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Reviving an Epithet: A New Way Forward for the Essential Facilities Doctrine

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ABSTRACT

For sound economic reasons, the antitrust laws, in general, do not require firms to share their assets with rivals. When a particular asset has natural monopoly characteristics and is used as an input in other markets, however, the essential facilities doctrine requires that the asset be shared with firms in related markets. In recent decades, the Supreme Court and leading scholars have criticized the doctrine, claiming it is economically inefficient and taxes the institutional capacity of the judiciary.

Historically, the courts most often applied the doctrine to tangible natural monopolies like electric transmission grids and bottleneck railroad lines. In recent decades, specialized federal regulators have established open access regimes over these assets to ensure the associated monopoly power is not extended into markets that can be competitive. In this context, application of the doctrine is likely to be either redundant or counterproductive. Regulatory bodies are institutionally superior to the judiciary in fashioning and ensuring compliance with mandated access decrees. Insofar as regulators fail to perform their duties, courts should not act as a "backstop" to agency failure. Instead, Congress should strengthen the agencies' statutory authority to establish open access regimes.

Legal and technological developments over the past thirty years have conferred essential facility characteristics on certain intangible assets. Examples of these intangible essential facilities include patents on upstream research tools in biotechnology and the interfaces on high-technology platforms that exhibit significant network externalities and enjoy intellectual property protection. These assets have no feasible substitutes and are necessary inputs in multiple products. As a result, firms can foreclose competition in adjacent markets by denying rivals of access to these critical assets. To mitigate this possibility, the essential facilities doctrine can be used to ensure that firms seeking to produce goods ranging from cancer therapies to computer operating systems have access to the necessary intellectual property. Because assets like gene patents and the interfaces on Microsoft Windows are frequently licensed in a market setting and are non-rivalrous, courts are institutionally capable of ordering access and setting the terms of sharing for intangible essential facilities.

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Advocating a break from traditional applications of the doctrine, this Article argues that the essential facilities doctrine should not be applied to tangible natural monopolies that have been brought under regulatory open access regimes. Instead, it holds that the doctrine should be applied to a small segment of intangible assets that have acquired de facto natural monopoly status. This reorientation of the doctrine can act to promote competition and innovation without unduly burdening the federal courts.

I. INTRODUCTION

Tracing its origins back nearly a century,[1] the essential facilities doctrine holds that the owner of an asset that cannot be practicably duplicated and is necessary as an input in another market is required to share it with other firms. Failure to share such an asset can result in antitrust liability. The doctrine rests on two basic premises: First, a natural monopolist[2] in one market should not be permitted to deny access to the critical facility to foreclose rivals in connected markets;[3] and second, the more radical remedy of dividing the natural monopoly asset among multiple owners, while mitigating the threat of leveraging, could sacrifice important efficiencies.[4] The duty-to-deal under the doctrine is a narrow exception to the long-established antitrust rule that firms have no general obligation to share their assets with rivals.[5] Notwithstanding its vintage, the doctrine has received sharp criticism in recent decades. In *Verizon Communications, Inc. v. Law Offices of Curtis V. Trinko*, the Supreme Court stated in

[1] United States v. Terminal R.R. Ass'n, 224 U.S. 383, 390 (1912).
[2] *See* RICHARD A. POSNER, ECONOMIC ANALYSIS OF LAW 367 (7th ed. 2007) ("The structural circumstances in which monopoly is the cheapest way of organizing an industry [is described as natural monopoly] ... . The reason is that fixed costs are very large in relation to demand. If they can be spread over the market's entire output, a single firm supplying that output may have a lower average cost of production than two equally efficient firms, each of which would incur the same fixed costs but be able to spread them over only one-half the output.").
[3] If A is a natural monopoly and a necessary input in the competitive market B, the owner of A may have the ability and incentive to deprive unaffiliated firms in market B of access to A. *See infra* Part III.
[4] Abraham Bell & Gideon Parchomovsky, *Pliability Rules*, 101 MICH. L. REV. 1, 36 (2002-2003).
[5] *See* United States v. Colgate & Co., 250 U.S. 300, 307 (1919) ("In the absence of any purpose to create or maintain a monopoly, the [Sherman Act] does not restrict the long recognized right of trader or manufacturer engaged in an entirely private business, freely to exercise his own independent discretion as to parties with whom he will deal.").

dictum that the forced sharing of assets may conflict with the broader goal of the antitrust laws.[6] The late Phillip Areeda, co-author of the leading antitrust treatise, described the doctrine as "an epithet in need of limiting principles."[7] Others have been equally critical of the doctrine's economic purpose.[8] Nonetheless, some scholars continue to defend the doctrine as being economically rational and practically useful in this century.[9]

Based on economic and institutional considerations, this paper argues that the distinction between tangible and intangible essential facilities provides a dividing line on where the doctrine should be applied in the future. Although natural monopoly assets like electric transmission lines and natural gas pipelines can be leveraged into the competitive portions of their respective industries, the doctrine should not be applied to these tangible bottlenecks. In these traditional natural monopoly industries, regulatory agencies have effectively assumed the role of enforcing the doctrine.[10] Court-ordered access is likely to be redundant when a regulator is already

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[6] *See* Verizon Comm'ns, Inc. v. Law Offices of Curtis V. Trinko, LLP, 540 U.S. 398, 407-8 (2004) ("Firms may acquire monopoly power by establishing an infrastructure that renders them uniquely suited to serve their customers. Compelling such firms to share the source of their advantage is in some tension with the underlying purpose of antitrust law, since it may lessen the incentive for the monopolist, the rival, or both to invest in those economically beneficial facilities. Enforced sharing also requires antitrust courts to act as central planners, identifying the proper price, quantity, and other terms of dealing –a role for which they are illsuited [sic]. Moreover, compelling negotiation between competitors may facilitate the supreme evil of antitrust: collusion.").

[7] Phillip E. Areeda, *Essential Facilities: An Epithet In Need of Limiting Principles*, 58 ANTITRUST L.J. 841 (1989-1990).

[8] *See, e.g.*, Abbott B. Lipsky & J. Gregory Sidak, *Essential Facilities* 51 STAN. L. REV. 1187 (1998-1999); Keith N. Hylton, *Economic Rents and Essential Facilities*, 1991 BYU L. REV. 1243 (1991); David Reiffen & Andrew N. Kleit, *Terminal Railroad Revisited: Foreclosure of an Essential Facility or Simple Horizontal Monopoly?*, 33 J. L. & ECON. 419 (1990); Herbert J. Hovenkamp, *Unilateral Refusals to Deal, Vertical Integration, and the Essential Facility Doctrine* (University of Iowa Legal Studies Research Paper, Paper No. 08-31, 2008), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1144675.

[9] *See, e.g.*, Marina Lao, *Networks, Access, and "Essential Facilities": From* Terminal Railroad *to* Microsoft, 62 SMU L. REV. 557 (2009); Spencer Weber Waller, *Areeda, Epithets, and Essential Facilities*, 2008 WIS. L. REV. 359 (2008); Spencer Weber Waller & Brett Frischmann, *Revitalizing Essential Facilities*, 75 ANTITRUST L.J. 1 (2008-2009); Robert Pitofsky, Donna Patterson & Jonathan Hooks, *The Essential Facilities Doctrine Under U.S. Antitrust Law*, 70 ANTITRUST L.J. 443 (2002-2003).

[10] *See* Joseph D. Kearney & Thomas W. Merrill, *The Great Transformation of Regulated Industries Law*, 98 COLUM. L. REV. 1323, 1364 (1998) ("Given the near-complete reliance of market transactions in industries and industry segments that can be made competitive, the focus of the agencies necessarily turns to those market segments that have natural monopoly characteristics. Here, the great concern is that incumbent providers that control

performing the function. This proposition is not especially controversial as a legal matter and was, in fact expressed in *Trinko*.[11] Prudent application of the doctrine to intangible essential facilities, however, can improve economic efficiency without burdening the federal courts. Gene patents and the application programming interfaces on Microsoft Windows are examples of intellectual assets that have acquired essential facility status. They are de facto monopolies and not subject to regulatory oversight, suggesting they that can potentially be leveraged into adjacent markets to the detriment of consumers. Using the essential facilities doctrine to create a virtual open access regime over these assets can yield lower prices and greater innovation in the markets for products ranging from cancer therapies to computer operating systems. This proposed reorientation of the doctrine yields an optimal "division of labor" among different institutional spheres: Specialized industry regulators would mandate non-discriminatory access to rivalrous, tangible natural monopolies and generalist antitrust courts would compel the sharing of non-rivalrous, intangible essential facilities.

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bottleneck facilities will use their monopoly power to discriminate against competitors in the service segments that have been opened to competition. To prevent this from happening, a new set of regulatory obligations – including the duty to interconnect, to lease unbundled network elements, and to sell services for resale – is imposed on the owners of such bottleneck facilities and becomes the focal point of regulatory attention. In effect, the owners of natural monopoly facilities assume new common carrier duties toward their competitors, and these duties are regarded as more important than those they owe to their traditional customers. The role of the agency correspondingly shifts from protecting the end-user to *implementing a version of the essential facilities doctrine originally developed under the antitrust laws*.") (emphasis added).

[11] *See Trinko*, 540 U.S. at 412 ("One factor of particular importance is the existence of a regulatory structure designed to deter and remedy anticompetitive harm. Where such a structure exists, the additional benefit to competition provided by antitrust enforcement will tend to be small, and it will be less plausible that the antitrust laws contemplate such scrutiny.").

II. ECONOMIC FOUNDATIONS OF THE DOCTRINE

Cases implicating the essential facilities doctrine arise when a vertically-integrated[12] firm that is a natural monopolist in one market refuses to provide the monopolized input to a rival in a related competitive market. Antitrust issues concerning vertical relationships between firms are generally considered more complex than issues relating to horizontal relationships. In the latter context, scholars across the ideological spectrum are in general agreement that price fixing between rivals is harmful and should be per se illegal.[13] Similarly, most scholars are in agreement that a merger-to-monopoly should be enjoined or subject to significant divestitures to preserve some degree of competition.[14] Vertical restraints, however, have more ambiguous economic effects, and vertical foreclosure tactics such as denials of access to essential facilities are no exception. Refusals-to-deal may be based on a desire to create efficiencies such as limiting free-riding by rivals or eliminating the double marginalization problem arising from successive monopolies.[15] Economic theory and empirical evidence, however, suggest that denials of access can have anticompetitive effects under certain circumstances.[16] Careful application of

[12] A firm is vertically-integrated if it operates in distinct but connected markets. For example, a company that manufactures steel and automobiles can be described as vertically-integrated. In general, vertical relationships feature a customer-supplier relationship between two independent firms or two divisions within the same firm.
[13] *See* Thomas G. Krattenmaker & Steven C. Salop, *Anticompetitive Exclusion: Raising Rivals' Costs to Achieve Power over Price*, 96 YALE L.J. 209 (1986-1987) ("Today, antitrust law is most coherent and least controversial when trained on concerted action by competing firms, so-called 'horizontal restraints' or on 'horizontal'' mergers among competitors. Particular claims of collusion or undue concentration can be difficult to assess, but the factors to be examined are not in great dispute, and the illegitimacy of horizontal collusion or combination intended or expected to restrict output and raise prices is well settled.").
[14] *Id.*
[15] *See* Michael H. Riordan & Steven C. Salop, *Evaluating Vertical Mergers: A Post-Chicago Approach*, 63 ANTITRUST L.J. 513, 518 (1994-1995) ("[W]hen there is not perfect competition in the output market, a vertical merger has the potential to reduce costs and increase efficiency by eliminating a double monopoly markup on input costs. When the output technology is not in fixed proportions, a vertical merger also has the potential to reduce costs by eliminating distortions in efficient input usage that arise from noncompetitive input prices.").
[16] *See id.* at 519 ("[V]ertical mergers can lead to exclusionary effects by increasing rivals' costs of doing business. This may involve raising their input costs by foreclosing their access to important inputs or foreclosing their access to a sufficient consumer base.").

the essential facilities doctrine can prevent anticompetitive monopoly leveraging without deterring efficiency-enhancing conduct.

Chicago School thinkers, who have had a major influence on antitrust jurisprudence since the 1970s, have held that the extension of monopoly power from one market into a second market cannot have anticompetitive effects. In both the tying and vertical foreclosure contexts, the latter of which is relevant to the essential facilities doctrine, these scholars have argued that a monopolist in one market cannot increase its profits by extending its monopoly into an adjacent market *if the products are used in fixed proportions*.[17] Under this so-called single monopoly profit theorem, the monopolist can choose to extract the profits from the monopolized market, competitive market, or both.[18] The amount of profit that can be reaped, however, is fixed and cannot be augmented through the extension of monopoly power. Because monopoly leveraging cannot increase profits, Chicago School theory holds that when monopoly extension does occur it must be motivated by efficiency considerations.[19] These efficiencies include eliminating the double marginalization associated with successive monopolies, using a more cost-effective mix

[17] *See e.g.*, ROBERT BORK, THE ANTITRUST PARADOX 372-75, 380-81 (1978); Richard A. Posner, *The Chicago School of Antitrust Analysis*, 127 U. PA. L. REV. 925, 927 (1978-1979) ("The tie-in analysis, for instance, was extended to vertical integration in general. To illustrate, it makes no sense for a monopoly producer to take over distribution in order to earn monopoly profits at the distribution as well as the manufacturing level. The product and its distribution are complements, and an increase in the price of distribution will reduce the demand for the product. Assuming that the product and its distribution are sold in fixed proportions, … , the conclusion is reached that vertical integration must be motivated by a desire for efficiency rather than for monopoly.").

