharing*

U.S. incumbent local telephone companies dramatically increased their investments in next-generation broadband technology after the FCC determined in 2004 that it would not force them to share with competitors or new entrants the new fiber-copper infrastructure they desired to deploy in their networks.¹⁰² In response to the FCC's decision, SBC (which later acquired the largest competing local telephone company, AT&T, and adopted the AT&T brand name) announced in 2004 its revised plan to provide 18 million households with super high-speed data, video, and voice services by the end of 2007—instead of by 2009, as SBC had originally announced.¹⁰³ SBC planned to invest \$4 to \$6 billion to deploy 38,800 miles of fiber (twice as much fiber as it had used to build its DSL network).¹⁰⁴ By the end of 2008, AT&T passed 17 million living units with its hybrid fiber-to-the-premises and fiber-to-the-node broadband services.¹⁰⁵ Subscribership expanded from 51,000 subscribers in June 2007 to 549,000 in June 2008 and 1,045,000 by December 2008; in 2008 alone, AT&T spent \$13.7 billion in wireline capital expenditures.¹⁰⁶

Verizon began deploying FiOS, its fiber-to-the-home service, in 2004.¹⁰⁷ It increased its annual wireline capital expenditures by over 45 percent from \$7.1 billion in 2004¹⁰⁸ to \$10.3 billion in 2006.¹⁰⁹ By the end of 2008, Verizon had passed 12.7 million premises for FiOS service and had 1.9 million FiOS TV customers, approximately doubling the number of customers from the previous year.¹¹⁰ Verizon had \$9.8 billion in wireline capital spending in 2008, directed to high-growth markets such as high-speed wireless data services and fiber optics to the premises.¹¹¹

100. *Id.*

101. FCC, TRENDS IN TELEPHONE SERVICE 2010, *supra* note 97, tbl. 16.2.

102. Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers, Order on Reconsideration, 19 F.C.C.R. 20,293 (2004) (reversing the FCC's earlier decision to subject fiber-to-the-curb to forced-sharing requirements).

103. See Press Release, SBC Communications Inc., SBC Communications to Rapidly Accelerate Fiber Network Deployment in Wake of Positive FCC Broadband Rulings (Oct. 14, 2004).

104. *See id.*

105. AT&T INC., 2008 ANNUAL REPORT (SEC FORM 10-K), at 2 (Feb. 25, 2009).

106. *Id.* at 24.

107. See Verizon Communications Inc., FTTP and FiOS News, <http://newscenter.verizon.com/kit/fiber/>.

108. VERIZON COMM'NS INC., 2005 ANNUAL REPORT (SEC FORM 10-K), at 19 (Mar. 14, 2006).

109. VERIZON COMM'NS INC., 2006 ANNUAL REPORT (SEC FORM 10-K), at 15 (Mar. 1, 2007).

110. VERIZON COMM'NS INC., 2008 ANNUAL REPORT (SEC FORM 10-K), at 10 & exh.13 (Feb. 24, 2009).

111. *Id.* at 16 & exh.13.

4. *Is Forced Sharing of IPR at Regulated Rates Necessary to Promote Competition and Innovation?*

The IPR policies that have been adopted or are being proposed pursuant to other nations' competition laws would force sharing of IPR at regulated rates as a way to promote downstream competition and innovation. However, the experience with U.S. telecommunications legislation confirms that forced sharing at rates established or approved by the government stifles rather than promotes competition and innovation. As I described above, the emergence of facilities-based competition from cable television, wireless, and next-generation fiber broadband refutes the conjecture that forced sharing was necessary because of insurmountable barriers to entry in the United States.¹¹² Global competition authorities have no basis for predicting that the emergence of new technologies will be insufficient to preserve competition in products and services relying on essential IP.

In markets characterized by dynamic competition, firms compete not only on static price reductions, but also to introduce first the next generation of a new technology. Competition *for* the market can be viewed as a contest to define entirely new demand curves or to push existing demand curves outward with vastly improved combinations of price and performance.¹¹³ Market rewards associated with obtaining a patent—which include supracompetitive profits from the lawful exercise of the right to exclude—promote investment in valuable inventions. Forced sharing of IPR at regulated rates would only undermine the dynamic competition that IPR protection exists to promote.

IV. CONCLUSION

The experience of telecommunications regulation in the United States illustrates the potential for the application of competition law to the licensing of intellectual property rights to hinder rather than promote innovation and competition. The IPR guidelines recently adopted or recommended by the competition authorities of the EU, China, and Korea reveal a common concern over IPR holders—and particularly holders of essential IPR—using market power that may be conferred by their IPR to restrict competition. The AT&T divestiture and the forced sharing of telecommunications networks under the Telecommunications Act of 1996 sought to address analogous concerns. However, the AT&T divestiture delayed the introduction of many new products. Forced sharing suppressed investment by incumbents and entrants alike. Incumbents reduced capital investments in their networks during the period of forced sharing, and reductions in capital expenditures were greatest in states that reduced their regulated rates. Entrants also reduced investment due to forced-sharing provisions of the Telecommunications Act. Instead of investing the capital necessary to build new

112. Indeed, the old AT&T by 2004 recognized the displacement effect of wireless service on its long-distance business. *See, e.g.*, AT&T CORP., 2003 ANNUAL REPORT (SEC FORM 10-K), at 2 (filed Mar. 15, 2004) (“[C]onsumer long distance voice usage is declining as a result of substitution to wireless services, internet access and e-mail/instant messaging services, particularly in the ‘dial one’ long distance, card and operator services segments.”).

113. *See, e.g.*, Howard A. Shelanski & J. Gregory Sidak, *Antitrust Divestiture in Network Industries*, 68 U. CHI. L. REV. 1 (2001); Sidak & Teece, *supra* note 78.

networks, they increasingly relied on leasing access to pieces of the incumbents' networks. The demise within a few short years of many new entrants indicates that forced sharing failed to promote lasting competition and innovation. Meanwhile, the growth and commercial success of cable telephony and wireless, both of which were left unregulated, indicates that forced sharing was unnecessary to promote competition.

Forced sharing is an outdated and inefficacious form of regulatory intervention that suppressed investment in the United States. The fact that virtually all bilateral negotiations for access to incumbent local telephone companies' networks resulted in arbitration before state PUCs indicates that, when the owner of a valuable input faces the prospect of being compelled to license the input at an uncompensatory rate, bilateral negotiation breaks down. A licensee's ability to use competition law to force an IPR holder to license its IP at low rates would undermine bilateral licensing negotiations. Government-imposed licensing fees would prevent IPR holders from recouping their sunk investments and would reduce their incentives to invest in innovation. Adding the risk of antitrust penalties would further deter investment.

Competition authorities should instead adopt policies that will promote private investment in new technologies. The key to unlocking such private investment is to permit voluntary contractual arrangements among IPR holders and licensees for the resale of existing goods and for the development of next-generation technologies.