[18] *See* Posner, *supra* note 17, at 929 ("The leverage theory held that if a seller had a monopoly of one product, he could and monopolize its indispensable complements as well, so as to get additional monopoly profits. Thus, if he had a patented mimeograph machine, he would lease the machine at a monopoly price and also require his lessees to buy the ink used in the machine from him and charge them a monopoly price for the ink. This procedure, however, makes no sense as a matter of economic theory. The purchaser is buying a service, mimeographing. The pricing of its components is a mere details; it is, rather, the total price of the service that he cares about. If the seller raises the price of one component, the ink, the purchased will treat this as an increase in the price of the service. If the machine is already being priced at the optimal monopoly level, an increase in the price of the service. If the machine is already being priced at the optimal monopoly level, an increase in the price of the ink above the competitive level will raise the total price of the service to the consumer above the optimal monopoly level and will thereby reduce the monopolist's profits.").

[19] *Id.* at 927.

of inputs, and improving the design of the final product.[20] Not only is monopoly leveraging not a problem from this perspective, it is actually beneficial when it does occur. On this basis, the essential facilities doctrine has been criticized as discouraging efficiency-enhancing vertical integration.[21]

Recent scholarship has challenged the Chicago School's benign view of monopoly extension and contended that the single monopoly profit theorem holds under only a restrictive set of assumptions that often do not exist in real world markets. For purposes of the essential facilities doctrine, two assumptions of the Chicago School view may often not hold. First, the products in the two markets are assumed to be used in fixed proportions, which frequently may not be the case not be the case. [22] Second, the monopolized state of the noncompetitive market is also taken as given.[23] Because of its short-term focus on static efficiency, the single monopoly profit theorem ignores the possibility that monopoly leveraging may be used to fortify the adjacent monopoly. When these conditions are not satisfied, monopoly leveraging may be used for anticompetitive ends.[24]

A vertically-integrated owner of an essential facility can deny access to the asset or charging a higher price for access to firms in the dependent competitive market as part of a so-

[20] Steven C. Salop, *Economic Analysis of Exclusionary Vertical Conduct: Where Chicago Has Overshot the Mark, in* HOW THE CHICAGO SCHOOL OVERSHOT THE MARK: THE EFFECT OF CONSERVATIVE ECONOMIC ANALYSIS ON U.S. ANTITRUST 145 (Robert Pitofsky ed., 2008).
[21] *See* Reiffen & Kleit , *supra* note 8, at 437 ("Forcing the owner of an 'essential facility' to provide equal access seems to be misguided antitrust policy. In unregulated industries (with fixed-proportion technology), there is no anticompetitive incentive to integrate. So when foreclosure does occur, efficiency considerations are a likely motivation. The essential facilities doctrine, therefore, may discourage efficient behavior without a corresponding benefit in terms of deterring anticompetitive conduct.").
[22] *See* Einer Elhauge, *Tying, Bundled Discounts, and the Death of the Single Monopoly Profit Theorem*, 123 HARV. L. REV. 399, 404-05 (2009) (argues that monopoly leveraging through tying can often be anticompetitive, similar analysis can be applied to vertical foreclosure); Krattenmaker & Salop, *supra* note 13, at 234; Lao, *supra* note 9, at 588.
[23] *Id.* at 417-19.
[24] *Id.* at 404.

called raising rivals cost strategy. By depriving rivals of access to a key input or providing it on discriminatory terms, the upstream monopolist may force these firms to raise their prices in the competitive market. In the case of inputs that are true essential facilities, there are no equally cost-effective substitutes, at least in the short-term.[25] By being deprived of access to the essential facility or obtaining access at an inflated price, non-integrated firms are forced to use a less efficient mix of inputs and to raise the price of their final product as a result. The vertically-integrated firm thus can use its privileged position as the owner of an essential facility to weaken the competitive constraint it faces from other firms in the final product market and increase its own prices in turn.[26] Unlike predatory pricing strategies that require a short-term profit sacrifice to obtain a long-term gain, a raising rivals cost strategy can provide immediate payoffs.[27] This suggests that anticompetitive raising rivals cost strategies may be more prevalent than predatory tactics. Supporting this theoretical prediction, empirical evidence from the railroad industry, for example, reveals that vertical foreclosure does have adverse effects on consumer welfare, contrary to Chicago School predictions.[28]

[25] *See* Krattenmaker & Salop, *supra* note 13, at 234 ("The simplest and most obvious method by which foreclosure of supply can raise rivals' costs is the purchasers' obtaining exclusionary rights from all (or a sufficient number of) the lowest-cost suppliers, where those suppliers determine the input's market price. Competitors of the purchaser experience a cost increase as they necessarily shift to higher cost suppliers or less efficient inputs.").
[26] *See id.* at 229 ("A vertical agreement or merger may confer on the purchaser a power to raise price above the competitive level by effectively raising the costs of the purchaser's rivals. Where both these events occur – i.e., the competitors' costs increase and the purchaser thereby gains the ability to raise price – any version of the consumer welfare standard is violated.").
[27] Salop, *supra* note 9, at 143.
[28] *See* Curtis M. Grimm, Clifford Winston & Carol A. Evans, *Foreclosure of Railroad Markets: A Test of Chicago Leverage Theory*, 35 J.L. & ECON. 295, 301-05 (1992) (finding that even in the presence of a bottleneck railroad line between two points increasing competition on portions of the route raises consumer welfare); *infra* Part VI.A for more on structure of railroad industry.

Weakening rivals in the competitive market can also help fortify a monopoly position in the long-term.[29] Many facilities do not retain their essential quality indefinitely and so can ultimately be replicated. In many instances, firms may be able to enter linked markets sequentially but not simultaneously.[30] They can enter the competitive segment today and, once they have obtained a foothold in this market, potentially challenge the monopoly at a future date. Simultaneous entry into two markets may be more difficult because it involves higher barriers to entry.[31] By requiring new firms to enter two markets at the same time, the owner of the essential facility may be able to weaken or eliminate sources of potential competition.[32] Preventing entry in markets dependent on the essential facility may thus permit allow its owner to retain its monopoly for a longer period of time. Although the owner of the essential facility may not be able to stave off competition indefinitely, it may be able to postpone competition for a significant period of time. During this intervening time, the resulting harm to consumers may be substantial – an obvious cause for concern for antitrust enforcers and the courts.

[29] *See* Louis Kaplow, *Extension of Monopoly Power through Leverage*, 85 COLUM. L. REV. 515, 528-30 (1985) ("Bork's arguments often implicitly assume that the firm employing the [exclusionary] practice is not motivated by potential long-run effects on market structure. … [S]tatements concerning foreclosure typically look to the long-run effect on the market position of competitors. Arguments concerning the erection or maintenance of entry barriers also have been grounded explicitly in a dynamic context, as have more sophisticated arguments concerning reputation effects of practices by established firms, strategic position, and other effects on firms' costs.").
[30] *See* Michael L. Katz & Carl Shapiro, *Antitrust in Software Markets*, in COMPETITION, INNOVATION, AND THE MICROSOFT MONOPOLY: ANTITRUST IN THE DIGITAL MARKETPLACE 29, 70-71 (Jeffrey A. Eisenach and Thomas M. Lenard eds., 1999).
[31] Salop, *supra* note 27, at 147.
[32] *Id.* at 71.

III. EVOLUTION OF THE ESSENTIAL FACILITIES DOCTRINE

A. *Foundational Cases*

The Supreme Court has never officially recognized the doctrine nor used the term "essential facility."[33] Nonetheless, three rulings from the high court are widely seen as having established the functional foundations for the doctrine.[34] Its origin is typically traced to the 1912 Supreme Court case *United States v. Terminal Railroad Association*.[35] The defendant was a consortium of fourteen railroad companies that controlled all of the railroad bridges and terminals needed to access St. Louis, one of the major rail hubs in the Midwest.[36] It refused to grant bridge and switchyard access to non-affiliated railroads, effectively preventing them from serving St. Louis.[37] The Supreme Court observed that the topographic features of St. Louis and its environs made it infeasible for non-member railroads to construct their own bridges and terminals.[38] Furthermore, the Court observed that dividing the ownership of the river crossings,

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[33] *See Trinko*, 540 U.S. at 410-11 ("We conclude that Verizon's alleged insufficient assistance in the provision of service to rivals is not a recognized antitrust claim under this Court's existing refusal-to-deal precedents. This conclusion would be unchanged even if we considered to be established law the 'the essential facilities' doctrine crafted by some lower courts, under which the Court of Appeals concluded respondent's allegations might state such a claim. We have never recognized such a doctrine, and we find no need either to recognize it or to repudiate it here.").

[34] Lao, *supra* note 9, at 63-64.

[35] Areeda, *supra* note 7, at 842.

[36] *Terminal Railroad*, 224 U.S. at 390.

[37] *Id.* at 391-94.

[38] See *id.* at 397 ("St. Louis is a city of great magnitude in the extent of its area, its population, and its manufacturing and other business. A very large number of trunk line railroads converge in this city. In the brief of one of the well-informed counsel in this case it is said that St. Louis is one of the largest railroad centers in the world. Suppose it were required of every railroad company to effect its entrance to this city as best it could and establish its own terminal facilities, we would have a large number of passenger stations, freight depots and switch yards scattered all over the vast area and innumerable vehicles employed in hauling passengers and freight to and from those stations and depots. Or suppose it become necessary in the exigency of commerce that all incoming trains should reach a common focus, but every railroad company provide its own track; then not only would the expense of obtaining the necessary rights of way be so enormous as to amount to the exclusion of all but a few of the strongest roads, but, if it could be accomplished, the city would be cut to pieces with the many lines of railroad intersecting it in every direction, and thus the greatest agency of commerce would become the greatest burden.") (quoting State ex rel. Attorney Gen. v. Terminal Ass'n of St. Louis, 182 Mo. 284, 300 (1904)).

as the government desired, would be economically inefficient.[39] The Court's observations on the topography of St. Louis and the apparent economies of scale in maintaining unified ownership of the river crossings suggest that the facilities at issue had natural monopoly traits. Although not expressly describing the contested railroad facilities as essential, the Court's language indicates it viewed access to the facilities as being indispensable to serving St. Louis.[40] To remedy the problem, the Supreme Court held that the defendant had to admit all railroads as members and provide access to them on "just and non-discriminatory" terms.[41]

In *United States v. Associated Press*, the news agency was alleged to have improperly excluded non-member newspapers from carrying its wire reports.[42] The AP's bylaws required members to share all their news stories with other members but prohibited them from selling their stories to nonmembers.[43] The bylaws also permitted member newspapers to veto the admission of other papers from their home city.[44] Because no rival wire service provided the same scope of domestic and foreign news coverage as the AP, newspapers that could not obtain AP reports were at a serious competitive disadvantage.[45] Effectively treating AP wire reports as an essential facility, the Court affirmed the district court's decree that the AP could not adopt any bylaw to restrict competing non-member newspapers from obtaining its wire reports.[46]

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[39] *See id.* at 410-11 ("If, … , the violation of the statute, in view of the inherent physical conditions, grows out of administrative conditions which may be eliminated and the *obvious advantages of unification preserved*, [imposition of a non-discrimination requirement], will amply vindicate the wise purpose of the statute, and will preserve to the public a system of great public advantage.") (emphasis added).
[40] *See id.* at 398 ("The physical conditions which compel the use of the combined system by every road which desires to cross the river, either to serve the commerce of the city or to connect with lines separated by the river, is the factor which gives greatest color to the unlawfulness of the combination as now controlled and operated.").
[41] *Id.* at 411.
[42] 326 U.S. 1, 4 (1945).
[43] *Id.* at 9-10.
[44] *Id.*
[45] *Id.* at 13.
[46] *Id.* at 21.

Unlike in *Terminal Railroad* and *Associated Press*, in which assets owned by multiple firms were denied to rivals, the Court in *Otter Tail Power Co. v. United States* had to address the propriety of a single firm denying a downstream rival access to an alleged essential facility.[47] Otter Tail Power Co. was a vertically integrated utility serving parts of Minnesota and the Dakotas: It owned electric generation plants and retailed power to customers using its own transmission and distribution lines.[48] Some towns in Otter Tail's service area had terminated Otter Tail's exclusive franchise and sought to provide retail service through a municipally-owned cooperative.[49] To obtain power, they had to purchase it from various third-party generators and "wheel" it over Otter Tail's transmission lines.[50] Otter Tail, however, refused to allow the towns to access its transmission facilities.[51] The government alleged that Otter Tail denied the municipal retail cooperatives transmission access because it wanted to destroy them and reestablish its monopoly over its erstwhile service areas.[52] In affirming the district court's ruling that Otter Tail had monopolized the market for retail electric service, the Supreme Court found that Otter Tail had used its natural monopoly over electric transmission service to eliminate competition in the retail market.[53] By condemning unilateral conduct, *Otter Tail* stands for the proposition that the essential facilities claims while at times overlapping with concerted refusals-to-deal, as in *Terminal Railroad* and *Associated Press*, constitute a distinct basis for antitrust liability.

[47] 410 U.S. 366, 368 (1973).
[48] *Id.* at 369-70; *see infra* Part IV.A for more on structure of electric utilities.
[49] *Id.* at 371.
[50] *Id.* at 370.
[51] *Id.* at 371.
[52] *Id.* at 368.
[53] *Id.* at 378-79.

B. MCI *"Five-Factor" Test*

Remarkably, the essential facilities doctrine has not been precisely defined for most of its history. Scholars have criticized the doctrine for being so vague and amorphous, granting vast discretion to judges and providing little guidance to businesses.[54] The Seventh Circuit in the 1982 case *MCI Communications Corp. v. AT&T Co.* enumerated the four-prong test that forms the basis of an essential facility claim today.[55] A facility is essential and has to be shared only if all of the following conditions are satisfied:

(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.[56]

Factor four allows for efficiency defenses and ensures that the doctrine remains consistent with the consumer welfare prescription of modern antitrust.[57] While the *MCI* court did

[54] *See* Areeda, *supra* note 7, at 843 ("Imagine the torment Justice Frankfurter would feel to see his free-press public utility concept invoked in support of a rock impresario seeking admission to the local auditorium; a teletype machine marketer complaining that its competitor will not sell machines for it; a ski resort complaining that a rival resort will not engage in joint marketing with it…).
[55] MCI Comm'ns Corp. v. AT&T, 708 F.2d 1081 (7th Cir. 1982).
[56] *Id.* at 1131-32.
[57] *See, e.g.*, Pitofsky et al., *supra* note 9, at 450 ("[T]he final factor enumerated in the MCI Communications rule – feasibility of providing access to competitors – makes evidence that the essential facilities doctrine is 'carefully delimited: the antitrust laws do not require that an essential facility be shared if such sharing would be impractical or would inhibit the defendant's ability to serve its customers.' Thus, the essential facilities doctrine does not impose liability where a defendant monopolist has a legitimate business (or technological) justification for declining access to the disputed assets to its competitor.") (quoting Hecht v. Pro-Football, Inc., 570 F.2d 982, 992-92 (D.C. Cir. 1977); City of Anaheim v. Southern Cal. Edison Co., 955 F.2d 1373, 1381 (9th Cir. 1992) ("If the Pacific Intertie [a major transmission line running from Oregon-Washington state line to Southern California] were an essential facility, Edison could still deny access if it had legitimate business reasons for that denial. The district court properly found that Edison did. … Edison had a limited right to use the capacity of the Pacific Intertie, and it desired to use that capacity to the limit when it could get inexpensive power from the Pacific Northwest. Thus, it refused to give

not enumerate a fifth factor in the test, it held that the doctrine also requires that the claimed essential facility be a necessary input in a *distinct, vertically-related market*.[58] This is an important limitation on the doctrine: Requiring a firm to share its assets with a firm in the same stage of production within an industry would undermine incentives to invest.[59] Firms would be allowed to appropriate the investments of their stronger rivals. For instance, General Motors, even if it could implausibly satisfy the first four *MCI* factors, would not be able to bring a successful claim to use the manufacturing facilities of Toyota – a horizontal competitor – regardless of the efficiency advantages Toyota may enjoy.

C. *Status of the Doctrine in the Wake of* Trinko

If *Otter Tail* represents the high-water mark of the essential facilities doctrine in the Supreme Court, the Court's more recent decision in *Verizon Communications, Inc. v. Law Offices of Curtis V. Trinko* represents a nadir. The Telecommunications Act of 1996 ("1996 Act") imposed an assortment of regulatory duties on incumbent local telephone monopolies, including the obligation to share portions of their network with firms seeking to enter the market for local phone service.[60] In *Trinko*, the plaintiff, representing customers of a new local phone provider, filed suit against Verizon, the incumbent in the Northeastern United States, alleging

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the Cities firm access because it could not transmit all of the power it wanted if a portion of its capacity rights were being used by the Cities at the same time.").

[58] *See MCI*, 708 F.2d at 1132 ("A 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 to another. Thus, the antitrust laws have imposed on firms controlling an essential facility the obligation to make the facility available on non-discriminatory terms."); 3A PHILLIP E. AREEDA & HERBERT HOVENKAMP, ANTITRUST LAW ¶ 771a (2d ed. 2002) ("It should be clear that the essential facility doctrine concerns vertical integration – in particular, the duty of a vertically integrated monopolist to share some input in a vertically related market, which we call market #1, with someone operating in an upstream or downstream market, which we shall call market #2. If the facility is truly 'essential,' then the #1 monopoly facility also establishes a #2 monopoly.").

[59] *See* Paul D. Marquardt & Mark Leddy, *The Essential Facilities and Intellectual Property Rights: A Response to Pitofsky, Patterson, and Hooks*, 70 ANTITRUST L.J. 847, 855-59 (2002-2003) (explaining why granting firms access to intellectual property of horizontal rivals would undermine competitive dynamic).

[60] *Trinko*, 540 U.S. at 401.

that its failure to fulfill sharing obligations was a violation of Section 2 of the Sherman Act.[61] The Supreme Court ruled that the 1996 Act, while it created a *regulatory duty* to share vital telecommunications assets that the Federal Communications Commission (FCC) and state public utility regulators were to enforce, did not create an analogous *antitrust duty* to share.[62] Although the facts of the case were reminiscent of an essential facilities claim, the Court did not officially take a position on the continued vitality of the doctrine.[63] In wide-ranging dicta, however, Justice Scalia's majority opinion questioned the economic underpinnings of the doctrine. His opinion praised the benefits of monopoly and stated that the prospect of monopoly profits is "what attracts 'business acumen in the first place… [and] induces risk taking that produces innovation and economic growth."[64] As a corollary to the benefits of monopoly, *Trinko* criticized the notion of requiring a monopolist's to share its "fruits" with rivals.[65] In addition, the Court stated that compelled sharing of assets requires courts to act as price regulators and may even foster collusion between the monopolist and the firm seeking access.[66]

In spite of its pro-monopoly dictum, *Trinko* produced a ruling narrower than appearances may suggest. The opinion expressly did not question the Court's earlier rulings in *Otter Tail* or *Aspen Ski Co. v. Aspen Highlands*,[67] a controversial imposition of a duty-to-deal,[68] and that it

[61] *Id.* at 403.
[62] *Id.* at 415-16.
[63] *Id.* at 410.
[64] *Id.* at 407.
[65] *Id.*
[66] *Id.* at 407-8.
[67] *Id.* at 409-10.
[68] 472 U.S. 585 (1985) (requiring owner of three of the four ski mountains in Aspen, Colorado to offer a joint ticket with owner of the fourth mountain); s*ee* Lao, *supra* note 9, at 570 ("[A] coherent principle for invoking the [essential facilities] doctrine [in the Tenth Circuit decision] was noticeably missing. True, the defendant controlled three of the four mountains in Aspen; regulatory restrictions prohibited the development of a new ski mountain there; the plaintiff access to the 'facility' to be a viable competitor; and access was feasible as evidenced by the previous, immensely successful multi-mountain, multi-day ticket. Thus, under the MCI test, the Tenth Circuit's reliance on the doctrine was probably defensible. But one does not get a sense of what *fundamentally* made the

maintains an agnostic view of the essential facilities doctrine.[69] The language of *Trinko* suggests that even in regulated sectors refusal-to-deal claims under the antitrust laws are not foreclosed; rather when determining whether antitrust immunity should be granted the existence of regulatory oversight is important but not dispositive on its own.[70] While the implications and the reach of the opinion have been widely debated, a plain reading of *Trinko* suggests that the essential facilities doctrine survives. Perhaps most importantly, regardless of Justice Scalia's true intent in *Trinko*, the lower courts continue to treat refusals-to-deal as valid grounds for a Section 2 claim under the essential facilities doctrine and otherwise even when regulatory oversight is present.[71] This appears to be consistent with lower court jurisprudence in the wake of other landmark Section 2 rulings from the Supreme Court; the courts appear to treat Supreme Court precedents as providing guidelines rather than formulating bright-line rules.[72]

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facility essential–the ski mountains or the joint ticket? Criticism of the doctrine as it was applied by the Tenth Circuit thus seems justified. And, the Supreme Court was probably wise to sidestep the doctrine on other grounds.").

[69] *Trinko*, 540 U.S. at 409 ("*Aspen Skiing* is at or near the outer boundary of § 2 liability."); *see id.* at 410 ("This conclusion would be unchanged even if we considered to be established law the "essential facilities" doctrine crafted by some lower courts, under which the Court of Appeals concluded respondent's allegations might state a claim, and we find no need either to recognize it or to repudiate it here").

[70] *See id.* at 412. ("*One factor* of particular importance is the existence of a regulatory structure designed to deter and remedy anticompetitive harm. Where such a structure exists, the additional benefit to competition provided by antitrust enforcement will tend to be small, and it will be less plausible that the antitrust laws contemplate such additional scrutiny. Where, by contrasts, there is nothing built into the regulatory scheme which performs the antitrust function, the benefits of antitrust are worth its sometimes considerable disadvantages.") (emphasis added).

[71] *See e.g.*, MetroNet Servs. Corp. v. Qwest Corp., 383 F.3d 1124, 1129-30 (9th Cir. 2004) (recognizing doctrine but finding it inapplicable on facts), *cert. denied*, 544 U.S. 1049 (2005); Nobody in Particular Presents, Inc. v. Clear Channel Communs., 311 F. Supp. 2d 1048, 1113 (D. Colo. 2004) (applying essential facilities analysis and distinguishing *Trinko* because refusal to engage in commercially beneficial conduct could reasonably support a jury's verdict that the defendant radio network that also promoted rock concerts had "sacrificed short-term gains in the hopes of destroying other promotes and reaping long-term monopolistic profits"); Stand Energy Corp. v. Columbia Gas Transmission Corp., 373 F. Supp. 2d 631, 641 (2005) ("Generally, a refusal to cooperate with rivals is a matter of right, but there are limited exceptions. Where that refusal to cooperate is predicated on anticompetitive goals, antitrust law may restrict the right. … Though FERC regulates the rates for transporting and selling natural gas in interstate commerce, Defendants have not demonstrated that this case involves the same level of regulatory overlay and unique market found in *Trinko*.").

[72] J. Thomas Rosch, *The Common Law of Section 2: Is It Alive and Well?*, 15 GEO. MASON L. REV. 1163 (2007).

IV. "TANGIBLE" ESSENTIAL FACILITIES

For most of its history, the essential facilities doctrine has been applied to physical assets that possess natural monopoly characteristics. Such essential facilities include the railroad bridges in *Terminal Railroad*, the electric transmission lines in *Otter Tail*, and the telecommunications infrastructure in *Trinko*. While natural monopolies continue to exist in the economy, courts should be wary of applying the essential facilities doctrine to these assets. For the natural monopoly assets that need to be accessed by competitors in related markets, specialized federal agencies have become de facto enforcers of the essential facilities doctrine and established open access regimes over these assets. In addition to creating duplicating administrative efforts, judicial mistakes in applying the doctrine can adversely affect the incentives to invest and innovate. In the context of tangible assets, the essential facilities doctrine should be confined to idiosyncratic assets that have natural monopoly characteristics and are not subject to any governmental oversight.[73]

A. Specialized Federal Agencies Serve as De Facto Enforcers of the Doctrine

While Professor Areeda sharply criticized the essential facilities doctrine, he nonetheless believed it had economic value under certain limited circumstances. He thought that the Seventh Circuit in *MCI* and the Supreme Court in *Otter Tail* had reached the correct outcomes because of the natural monopoly quality of the assets at issue.[74] The "delivery infrastructure" in many

[73] *See, e.g.*, Hecht v. Pro-Football, Inc., 570 F.2d 982, 992-93 (D.C. Cir. 1977) (treating RFK Stadium, home of the National Football League's Washington Redskins, as an essential facility that was improperly denied to a prospective rival football franchise); McKenzie v. Marcy Hosp. of Independence, 854 F.2d 366, 368-71 (10th Cir. 1988) (finding that defendant-hospital was not an essential facility because plaintiff provided medical services even without access to hospital and thus failed to satisfy factor one of *MCI* test); Posner, *supra* note 2, at 368-69 ("[I]f a market is small enough, almost any kind of firm can have a natural monopoly – a grocery store in a village, for example – because every firm has some fixed costs, and they may dominate total costs if demand is low enough.").
[74] *See* Areeda, *supra* note 7, at 845, 848.

industries is still considered a natural monopoly, and as such its owner can leverage its monopoly power to adjacent markets. If the plaintiff in *MCI* wanted to enter the long-distance telephone market, for example, it had to obtain access to the defendant's local loops. Likewise, the plaintiff in *Otter Tail* had no means of purchasing wholesale power unless it had access to the defendant's transmission lines. The regulatory landscape, however, has changed dramatically since Professor Areeda wrote his article at the end of the 1980s. In the intervening twenty years, comprehensive regulatory schemes have been established to ensure that the owners of essential facilities cannot use them to handicap rivals in adjacent markets. With the creation of these new "open access" obligations, application of the essential facilities is superfluous in the four principal industries – electricity, natural gas, telecommunications and railroads[75] – with natural monopoly segments.

The electricity utility industry is composed of four discrete processes: Generation, transmission, distribution and retailing.[76] Electricity in the United States is generated principally using coal, natural gas, nuclear fission, water and wind,[77] transmitted over high-voltage lines that sometimes stretch over hundreds or even thousands of miles, stepped down to lower voltages near the point of consumption and retailed to customers over distribution lines. Transmission and distribution are still considered natural monopolies while retailing and generation are considered conducive to competition.[78] Competition in the generation sector is considered particularly beneficial because it creates incentives for more efficient medium-term operation and long-term

[75] Paul L. Joskow & Roger G. Noll, *The Bell Doctrine: Applications in Telecommunications, Electricity, and Other Network industries*, 51 STAN. L. REV. 1249, 1250 (1998-1999).
[76] Paul L. Joskow, *Restructuring, Competition and Regulatory Reform in the U.S. Electricity Sector*, 11 J. ECON. PERSPECTIVES 119, 121 (1997).
[77] Electric Power Annual – Existing Capacity by Energy Source, http://www.eia.doe.gov/cneaf/electricity/epa/epat1p2.html (last visited Apr. 23, 2010).
[78] *Id.* at 120.

investment decisions.[79] Because the transmission grid is a natural monopoly,[80] however, a vertically-integrated utility owning both transmission and generation can deny transmission access to independent generators or provide transmission access on highly unfavorable terms to increase the profits of its own generation facilities.[81] To prevent this problem, three principal "fixes" have been imposed. First, some states have required transmission owners to divest all generation assets to prevent any possibility of them manipulating transmission access to benefit affiliated generation.[82] Second, in parts of the country, operational control, although not ownership, of the transmission grid has been transferred to a not-for-profit regional transmission organization.[83] These entities exercise day-to-day control of the transmission grid, operate wholesale electricity markets, and oversee planning for new transmission investments. [84] Once deprived of the control of their transmission assets, vertically-integrated utilities cannot use their facilities to disadvantage rival generators. Third, the Federal Energy Regulatory Commission (FERC) has issued Orders 888 and 889 pursuant to the Energy Policy Act of 1992 mandating that vertically-integrated utilities functionally separate their generation, transmission and distribution business and provide transmission access to all generators on non-discriminatory terms.[85] The FERC regulates transmission lines as a natural monopoly and establishes cost-of-service rates that all users pay.[86] While the structural separation approach is considered more

[79] *Id.* at 124-25.
[80] The transmission grid is not merely transportation network like a "highway of electrons" but rather a system that must balance supply from all generating facilities in a given geographic area with the demand at every moment in time. *See* Joskow & Noll, *supra* note 75, at 1303.
[81] Joskow, *supra* note 76, at 132.
[82] *Id.* at 132-33.
[83] *Id.* at 133.
[84] *Id.*
[85] *Id.* at 133.
[86] *Id.*

effective than the other two fixes,[87] all three remedies greatly diminish the ability of transmission owners to handicap unaffiliated competitors in the generation sector.

Bearing some structural similarity to electricity, the natural gas industry also has four stages in its supply chain: Production, wholesaling, transmission, and distribution.[88] The production stage is comprised of the exploration, production and gathering of gas and has generally had low levels of market concentration.[89] Transmission involves the shipping of gas from the "wellhead" to the "city-gate" and can possess natural monopoly qualities.[90] Remarkably, twenty interstate pipelines transport about 80% of the natural gas consumed in the United States.[91] Local distribution companies ("LDCs") purchase gas at the city-gate and supply it to residential, commercial and industrial customers.[92] During the mid-twentieth century, pipelines often vertically-integrated into wholesaling through contractual means.[93] The Federal Power Commission imposed ceiling on wellhead prices, [94] which likely meant that the degree of competition among gas producers was considered less important. In the late-1970s in response to growing gas shortages, policymakers lifted price restrictions and sought to inject more competition in the production of natural gas.[95] To prevent pipeline operators from leveraging

[87] *Id.*
[88] Michael J. Doane & Daniel F. Spulber, *Open Access and the Evolution of the U.S. Spot Market for Natural Gas*, 37 J. L. & ECON. 477, 479 (1994).
[89] *Id.* at 480.
[90] *See* Joskow & Noll, *supra* note 75, at 1293-94 ("The segment that is most plausibly a natural monopoly is local distribution. While pipelines typically exhibit economies of scale, multiple pipelines from different fields to the same locality, or over different routes (monopolistically supplying some communities along the way) from the same field that end in the same region, sometimes can create competition in this segment.")
[91] Doane & Spulber, *supra* note 88, at 479.
[92] *Id.*
[93] *See* Thomas P. Lyon & Steven C. Hackett, *Bottlenecks and Governance Structures: Open Access and Long-Term Contracting in Natural Gas*, 9 J. L. ECON. & ORG. 380, 386-87 (1993) (reviewing institutional features of natural gas industry).
[94] *Id.* at 386.
[95] *See id.* at 386-87 ("By the 1970s, price regulation was causing serious shortages in the interstate gas market, and in 1978 the U.S. Congress attempted to remedy this problem by passing the Natural Gas Policy Act (NGPA). The

their monopoly into the upstream market and stifling incipient competition,[96] FERC issued Order 436, which required pipelines offering unbundled transportation service to do so on a non-discriminatory basis.[97] Even after reforms to separate pipeline transportation from wholesaling, non-integrated gas producers alleged that the pipeline owners discriminated against them, suggesting that the pipeline monopoly was being used to reduce competition at the wellhead.[98] In 1992, FERC issued Order 636, requiring pipeline owners to "unbundle" of gas sales and shipping and provide open access to all sellers and purchasers.[99] With the new regulatory mandates, producers and LDCs have assumed the wholesaling function at the expense of pipeline operators.[100] While pipelines are still likely natural monopolies, the FERC's open access obligations ensure that the benefits of a competitive upstream market flow to downstream users.[101]

At its most basic level, a telecommunications network consists of exchange facilities and the local loops – copper and fiber optic cables – that run from exchange facilities to customer premises.[102] Historically, the entire industry was treated as a natural monopoly.[103] Until its landmark breakup in 1984, AT&T was the national telecommunications monopoly and provided

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NGPA divided the wellhead market into a complex set of categories with different price ceilings that escalated over time. Price ceiling for categories such as "high cost" gas were high enough to induce substantial new exploration and development, and new contracts often indexed the highest applicable NGPA price ceiling.").

[96] *See* Kearney & Merrill, *supra* note 10, at 1344 ("[Pipelines] were able to use their monopoly power over gas transportation to create and to maintain monopsony power in the market for the purchase of gas at the wellhead and monopoly power in the market for the sale of gas to LDCs.").

[97] Lyon & Hackett, *supra* note 93, at 387.

[98] *See id.* ("While FERC's open access program was largely successful for interruptible supply, a growing chorus of complaints eventually made clear to FERC that the provision of firm supply and transportation was a much more complex task. One key concern was the pipelines were unduly favoring their own gas supply affiliates in developing transportation requirements.").

[99] Doane & Spulber, *supra* note 88, at 477.

[100] *Id.* at 488.

[101] *Id.* at 514.

[102] Howard A. Shelanski, *Adjusting Regulation to Competition: Toward a New Model for U.S. Telecommunications Policy*, 24 YALE J. ON REG. 55, 58 (2007).

[103] Douglas Lichtman & Randal C. Picker, *Entry Policy in Local Telecommunications: Iowa Utilities and Verizon*, 2002 SUP. CT. REV. 41, 68 (2002).

local and long-distance service and telephone equipment to virtually all Americans.[104] The breakup of the company came in the wake of its long-running disputes with new entrants like MCI, which had demonstrated that certain segments of the industry like long-distance service were conducive to market competition.[105] Local phone service was still thought to be a natural monopoly.[106] The purpose of the AT&T divestiture was to prevent the owner of the local infrastructure from leveraging its monopoly into the long-distance and equipment markets.[107] This remedy was analogous to the structural separation of electric generation and transmission mandated in certain states.

The Telecommunications Act of 1996 (1996 Act) took a further step away from the natural monopoly model of telecommunications and sought to promote competition in the local phone market.[108] The 1996 Act recognized, however, that new entrants in the local market faced two significant barriers to entry. First, telephone networks are characterized by network externalities: The value of the network to each user increases as more users join it.[109] A network with a million subscribers is more attractive to customers than a network with only a thousand users. Because of these network externalities new entrants cannot compete successfully unless they can connect with all of the existing customers of the incumbent firms.[110] The 1996 Act requires all incumbent telephone companies to interconnect with all new entrants.[111] In other words, a customer of a new phone company must be connected to every other phone subscriber

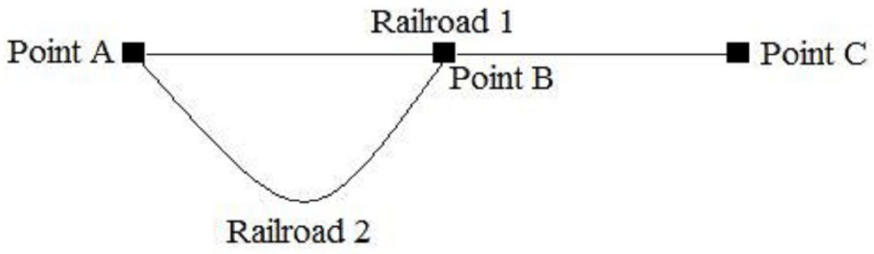
[104] Shelanski, *supra* note 102, at 61.
[105] *Id.* at 62.
[106] *Id.*
[107] *Id.*
[108] *Id.* at 62-63.
[109] Ingo Vogelsang, *Price Regulation of Access to Telecommunications Networks*, 41 J. ECON. LITERATURE 830 (2003); *see infra* Part V.A.ii.
[110] *Id.* at 831.
[111] Shelanski, *supra* note 102, at 63.

in the country. The second major obstacle to entry was thought to be the natural monopoly quality of the local loops that connect the incumbent phone company's exchange facilities to customer homes and offices.[112] To allow new firms to enter the local phone market and to prevent the local phone monopoly from leveraging its control over local loops, the 1996 Act directs the FCC to compel the sharing of local loops, which are known as unbundled network elements (UNEs).[113] The FCC is authorized to determine what UNEs need to be shared and on what exact terms – the same duties thrust on the judiciary in *MCI*.[114]

As *Terminal Railroad* illustrates, certain segments of the railroad industry may have natural monopoly characteristics. Broadly speaking, railroads provide two services: They build and maintain tracks and operate trains over them.[115] Until the early 1980s, the Interstate Commerce Commission (ICC) set railroad rates.[116] Since then, most railroad rates have been deregulated and are now set by market forces.[117] In this environment, one particular source of contention has been the alleged abuse of bottleneck rail lines, which are segments of track between two points that are not served by parallel railroad lines or alternative modes of transportation.[118] Anticompetitive vertical foreclosure can arise when a bottleneck exists on part of the route between two points. The following hypothetical demonstrates this potential problem. As shown in Figure 1, Railroad 1 and Railroad 2 compete to serve traffic from Point A to Point B but only Railroad 1 is capable of serving Point B to Point C.[119] Railroad 1, as part of a raising rivals cost strategy, may have an incentive to weaken the competition it faces from Railroad 2 on

[112] *Id.*
[113] *Id.*
[114] *Id.*
[115] Salvatore Massa, *Injecting Competition in the Railroad Industry Through Access*, 27 TRANSP. L.J. 1, 31 (2000).
[116] Fritz R. Kahn, *Railing at Railroads*, 28 TRANSP. L.J. 1, 2 (2000-2001).
[117] *Id.*
[118] Joskow & Noll, *supra* note 75, at 1295.
[119] Massa, *supra* note 115, at 4-6.

Figure 1



the route between Point A and B.[120] Railroad 1 may deny "interlining" rights to Railroad 2 on Point B to C or charge Railroad 2 higher interlining rates. In response to the higher cost of interlining, Railroad 2 may have to set higher rates for moving goods from Point A to B or A to C. Facing reduced competition from Railroad 2 between Points A and B, Railroad 1 may then be empowered to increase its rates along the entire route.[121] The Surface Transportation Board (STB), which succeeded the ICC and is entrusted with regulating railroads, has multiple regulatory powers at its disposal to prevent vertically-integrated bottleneck railroads from leveraging their monopoly power onto competitive lines. The STB can order the bottleneck railroad: 1) to ship the freight of the interlining carrier, 2) to grant track access to the interlining railroad, and 3) to move the cars of the interlining railroad over its network.[122]

Open access regimes in the four principal industries with natural monopoly traits – electric transmission, natural gas pipelines, telecommunication local loops and bottleneck railroads – largely obviate the need for continued application of the essential facilities doctrine. Federal and state regulators have created sharing obligations to prevent the owners of essential

[120] *Id.* at 5-6.
[121] *Id.*
[122] *Id.* at 14-15.

facilities from extending their monopoly power into adjacent markets where competition would otherwise exist.

B. Preserving the Doctrine as a "Backstop" to Regulatory Failure Is Imprudent

While regulators are now entrusted to enforce open access requirements over traditional natural monopolies, the courts, by applying the essential facilities doctrine to these assets, could serve to protect against agency failures and thus enhance consumer welfare. The costs from such administrative duplication, however, would likely exceed the resulting benefits. Judicial resources may be expended on a task that administrative bodies are already performing in a satisfactory manner. Antitrust intervention may also raise the possibility of institutional conflict between federal courts and regulators. The pricing of natural monopolies is likely to be complex because most of these assets have not been shared in a market setting and so the baseline for an appropriate price may be difficult to ascertain.[123] The history of asset sharing in the telecommunications sector suggests that computing the correct term of access is difficult even for specialized industry regulators and would be likely to tax the institutional capacity of the judiciary.[124] The costs of administrative errors can be substantial: Setting unduly low terms of access can seriously distort economic decisions and ultimately harm consumers. On top of the difficulty of computing the price of access, courts would have to set up monitoring schemes to

[123] *See* Philip J. Weiser, *The Relationship of Antitrust and Regulation in a Deregulatory Era*, 50 ANTITRUST BULL. 549, 559-60 (2005) ("One area where regulatory agencies undoubtedly possess superior competence over antitrust courts is in the area of managing complex access arrangements. In the few cases where courts have waded into such matters, the experiment underscored that courts are not well-suited to manage such administration. Notably, New Zealand ultimately abandoned its effort to charge courts with ensuring reliable cooperation between incumbents and new entrants on matters such as interconnection arrangements. As Judge Easterbrook put it, courts are inherently ill-suited for such a role both because they lack the ability to gather the necessary information, the expertise to process it, and do not face a reward structure that holds them accountable for the results of their quasi-regulatory efforts.").

[124] *See, e.g.*, Joskow & Noll, *supra* note 75, 1283 (describing the conceptual and empirical difficulties in accurately computing access costs for telecommunication interconnections).

ensure that scarce resources are being shared in conformance with its decree.[125] Even in instances of likely regulatory capture, judicial intervention may not be an inappropriate solution. Application of the essential facilities doctrine in such cases, while perhaps keeping regulatory bodies honest, may reintroduce the administrative burdens that market liberalization was intended to reduce.

Evidence from the telecommunications industry illustrates how designing sharing obligations is challenging and how regulatory missteps can discourage investment and reduce innovation. Under the Telecommunications Act of 1996, new firms in the local telephone market had two primary means of entry: 1) Use the UNEs of incumbent carriers or 2) invest in their own facilities.[126] The sharing obligations were premised on the belief that certain portions of the telecommunications network were natural monopolies, analogous to electric transmission lines, and ought to be subject to open access requirements.[127] The provision of telecommunications service using cable and voice-over-internet-protocol (VoIP) technologies suggests that the natural monopoly assumption may have been wrong.[128]

Just as importantly as the erroneous assumption of natural monopoly, the FCC used an economically questionable method of computing the terms of sharing UNEs. The FCC and the

[125] *See e.g.*, *City of Anaheim*, 955 F.2d at 1376 (dispute arising partly from which party was entitled to use limited transmission resources to ship cheap power from Pacific Northwest).
[126] Shelanski, *supra* note 102, at 75.
[127] *Id.* at 69.
[128] *See id.* at 73-4 (""[C]able modem competition and broadband penetration more generally has helped to drive a wedge between voice telephone service and the physical infrastructure over which it runs. For decades, voice service was uniquely connected with the underlying telephone network. Some more recent services like cable telephony (switched telephone service running over cable plant) similarly require the service provider to own, or purchase access to a physical network to provide voice service. With the rise of broadband Internet access, however, a set of voice communication providers has arisen that owns no network infrastructure at all and instead provides voice service as an application that consumers can reach over the Internet. Such voice-over-Internet-protocol (VoIP) services, like wireless providers, provide a voice option that does not always, but can and often does, entirely bypass the incumbent local telephone networks.").

state regulators that directly implemented its rules relied on total element long-run incremental costs (TELRIC) in pricing UNE access to new entrants.[129] This price included a reasonable return on equity but it failed to adequately compensate the incumbent phone monopolies for the ex ante risk they had assumed when investing in new facilities.[130] In the newly competitive market environment, firms ran the risk that new services and technologies would not be popular with customers and that the subsequent revenues would not be sufficient to recover upfront costs. In other words, firms would have to bear the losses rather than pass the costs of the failed investment through to customers like they did in the old regulated environment. With the FCC's sharing requirements, new entrants, however, did not have to take a similar risk.[131] Instead, they could wait and see whether the new technology was successful and, if it was, then decide to access the relevant facilities at TELRIC prices.[132] This riskless "option," by allowing new entrants to cherry pick the successful new technologies of incumbents, encouraged them to postpone investing in their own facilities. In response to this ease of appropriation by rivals, incumbent providers may have scaled back their new investments.[133] In fact, empirical evidence supports the hypothesis that TELRIC pricing distorted investment decisions and reduce innovation in the telecommunications industry over both the short- and long-term.[134]

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[129] Michael A. Heller, *The UNE Anticommons: Why the 1996 Telecom Reforms Blocked Innovation and Investment*, 22 YALE J. ON REG. 275, 282 (2005).
[130] *Id.*
[131] *Id.* at 284.
[132] *Id.*
[133] *Id.* at 284-85.
[134] *See* Robert W. Crandall et al., Do Unbundling *Policies Discourage CLEC Facilities-Based Investment?*, 4 TOPICS IN ECON. ANALYSIS & POL'Y 1, 20 (2004) ("Our results demonstrate that the share of CLEC lines that are facilities-based is lower in states where the UNE rental rates are lower, which suggests that unbundling decreases facilities-based competition in the short term. That model cannot rule out the possibility, however, that low UNE rates encourage CLECs to rent at first, and then build facilities once they have some market experience. But the notion that low UNE rates stimulate future facilities-based investment appears to be undermined by other results. In particular, a regression of the change in facilities-based investment over time indicates that facilities-based lines growth relative to UNE growth was faster in states where the cost of UNEs was higher relative to the cost of

Changes in telecommunications policy over the past five years further support the hypothesis that the UNE sharing obligations, as implemented, had deleterious incentive effects. In 2005, the FCC admitted that the states' regulated prices of UNEs might have been too low.[135] With relaxed regulatory obligations, new entrants have increasingly invested in their own facilities instead of relying on the incumbents' infrastructure.[136] While perhaps hyperbolic, one scholar has claimed that the FCC's flawed implementation of the Telecommunications Act of 1996 may be responsible for the United States' relative backwardness in telecommunications service compared to other developed nations.[137] To compound the adverse incentive effects, the FCC's sharing obligations also spawned massive amounts of litigation that likely distracted firms from the marketplace.[138] If the courts had imposed antitrust liability under the essential facilities doctrine in cases like *Trinko*, they would have only been perpetuating prior policy mistakes.

Even in the railroad industry where the STB's performance has been viewed as unsatisfactory, antitrust intervention using the essential facilities doctrine is not the correct remedy. Vertical foreclosure is admittedly a serious threat to railroad competition. Industry

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facilities-based investment."); Allan T. Ingraham & J. Gregory Sidak, *Mandatory Unbundling, UNE-P, and the Cost of Equity: Does TELRIC Pricing Increase Risk for Incumbent Local Exchange Carriers?*, 20 YALE J. ON REG. 389, 405-6 (2003) (""We have tested the hypothesis that mandatory unbundling would increase the volatility of the ILECs' stock returns during times of recession and therefore increase the ILECs' equity costs. Different time periods and market indexes were used in the analysis to confirm that the results were robust. We find that BellSouth and Verizon experienced statistically significant increases in their equity costs during the recession. BellSouth's costs of equity rose by between 2.37 and 4.13 percentage points, while Verizon's equity cost increased by between 1.78 and 2.36 percentage points. The analysis also indicates that SBC's equity costs rose by as much as 1.59 percentage points, but that this increase was not generally significant in a statistical sense. These empirical findings support the … hypothesis that mandatory unbundling at TELRIC prices has decreased the ILECs' incentives to invest in their own networks.").

[135] Shelanski, *supra* note 102, at 75

[136] *Id.*

[137] *See* Heller, *supra* note 129, at 287 ("The United States is losing its competitive edge in telecommunications in part because of FCC mistakes in fragmenting property rights during the reform of local telephone service. Forcing ILECs to share their facilities with CLECs proves costly to all. Replacing market prices with regulated rates pushes all the players to focus on rent-seeking rather than competition. Each seeks to cannibalize the resources of the others, shrinking and redistributing the pie.").

[138] *Id.* at 285.

practices may encourage bottleneck railroads from foreclosing rivals in competitive segments.[139] Furthermore, anecdotal evidence, including persistent complaints of poor market performance,[140] suggests that railroads owning bottleneck lines have, in fact, sought to foreclose rivals.[141] In spite of the possible and realized threat of vertical foreclosure, the STB has refrained from intervention.[142] Despite the agency's unsatisfactory performance, judicial correction of regulatory mistakes is likely not the right solution to insufficient competition in certain markets. Mandating access to certain lines may improve the competitive landscape of the railroad industry; it could, however, also reintroduce many of the burdensome administrative obligations that contributed to a slew of railroad bankruptcies in the 1970s and erode certain operational efficiencies.[143] In hindsight, the lack of competition in certain railroad markets may be the

[139] *See* Massa, *supra* note 115, at 8 ("[A] bottleneck railroad may prefer to foreclose an interlining competitor to prevent it from gaining knowledge about a customer. While the bottleneck railroad may earn the same or greater short-run profits by interlining in that particular market, the customer may need service in other markets where the bottleneck and the rival compete more directly. By withholding information from the interlining railroad, the bottleneck carrier may attempt to keep an exclusive relationship with the customer to prevent future competitive threats or customer leverage in other markets. Similarly, other strategic reasons, such as the desire to weaken the interlining competitor to gain additional market power in other markets, may also act as an incentive for foreclosure.").

[140] *See, e.g.*, Alex Roth, *Rail Shippers Ask Congress to Regulate Freight Prices*, WALL ST. J., Jan. 5, 2009, B1.

[141] *See* Massa, *supra* note 115, at 8-9 ("[P]rior to a merger, Southern Pacific and Wisconsin Central provided interlined competition against Union Pacific for the movement of taconite pellets from mines in Minnesota to a steel manufacturer in Utah. Because the railroads provided an innovative service by backhauling coal to the Midwest, they were able to compete effectively with the single-line service of Union Pacific. After Southern Pacific merged with Union Pacific, this service was eliminated and the Union Pacific now provides single-line service. In another recent, and perhaps extreme example of such behavior, Union Pacific sought to divert its traffic onto ships to relieve network congestion rather than give the freight to a rival railroad.").

[142] *Id.* at 19-21.

[143] *See* Massa, *supra* note 115, at 23 ("[R]egulations that enhance competition provide a means of off-setting the undesirable effects of deregulation. However, the cure may often prove worse than the disease, especially in situations where increased regulation imposes administrative costs for the regulatory agency and regulatory costs for the industry. Burdensome regulatory policies in the 1970s played a significant role in the financial decline of the railroad industry."); John D. Bitzan, *Railroad Costs and Competition: The Implications of Introducing Competition to Railroad Networks*, J. TRANSP. ECON. & POL'Y 201, 222-24 (2003) ("In examining the cost implications of railroads competing over one rail network, the study finds: (1) that there are economies associated with vertically integrated roadway maintenance and transport, suggesting that separating the two would result in increased resource costs, and (2) railroads are natural monopolies in providing transport services over their own network, suggesting that multiple-firm competition over such a network would result in increased resource costs. These findings suggest that policies introducing railroad competition through 'open access' or on bottleneck segments would not be

product of lax merger policy. The STB likely erred in clearing certain railroad mergers that allowed owners of bottleneck lines to vertically integrate with railroads in competitive markets.[144] Retrospective market effects analysis suggests that the STB approved mergers that were probably, on net, anticompetitive.[145] More careful scrutiny of mergers and blocking anticompetitive deals could have prevented mergers that regulation – whether from federal agencies or courts – cannot adequately police after the fact.

Perhaps somewhat ironically, the unsatisfactory performance of regulatory agencies in the telecommunications and railroad industries counsels caution on the part of antitrust courts. The difficulty the FCC and state regulatory bodies have had in setting terms for sharing UNEs suggests that courts would face similar, if not greater, challenges. The FCC and industry-specific regulators have large staffs with specialized knowledge of their particular industry.[146] Courts, in contrast, must rely on generalist judges and clerks. Most of these individuals presumably lack the knowledge in industrial organization, accounting and finance necessary to administer sharing obligations. Along with lacking expertise, the courts do not have the same ability as agencies to

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beneficial from a cost perspective. Moreover, the price decreases necessary for the introduction of such competition to be beneficial would be large.").

[144] *See* Massa, *supra* note 115, at 40 ("Open access creates significant implementation and regulatory issues, but provides the most comprehensive remedy to permanently inject competition on every bottleneck segment on the national network. One or a combination of these reforms may be necessary to unravel the competitive problems that have developed as a result of the STB's and [Interstate Commerce Commission's] policy of granting virtually every merger application.").

[145] *See* Salvatore Massa, *Are All Railroad Mergers in the Public Interest? An Analysis of the Union Pacific Merger with Southern Pacific*, 24 TRANSP. L.J. 413, 441-42 (1996-1997) ("As the level of industry concentration increases, the risk of anticompetitive behavior increases. Moreover, while the STB and ICC approach has embraced mergers, it remains uncertain whether mergers have contributed a significant portion of the efficiency gains realized by the railroad industry since 1980. Continued increases in industry concentration may pave the way for anticompetitive abuses the invite more regulation, defeating the ultimate goals of the Staggers Act. When the Staggers Act sought to facilitate consolidations, the industry was financially unsound and forty Class I railroads dotted the U.S. railroad map.").

[146] Weiser, *supra* note 123, at 558.

gather the information necessary to compute reasonable access terms.[147] Even if courts can order sharing of facilities and then direct a regulatory body to set the terms of access, [148] this judicial intervention may override an agency's good faith policy of under-enforcement in response to, for example, technological changes that have eroded an asset's natural monopoly characteristics. Unlike regulatory solutions, judicial remedies generally lack the flexibility that is important in overseeing dynamic industries.[149] If agency under-enforcement arising from regulatory capture or the ideological biases of the sitting administration is the cause of systematic under-enforcement, antitrust intervention is not the appropriate solution. Congress should, instead, act to strengthen the mandate of the agencies over ordering access to facilitate entry and competition in adjacent markets.[150] Moreover, this call for judicial restraint should not be construed as encouraging courts to grant firms in partly regulated industries broad antitrust immunities. In the context of restructured industries, antitrust enforcement in newly deregulated segments may, in fact, be especially critical to ensure that consumers realize the benefits of competition.[151] In the

[147] Mark A. Lemley & Philip J. Weiser, *Should Property or Liability Rules Govern Information?*, 85 TEX. L. REV. 783, 821 (2007).

[148] *See, e.g.*, Joseph R. Coker, Note, *Saving* Otter Tail*: The Essential Facilities Doctrine and Electric Power Post-*Trinko, 33 FLA. ST. U. L. REV. 223, 257 (2005-2006) ("[W]e should not completely eschew judicial remedies, which have advantages over remedial action through regulatory agencies. These remedial advantages include a forum where discovery is broader, an adjudicative body with broad discretion in its remedial authority, and an adjudicator not amenable to political influences. Such remedial advantages are evidenced in cases involving regulated industries, like *Otter Tail* where the court was able "to award pro-competitive relief without undertaking the responsibilities of superintending the remedy itself,' instead leaving this administration of the remedy to the regulatory body. Though this Comment stops short of endorsing the rationale that a judicial forum offers benefits superior to an agency forum – at least in the electric power context, cases have shown that essential facilities plaintiffs strategically use the broad discovery provided in courts as contract negotiation leverage – retaining a Sherman Act claim under the rationale of *Otter Tail* offers a middle ground where the courts can step in and address anticompetitive harm that falls through the regulatory cracks.").

[149] Weiser, *supra* note 123, at 557.

[150] *See* Peter C. Carstensen, *The Transformation of Economic Regulation: Market Dynamics and Legal Lag Comments on Professor Bush's Mission Creep*, 2006 UTAH L. REV. 811, 813 (2006) (arguing that Congress has failed to grant regulatory bodies the necessary authority to undertake restructuring of traditional natural monopoly industries and that antitrust courts have "limited capacity to remedy the problems of exclusion and discriminatory intent").

[151] *See, e.g.*, Darren Bush, *Mission Creep: Antitrust Exemptions and Immunities as Applied to Deregulated Industries*, 2006 UTAH L. REV. 761, 797-98 (2006) (explaining how antitrust remedies such as treble damages may

narrow sphere of asset sharing, however, the incremental benefit of having antitrust courts as a backstop to regulatory bodies likely does not justify the administrative costs and the risk of institutional conflict and economic harm.

V. "INTANGIBLE" ESSENTIAL FACILITIES

While traditionally courts have most often deemed physical infrastructure like electric transmission lines and railroad bridges to be essential facilities, intangible assets can also possess essential facility characteristics. For example, gene patents and operating system interfaces can be essential facilities because they have no functional equivalents and are necessary inputs in multiple adjacent markets. Unlike tangible natural monopolies, which have been brought under the purview of specialized federal agencies, these intangible essential facilities do not operate under any regulatory scheme. Moreover, in markets involving these intangible essential facilities, innovation rather than price may often be the most important characteristic of products.[152] In these markets, preserving competition may thus be especially important.[153] Unlike with tangible natural monopolies, applying the doctrine to intangible essential facilities is likely to be administratively straightforward. Gene patents and operating system interfaces have frequently been licensed in market transactions. Courts would thus not have to compute a reasonable price

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be necessary to prevent a repeat of the market manipulation that was observed in California's deregulated wholesale electricity market in 2000-2001); Richard J. Pierce, *Completing the Process of Restructuring the Electricity Market*, 40 WAKE FOREST L. REV. 451, 480-81 (2005) (observing that inelastic demand for electricity makes wholesale power markets particularly vulnerable to unilateral and joint exercises of market power).

[152] *See* Robert Pitofsky, *Antitrust and Intellectual Property: Unresolved Issues at the Heart of the New Economy*, 16 BERK. TECH. L.J. 535, 540 (2001) ("In the New Economy, … , the success of competition is frequently based on qualitative rather than quantitative factors: the key is not so much who can produce the most widgets at the lowest cost, but rather who can be the first to design, protect with intellectual property rights, and bring to market a new and improved widget. Because market participants' incentives and opportunities to innovate are increasingly important in the intellectual property-intensive new economy, a rational competition policy will pay more heed to the effects of market structure, competitive conduct, and enforcement on innovation than it paid in industries where cost minimization was the most significant dimension of efficient competition.").

[153] Jonathan B. Baker, *Beyond Schumpeter vs. Arrow: How Antitrust Fosters Innovation*, 74 ANTITRUST L.J. 575, 583-88 (2007) (observing that competitive markets generally produce greater innovation).

of access from complex cost information but could instead look to prior transactions for an appropriate benchmark. Moreover, sharing these assets requires only a one-time judicial intervention; once access has been granted courts will not have to supervise the injunction because intellectual assets are non-rivalrous and cannot be "withheld" once disclosed.

A. Upstream Intellectual Property Rights and Network Effects: Potential Obstacles to Competition in Adjacent Markets

In the context of intangible assets, patents over basic research tools and network externalities combined with intellectual property protection can create essential facilities. These assets, in turn can be leveraged into adjacent markets to the detriment of consumers.

i. Upstream Intellectual Property Rights

The basic justification for intellectual property rights is not in serious dispute. Intangible goods like the design of a computer chip or software code are public goods characterized by high fixed costs and low marginal costs of production.[154] In an unregulated market for ideas, infinite "copies" would be priced at the marginal cost of production, which with today's technologies would be nominal for many intellectual assets. While such a marketplace would achieve allocative efficiency, it would not provide adequate incentives for developing the ideas in the first instance. Authors and inventors who expended significant time and expenditures upfront would not be able to recoup their fixed costs in a perfectly competitive market and would refrain from sinking resources in the creation of intangible goods.[155] To prevent this destructive free-riding, intellectual property laws grant the creators of technical inventions and the authors of

[154] POSNER, *supra* note 2, at 38, 42.
[155] *Id.* at 38.

creative works an exclusive right in the form of patents and copyrights, respectively, to market and license their ideas. These exclusive rights confer market power and impose the textbook efficiency losses on society.[156] The implicit premise of intellectual property rights is that the dynamic gains from greater creativity and innovation exceed the static efficiency losses arising from the legal creation of market power.

For a number of reasons, the scope and duration of intellectual property rights have been greatly expanded over the past thirty years. The copyright term has been extended another twenty years.[157] Computer programs, which previously could not receive copyright protection as a class, are now eligible for copyright and patent protection.[158] Isolated gene sequences, although derived from the naturally occurring human genome, are now patentable.[159] Intellectual property "monopolies," however, do not offend the antitrust laws. Intellectual property is recognized as being a necessary due to the public good nature of intangible products, and antitrust condemns conduct that improperly extends or maintains monopolies rather than monopoly power itself.[160] Furthermore, as the Supreme Court recognized recently with regard to patents,[161] many intellectual property assets have fungible equivalents. Although the intellectual property owner has an exclusive right over a particular technical invention or form of artistic expression, many other comparable items may compete in the relevant market.[162] The actual market power of

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[156] *Id.*
[157] JAMES BOYLE, PUBLIC DOMAIN: ENCLOSING THE COMMONS OF THE MIND 24 (2009).
[158] *Id.* at 171.
[159] *Id.* at 50.
[160] *See Trinko*, 540 U.S. at 407 ("It is settled law that [a Section 2] offense requires, in addition to the possession of monopoly power in the relevant market, 'the willful acquisition or maintenance of that power as distinguished from growth or development as a consequence of a superior product, business acumen, or historic accident.'") (quoting United States v. Grinnell, 384 U.S. 563, 570-71 (1966)).
[161] Illinois Tool Works, Inc. v. Independent Ink, Inc., 547 U.S. 28, 42-43 (2006).
[162] Rochelle Dreyfuss, *Unique Works/Unique Challenges at the Intellectual Property/Competition Law Interface*, 2005 EUR. COMPETITION. L. ANN. 199 (2005).

intellectual property owners is hence often not nearly as significant as initial appearances may suggest.

The exclusivity of intellectual property rights can raise antitrust concerns when a copyright or patent covers an item that has no functional equivalent and is used as an input in other markets. Some types of intellectual property are thus essential inputs in other markets and cannot be feasibly duplicated. While encouraging the production of these outputs, intellectual property rights, however, may have adverse effects on markets that rely on these assets as inputs. Under current law, copyright and patent owners have virtually complete discretion over who is allowed to license their intellectual property.[163] Because of this so-called property rule that governs most copyright and patent licensing decisions, the owners of these assets can choose to refrain entirely from licensing them. Intellectual property holders can thus foreclose rivals in connected markets and extend their monopoly power. The elimination or reduction of competition in these markets can lead to higher prices and reduced innovation.[164]

ii. Network Externalities and the Threat of Market "Tipping"

Network externalities in combination with intellectual property protection may also confer essential facility characteristics on an intangible asset. For most goods, the value to a consumer is principally a function of the good's price. For products that exhibit network

[163] Joseph P. Bauser, *Refusals to Deal with Competitors by Owners of Patents and Copyrights: Reflections on the* Image Technical *and* Xerox *Decisions*, 55 DEPAUL L. REV. 1211, 1212 (2005-2006).
[164] *Id.* at 1224-25 ("[T]here is substantial evidence that affording too much protection will actually lessen incentives for innovation. Furthermore, even if such an increase in protection would lead to enhanced innovation, the trade-off in harm to the public that would result from that greater measure of protection has been deemed unacceptable because it would inappropriately increase the degree to which unrestricted public access to those inventions or works would be foreclosed. Not only does a longer term have the obvious effect of extending the duration of the patent or copyright monopoly, but it also extends the period during which others may not make variations, 'improvements,' or other kinds of derivative works of the original work, thus *decreasing* innovation and product variety in adjacent areas.").

externalities, the value to a consumer is a function of both the good's price and the number of users of the good.[165] The paradigmatic but dated example of a product exhibiting network externalities is the fax machine.[166] An individual owning the world's only fax machine would not derive much value from it – after all, no faxes could be sent or received. The value a consumer derives from the fax machine is largely a function of how many others are using the fax machine.[167] A network of a million fax machines is more valuable than a network of a thousand fax machines. Each additional user of a network good thus incrementally increases the value of the network for all existing users. Because this incremental benefit accrues to every user instead of being captured solely by the new user, it qualifies as an externality. Due to the presence of positive externalities, economists theorize that the market under-produces network goods.[168]

While fax machines produce obvious network externalities, intangible goods like software and technological standards can also exhibit the same quality. Traditional network goods like fax machines exhibit direct network effects: Each new user enhances the value of the network to all existing users by creating a larger universe of potential recipients and senders.[169] The network externalities arising from software and technological standards operate indirectly. For example, an operating system increases in value as more applications are written for it. Programmers, however, do not want to write programs for operating systems with few users. As an operating system becomes more widely adopted, more applications are written for it.[170] New

[165] Michael L. Katz & Carl Shapiro, *Systems Competition and Network Effects*, 8 J. ECON. PERSP. 93, 96 (1994).
[166] *Id.*
[167] *Id.*
[168] *Id.*
[169] *Id.*
[170] *See id.* at 99 ("[I]f software is produced subject to declining marginal cost, due to traditional economies of scale or learning by doing, then a larger base of hardware owners will lead to greater software sales, a lower marginal cost of software, and a lower price. Similarly, the larger base may lead to a greater variety of software or software of higher quality.").

users thus provide an indirect benefit to existing users: By choosing a particular operating system, they encourage the creation of new applications software for that platform.[171] A wider variety of application software, in turn, attracts more users, unleashing a positive feedback loop for the owner of the successful operating system. Similar phenomena have been observed for technological standards like the video recording format "standards race." In the market contest between VHS and Betamax for control of the infant video recording industry, JVC, the owner of the VHS standard, liberally licensed its standard to manufacturers while Sony maintained exclusive control over the Beta standard.[172] These choices may have been decisive because the lower price of VHS machines allowed it to capture a larger market share. Because consumers preferred VHS recorders, movie studios began releasing their films in VHS, instead of Betamax, format.[173] The "virtuous circle" between consumers and movie studios meant that VHS parlayed its initial advantage into total dominance.

In some industries such as the market for videocassette recorders, network externalities may be so strong that the entire market "tips" to one standard or platform. "Tipping" occurs when one platform's initial advantage is magnified into near-complete dominance of the relevant market.[174] The process is the result of a self-fulfilling prophecy: Consumers expect that one product will ultimately prevail and adopt it on this basis alone. When the platform exhibits indirect network externalities, makers of complementary products recognize that rival platforms will have a small or non-existent user base in the feature and cease to make products compatible

[171] *Id.*
[172] Stanley M. Besen & Joseph Farrell, *Choosing How to Compete: Strategies and Tactics in Standardization*, 8 J. ECON. PERSP. 117, 126 (1994).
[173] *Id.*
[174] Katz & Shapiro, *supra* note 165, at 105-6 ("In markets with network effects, there is natural tendency toward de facto standardization, which means everyone using the same system. Because of the strong positive feedback elements, systems markets are especially prone to 'tipping,' which is the tendency of one system to pull away from its rivals in popularity once it has gained an initial edge.").

with them. At this point, users of the losing product have no choice but to switch to the winning product and incur the associated switching costs. Tipping is not inherently harmful; in some industries, having a single standard with a large installed base may be more desirable than having multiple standards. Market tipping may be the high technology equivalent of the traditional natural monopoly: A single operating system or video recording format may be the most efficient market outcome.[175] Moreover, network externalities do not inevitably lead to market tipping. Heterogeneous consumer tastes can often mitigate the threat of market tipping.[176] The small but nontrivial market share of Apple's operating system in the personal computer market demonstrates how the desire for variety can contain, at least partly, the threat of complete tipping.[177]

Although tipping is not necessarily undesirable, it can lead to three specific harms – one of which is an antitrust concern and two of which are likely not. First, tipping can lead to the adoption of an inferior technological product or standard.[178] The adoption of the QWERTY keyboard may be one of the more impressive examples of how a qualitatively inferior standard may become an industry norm. An early manufacturer of the typewriter adopted some elements of the admittedly odd but now ubiquitous keyboard arrangement in response to the problem of

[175] Mark A. Lemley & David McGowan, *Could Java Change Everything? The Competitive Propriety of a Propriety Standards*, 43 ANTITRUST BULL. 715, 722-23 (1998).
[176] Katz & Shapiro, *supra* note 165, at 106.
[177] Gregg Keiser, *Windows Market Share Dives Again as Mac Near 10%*, COMPUTERWORLD, Jan. 2 2009, available at http://www.computerworld.com/s/article/9124718/Windows_market_share_dives_again_as_Mac_nears_10_?intsrc=hm_list.
[178] *See* Katz & Shapiro, supra note 165, at 106 ("[S]tandardizing on a single system can be very costly if the system selected turns out to be inferior to another system. With network effects, it can be very difficult to switch horses in midstream to a system that later proves superior. For example, the Japanese HDTV system is now widely regarded as inferior to the system being developed for use in the United States; NHK and other Japanese suppliers did not expect a workable all-digital system to be feasible before the turn of the century, so they focused their efforts on an analog system. Because the Japanese were promoting a single standardized system, they were not well placed to offer a digital system when such systems were recognized as feasible.").

jamming among early typewriters.[179] The final QWERTY layout came into being as part of a marketing gimmick.[180] Although hardly the only keyboard layout in the early years of the typewriter, QWERTY typewriters were the most popular in the early years and so typists acquired mastery over these machines.[181] Once a critical mass of QWERTY typewriters (the hardware) and QWERTY-trained typists (the "software") existed, the market standard quickly became QWERTY.[182] This layout was adopted even though QWERTY, once typeset jamming had been addressed, is inferior to other keyboard layouts in terms of typing speed.[183] While adoption of subpar standards is of concern to policymakers, antitrust almost certainly cannot do anything to ensure that the superior product triumphs in every instance. Second, consumers and producers may make costly mistakes during the standards war.[184] Consumers and producers often do not know ex ante if a particular standard will achieve near-dominance. As a result, they must make an informed decision as to how other consumers and producers will behave. If a consumer chooses the losing standard, he or she may have to incur significant switching costs and adopt the prevailing standard. Likewise, a firm may sink substantial resources in producing complementary products for the losing standard. An illustrative example is an early buyer of a Betamax video recorder. Once the VHS triumphed, he or she would have to purchase a VHS and new video cassettes or remain forever contented with his or her present library of films. Like the possibility of an inferior technology prevailing in the adoption race, mistaken consumer and producer investments do not have a clear antitrust remedy. Third, the owner of the product that

[179] Paul A. David, *Clio and the Economics of QWERTY*, 75 AM. ECON. REV. 332, 333 (1985).
[180] *See id.* ("[M]any modifications included some fine-tuning of the keyboard design in the course of which the 'R' wound up in the place previously allotted to the period mark '.' Thus were assembled into one row all the letters which a salesman would need to impress customers, by rapidly pecking out the brand name: TYPE WRITER.").
[181] *Id.* at 334-35.
[182] *Id.* at 335.
[183] *See id.* at 332 ("Devotees of the keyboard arrangement patented in 1932 by August Dvorak and W.L. Dealey have long held most of the world's records for speed typing.").
[184] Besen & Farrell, *supra* note 172, at 118.

has achieved complete dominance through tipping may be able to leverage its monopoly power into complementary markets that would otherwise be competitive.[185] Once dominance has been achieved, the owner of the prevailing platform may have an incentive to leverage its monopoly power, to either enhance profits in linked markets or protect profits from its core monopoly.[186]

B. Examples of Intangible Essential Facilities

i. Patented Genetic Sequences

The patenting of human genes may be the most dramatic and controversial expansion of intellectual property rights in recent decades. The Court of Appeals for the Federal Circuit has relaxed a number of traditional doctrinal limits to permit the patenting of isolated DNA sequences.[187] A recent district court ruling dramatically halted this trend, at least temporarily. In his unexpected decision, Judge Robert Sweet of the Southern District of New York ruled that patents on the breast cancer susceptibility genes, BRCA1 and BRCA2, are unconstitutional.[188] While the ruling came as a surprise to many in the legal and biotech communities, the court's

[185] Mark A. Lemley & David McGowan, *Legal Implications of Network Effects*, 86 CAL. L. REV. 479, 496 (1998).
[186] *See* Richard J. Gilbert & Michael L. Katz, *An Economist's Guide to U.S. v. Microsoft*, 15 J. ECON. PERSP. 25, 37 (2001) ("[B]y tipping the market in favor of Internet Explorer, Microsoft's conduct undermined the ability of Netscape Navigator to attract software developers to write applications that will run in the Netscape/Java environment. According to Ad-Knowledge, Inc., Internet Explorer's share of monthly browser usage increased from 20 percent in January 1997 to more than 50 percent by August 1998, and other data suggest it has increased since 1998. Judge Jackson concluded that Microsoft's anticompetitive conduct contributed to Netscape's decision not to do the engineering work necessary to continue bundling up-to-date 'Java Virtual Machines' – the programs that interpret Java for a particular operating system – that would be compliant with Sun's standards in future versions of Navigator.").
[187] Rebecca S. Eisenberg, *How Can You Patent Genes?*, 2 AM. J. OF BIOETHICS 3, Summer 2002, at 4.
[188] Assoc. for Molecular Pathology v. US Patent and Trademark Office, 2010 *U.S. Dist. LEXIS* 35418, *2-3 (S.D.N.Y. 2010).

ruling is almost certainly not the last word on the BRCA1 and BRCA2 patents, let alone the patentability of isolated genes in general.[189]

From an economic perspective, gene patents arguably provide the incentive to undertake the investments for sequencing and isolating genes.[190] Isolating genetic sequences can be a costly and uncertain process; without a patent over the gene itself, the possibility of free-riding may weaken the incentive to produce genetic sequences in purified form and identify their functional purposes.[191] In the United States, the presence of gene patents may have been decisive in the rise of the biotechnology industry. Without their portfolio of gene patents, the small companies that have been at the cutting-edge of basic biotechnological research may not have been able to attract venture capital funding.[192] Gene patents, as all patents do to varying degrees, impose costs

[189] *Reining in Patents*, LA TIMES, Mar. 30, 2010, available at http://articles.latimes.com/2010/mar/30/opinion/la-ed-genes31-2010mar31.

[190] *See* Arti K. Rai & Rebecca S. Eisenberg, *Bayh-Dole Reform and the Progress of Biomedicine*, 66 LAW & CONTEMP. PROBS. 289, 299 (2003) ("While it is possible that biopharmaceutical firms, particularly those that produce end products, would benefit in the long term from restrictions on the upstream patents that feed into drug development, many of these firms continue to insist that they need patents on their research to attract risk capital for further development. Changes in the patent laws that exclude research tools from protection or exempt research activities from infringement liability could have a significant effect on the ability of these firms to raise funds for research. Given that overall private investment in biomedical R&D today exceeds public funding, the strong belief of private sector investors are essential to their profit expectations urges caution in changing the underlying legal rules that support these investments.").

[191] *See* Rebecca S. Eisenberg, *Patenting the Human Genome*, 39 EMORY L.J. 721, 736 (1990) ("A rule that limits the first inventor to process patent protection may consequently provide a considerably weaker incentive to invest in developing the first means of making an obviously desirable product than a rule that offers product patent protection. Whether the process patent alone would provide an adequate incentive to induce the necessary inventive effort is ultimately an empirical question with an answer that varies from one invention to the next. Yet the first inventor to develop a means of making an obviously desirable but previously unobtainable product has made an invention that the public may well consider worth the price of a patent monopoly on the product itself. Rather than risk losing valuable inventions by offering too little patent protection in the form of what may eventually become an unenforceable process patent, it may be preferable to offer the higher bounty of a product patent at the outset.").

[192] *See* John M. Golden, *Biotechnology, Technology Policy, and Patentability: Natural Products and Invention in the American System*, 50 EMORY L.J. 101, 139 (2001) ("[T]he biotechnology industry does engage in substantial basic research, and, to the extent that it does, it funding is most likely to come from venture capital. Indeed, most biotechnology firms start out as venture-capital-financed 'spin-outs' from a university of research institute, beginning their existence as research and development companies that leverage relatively narrow technical expertise, as well as intellectual property, for both financing and limited amounts of revenue.").

on society. They, however, may be necessary to stimulate critical research in an important and growing field within the life sciences.

While patents may provide the necessary encouragement for researchers and firms to isolate genes, the exclusivity they grant over important genetic sequences can retard innovation in downstream markets. With the growing importance of molecular biology in understanding human pathologies, genes are necessary inputs in countless lines of biotechnological and pharmaceutical research.[193] The ever-changing nature of the field suggests that only a small subset of all potential applications is even known today. As a theoretical matter, a researcher or firm owning a patent over a gene has an incentive to use the gene for research purposes or license it to others capable of carrying out research.[194] The owner of the patent may, however, have also economic reasons for refusing to license the patent to downstream users. For instance, the patent owner may want to leverage its monopoly product markets that rely on the gene as a critical input and maintain control over commercial research efforts.[195] History also suggests that patents broad in scope have often not been licensed effectively due to transaction costs and patentee inertia.[196] This failure to optimally license patents has been observed in the biopharmaceutical industry.[197] The adverse effects on innovations in lifesaving technologies may be severe. The benefits of parallel research and development efforts may be especially

[193] Brian A. Jackson, *Innovation and Intellectual Property: The Case of Genomic Patenting*, 22 J. POL'Y ANALYSIS & MGMT. 5, 11 (2003).
[194] Edmund W. Kitch, *The Nature and Function of the Patent System*, 20 J. L. & ECON. 265, 276 (1977).
[195] Jackson, *supra* note 193, at 12.
[196] Robert P. Merges & Richard P. Nelson, *On the Complex Economics of Patent Scope*, 90 COLUM. L. REV. 839, 886-87 (1990).
[197] Arti K. Rai, *Fostering Cumulative Innovation in the Biopharmaceutical Industry: The Role of Patents and Antitrust*, 16 BERK. TECH. L.J. 813, 831-32 (2001).

pronounced in biotechnology and pharmaceuticals.[198] Given the nature of progress in the field, the possibility of leveraging gene patents into downstream markets could delay or even foreclose the development of breakthrough drugs and therapies.[199]

Applying the essential facilities doctrine to gene patents mediates the tension between providing the necessary incentives for genetic research and avoiding the dangers associated with exclusive patent rights. Patents over the genes responsible for ailments like breast cancer and asthma may represent the "quintessential essential facility."[200] They cannot be duplicated and lack any functional substitute.[201] Firms working on an advanced diagnostic method for colon cancer may not be able to proceed with their research without access to the relevant complement of genes. The essential facilities doctrine can be used to compel the owners of gene patents to license their patents to downstream entities at a court-determined royalty. By applying the essential facilities doctrine, courts would not be questioning the basic premise for granting patent rights over gene sequences. Owners of gene patents would still receive compensation for the use of their intellectual property but would not be able to withhold licenses from all comers.

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[198] *See id.* at 832 ("On first examination, the inability to conclude licenses on low-value research might not appear disturbing. However, as NIH Working Group Chair Rebecca Eisenberg has pointed out, because parties often fail to predict accurately which research will ultimately be valuable, there is reason to be concerned when even ostensibly low-value transactions do not go forward."); Tim Wu, *Intellectual Property, Innovation, and Decentralized Decisions*, 92 VA. L. REV. 123, 130-31 (2006) ("In a period of great change or uncertainty, the most fruitful line of inquiry may be difficult to ascertain, making the ability of [multiple research paths] to turn up innovative ideas particularly useful.").

[199] *See* Rai, *supra* note 197, at 835 ("[V]ertical integration considerably narrows the number of different research avenues that are likely to be pursued. Not only is a single vertically integrated firm likely to be relatively large, and hence possibly risk averse and lacking in creativity, but it is also unlikely to license its upstream research to other developers who may pursue alternate research paths. Such licensing would create the very transaction costs that integration was intended to eliminate. It would also be likely to yield competing end products.").

[200] *See* Amy Rachel Davis, Note, *Patented Embryonic Stem Cells: The Quintessential "Essential Facility"?*, 94 GEO. L.J. 205 (2005-2006) (arguing that essential facilities doctrine should be used to compel sharing of embryonic stem cells).

[201] *See* Jackson, supra note 193, at 18 ("When confronted by a high licensing fee demand, a firm seeking to use a gene in a subsequent invention will have to decide whether to give up the research activity, to attack the underlying patent, or to accede. Depending on the particular genes and diseases involved, these may be the only choices since there may be no substitutes or routes to invent around the patent.").

ii. Microsoft Windows' Application Programming Interfaces

Microsoft Windows is a platform that became dominant due to network externalities. Like video recording formats and other virtual networks, operating systems produce indirect network externalities. An operating system is useful only in conjunction with application programs and thus becomes more valuable as its library of application program grows.[202] Application programs are written specifically for operating systems and cannot easily be transferred across platforms.[203] Because they want the largest potential market, software developers write programs for operating systems with larger user bases.[204] Likewise, users purchase computers with operating systems that have the largest complement of application programs.[205] This "chicken-and-egg" problem makes entry for new operating systems particularly difficulty.[206] A new platform maker must persuade users and application developers that the other group will be writing programs for and using the operating system, respectively. Because of Microsoft's perceived market share advantage in the initial contest between operating systems for IBM-compatible machines, the operating systems' market tipped almost entirely to Windows.[207] Application software makers, presumably recognizing Windows initial advantage in installed base, focused their development efforts on producing Windows-compatible software. After Windows achieved a certain market share and spawned a large array of application

[202] Steven C. Salop & R. Craig Romaine, *Preserving Monopoly: Economic Analysis, Legal Standards, and Microsoft*, 7 GEO. MASON L. REV. 617, 621 (1998-1999).
[203] *Id.* at 630-631.
[204] Gilbert & Katz, *supra* note 186, at 28.
[205] *Id.*
[206] *Id.*
[207] *See* Willow A. Sheremata, *Barriers to Innovation: A Monopoly, Network Externalities, and the Speed of Innovation*, 42 ANTITRUST BULL. 937, 939 (1997) ("The tippy aspect of network markets means that winners do not earn just slightly higher profits. Instead, even small differences in buyer perception lead to winner takes all. The winner's position then becomes highly entrenched. This invites fierce competition prior to tipping for an architectural franchise and corresponding monopoly profits. Microsoft's dominance in the x86 operating system market led to an architectural franchise, as did IBM's dominance in several mainframe markets. Firms with architectural franchises can extract large profits from buyers who cannot obtain network benefits elsewhere.").

software, consumers recognized the superiority of the platform and purchased Windows-based personal computers.[208] The process, in essence, was the result of a self-fulfilling prophecy on the part of users and software developers. Of course, rival operating systems do exist and even continue to flourish but they are secondary players, at best.[209] Even if functionally superior as stand-alone software, however, these operating systems have little hope of challenging Windows' dominance because they likely cannot persuade both users and application developers to migrate simultaneously.[210]

Because Windows may be a quasi-natural monopoly because of the strength of network externalities,[211] Microsoft has the ability – thought not always the incentive – to leverage its operating system monopoly into the markets for application software. As the government's landmark antitrust case against it suggests, Microsoft has myriad means to leverage its dominance.[212] One method involves denying unaffiliated software developers access to Windows' application programming interfaces (APIs). These pieces of code allow applications to run on the Windows platform and use the operating system's built-in functionality to perform certain basic routines.[213] Without access to APIs, it is nearly impossible to write fully compatible

[208] *See* Salop & Romaine, *supra* note 202, at 621 ("[T]he application software developer has the incentive to write its program for the operating system that has the largest installed base of users. Of course, users value an operating system for the number and quality of applications that run on it. This process can create a positive feedback loop, a bandwagon effect. If more users buy an operating system, that wider usage will induce more application to be written for that operating system, which will induce more users to buy the operating system and so on.").
[209] Keiser, *supra* note 177.
[210] *See* Sheremata, *supra* note 207, at 954 ("The markets in [industries producing strong network externalities] can easily be manipulated by a company with a large installed base, with the result that superior products of competitors are not likely to prevail in the free market. Indeed, in increasing returns industries, there is every reason to believe that consumers will get locked into the first product that appears on a new platform, even when the product is technologically inferior.").
[211] *Id.* at 959.
[212] Salop & Romaine, *supra* note 202, at 630-45 (describing the contractual and technological means through which Microsoft sought to exclude incipient threats to its operating system monopoly).
[213] *Id.* at 620-21.

software for Windows.[214] Generally, granting API access to application developers is a rational strategy: Applications and operating systems are complementary products and so a drop in the price of one stimulates demand for the other. In the software context, a larger selection of applications software increases the value of the Windows platform to users.

While Windows is a partially open system at present, Microsoft has in the past and could again in the future restrict access to its APIs if, for example, it feared that a particular application threatened its operating system monopoly.[215] In the 1990s, Microsoft feared Netscape and Sun Microsystems precisely because they threatened to undermine Windows' monopoly in the operating systems' market. The two firms, by writing applications with their own APIs, sought to erode the network externalities associated with Windows and thus reduce the barriers to entry in the market for operating systems.[216] If Netscape and Java obtained a sufficiently large user base, software developers could write Netscape- and Java-compatible software instead of Windows-compatible software. If successful, Netscape and Sun threatened to make the underlying

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[214] *Id.*

[215] *See* Philip J. Weiser, *The Internet, Innovation, and Intellectual Property Policy*, 103 COLUM. L. REV. 534, 579 (2003) ("In the computer world, the proprietary model relies on the ability of software firms to maintain close control over the [APIs] for the programs they develop. … In the context of proprietary software, control over these interfaces enables the platform owner to maintain control over its platform both defensively – to prevent rivals from cloning its products – as well as offensively – to prevent rivals from creating compatible products. In the government's antitrust case against Microsoft, for example, the government submitted evidence of a manager's statement that 'to control the APIs is to control the industry' and established that Microsoft's monopoly rested, in part, on its firm control of its APIs.").

[216] *See* Salop & Romaine, *supra* note 202, at 631 ("Entry and expansion barriers might be reduced if operating systems were compatible, that is, if a program written for one operating system would also run on another operating system without having to make any changes to the program. In that case, the costs of porting are zero. For that matter, barriers would be reduced any time it becomes less expensive to port application programs from one operating system to another. This creates a potential role for products that facilitate cross-platform compatibility at low cost. Increasing interoperability by creating cross-platform compatibility is a potential benefit of Netscape and Java. Left unencumbered, both Netscape and Sun's Java programming environment might have the potential to fundamentally change the economics of the operating system market, particularly in tandem. Instead of writing their programs to the Windows operating system APIs, application programmers could write to a new standard – the APIs of the browser or the Java APIs. If all operating systems were compatible with this standard, then application programs would run on all operating systems. Porting costs would be eliminated. Programs would become interoperable.").

operating system irrelevant: their application and programming language, respectively, would act as intermediaries between application software and the operating system. Users would have the ability to install non-Windows platforms on their computers without sacrificing functionality; their applications could be "ported" across different operating systems using Java and Netscape.

If Netscape and Sun successfully "commodified" the operating system market, the barriers to entry protecting Microsoft's dominance would disappear. To address this nascent threat, Microsoft used a combination of contractual and technological ties and retaliatory conduct against hardware manufacturers and Internet service providers to contain the competitive threat from Netscape and Sun.[217] If Microsoft faced a similar competitive situation in the future, it could alternatively withhold its APIs from rivals.[218] Unable to use Windows' APIs to perform basic functions, the applications of rival firms would run poorly on Windows computers, if at all.[219] By depriving rival firms of the ability to write Windows-compatible software, Microsoft could ensure that these new entrants would fail in their attempts to grow their user base and challenge Windows' dominance. In other words, Microsoft would prevent these new entrants from enjoying the network externalities that protects its own operating system.

Along with protecting its operating system monopoly, Microsoft could want to promote the success of its own application programs and so seek to stifle new entrants in this market. For instance, Microsoft may want to protect or increase the market share of Microsoft Word. Aside from competing on the merits, Microsoft could handicap the makers of rival word processors by denying them access to key APIs and try to reduce the openness of the applications software

[217] *See id.* at 636-42 (analyzing tactics Microsoft used to exclude Java and Netscape).
[218] *Id.* at 635.
[219] *Id.*

market. In a similar vein, Apple followed such a strategy in the 1980s and refused to license its architecture to other hardware and software makers. [220] In spite of industry observers' belief that Apple's products were functionally superior, the company's decision to maintain a "closed system" arguably may have prevented it from becoming the dominant personal computer platform.[221] In competitive markets, antitrust does not and should not seek to remedy poor business decisions like Apple's decision to prematurely close its system. In an environment with multiple rival systems, the pressures of the marketplace strongly discourage and punish irrational business strategies such as premature creation of a proprietary system. In a monopolistic market with high barriers to entry, however, frustrating the entry of new firms, whether for rational or irrational reasons, can impose significant harm on consumers[222] and retard future innovation.[223] Without the disciplining force of competition, antitrust intervention may be justified to maintain open systems.

As with gene patents, the essential facilities doctrine can be used to compel the sharing of APIs with independent software makers. Application of the doctrine, by allowing access to the APIs, can promote competition in both the operating system and application software markets. Although Microsoft Windows may appear to be a uniquely dominant platform, its history may be reflective of a more general phenomenon in high-technology industries. Due to network

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[220] Joseph Farrell & Philip J. Weiser, Modularity, *Vertical Integration, and Open Access Policies: Towards a Convergence of Antitrust and Regulation in the Internet Age*, 17 HARV. J.L. & TECH. 85, 115-16 (2003-2004).
[221] *Id.*
[222] *See* Weiser, *supra* note 215, at 581 ("[A]lthough monopolies such as IBM and Microsoft may be dethroned at some point, the exercise of monopoly power in the meantime – which may well be several decades – still can injure consumers.").
[223] *See id.* at 581-82 ("[N]umerous studies have shown that incumbent monopolies often fail to develop and deeply radically new technologies, sometimes even using their current monopolies to distort and thwart the process of competing to introduce more innovative products. Indeed, this very concern motivated AT&T's decision not to embrace the Internet at its creation as well as to slow roll the deployment of wireless telephone service. Thus, an important role for regulation is to keep entry open so that challengers with new ideas can force the pace of innovation.").

externalities, other standards may tip to monopoly and then be leveraged into related markets to reduce actual and potential competition.[224]

C. Courts Would Not "Assume the Day-to-Day Controls Characteristic of a Regulatory Agency"

The proposed reorientation of the essential facilities doctrine seems to rest on a fundamental contradiction: It assumes that courts cannot set terms of access correctly for tangible essential facilities but can set appropriate royalties for intangible essential facilities. This premise seems dubious at first glance and suggests that the forced sharing of intellectual assets would likely have an adverse effect on incentives. Yet, an important distinction must be drawn between tangible and intangible assets. The former were rarely, if ever, available in the marketplace until open access regimes were imposed. If the courts were to direct a utility to share a particular transmission facility with independent electric generators today, they would have to compute the price of access on its own – a difficult task for generalist judges and clerks – or commandeer the resources of a potentially antagonistic regulatory body. In contrast, intangible assets like gene patents and operating system APIs have frequently been shared through market transactions.[225] Courts could look to a prior course of dealing to find a market price for the same or similar asset, which presumably includes a reasonable return on investment, and set terms of access based on that. This is an important distinction and even the *Trinko* Court, hardly a

[224] *See, e.g.*, In the Matter of Intel Corp., 2009 FTC LEXIS 227, at 33 (Dec. 16, 2009) (alleging that Intel deprived firms of access to interface between central processing unit and chipset to reduce competition in market for graphical processing units).

[225] *See, e.g.*, Michael S. Mireles, *An Examination of Patents, Licensing, Research tools, and the Tragedy of the Anticommons in Biotechnology Innovation*, 38 U. MICH. J.L. REFORM 141, 163-65 (2004-2005) (discussing licensing of research tools and use of reach-through royalty provisions, which allow licensor to capture percentage of sales from commercial application of a research tool and remedy uncertain *ex ante* value of tool); Pamela Samuelson, *Are Patents on Interfaces Impeding Interoperability?*, 93 MINN. L. REV. 1943, 1952 ("[Microsoft] publishes many of its APIs and licenses others.").

proponent of imposing antitrust duties to deal, conceded that the existence of market prices for an asset would simplify the administrative challenge of court-ordered asset sharing.[226] The change in background rule – the threat of compulsory licensing – may alone be enough to change economic behavior: The possibility of compulsory licensing may encourage the voluntary signing of licensing agreements as a matter of course.[227]

Because courts are likely to set reasonable royalties, the imposition of the essential facilities doctrine on a small category of intellectual assets is not especially radical notwithstanding appearances. From a theoretical perspective, it substitutes, for a narrow category of intellectual property owners, a liability rule for the existing property rule that presently exists over their assets.[228] Parties seeking access would be paying a fair price for obtaining the right to use the intangible asset and so would not be free riding on the original investment. Because all intellectual property regimes sacrifice, to some degree, access to create stronger incentives, some scholars have even argued that a more widespread application of liability rules over intellectual property may better mediate this contradiction and yield better

[226] *Trinko*, 540 U.S. at 409-10 ("The specific nature of what the [Telecommunications Act of 1996] compels makes this case different from Aspen Skiing in a more fundamental way. In Aspen Skiing, what the defendant refused to provide its competitor was a product that it already sold at retail – to oversimplify slightly, lift tickets representing a bundle of services to skiers. Similarly in [Otter Tail], … , the defendant was already in the business of providing a service to certain customers (power transmission over its network), and refused to provide the same service to certain other customers. In the present case, by contrast, the services withheld are not otherwise marketed or available to the public. The sharing obligation imposed by the 1996 Act created something brand new – the wholesale market for leasing network elements.").

[227] *See* Dreyfuss, supra note 162, at 136 ("[T]he availability of a competition law remedy should have much of the same in terrorem effect as the compulsory licensing statutes found in many national laws – the mere fact that a court could intervene may be enough to bring a recalcitrant licensor to the bargaining table, where it can structure its own licensing terms with its partners."); Jeffrey J. Rachlinski & Forest Jourden, *Remedies and the Psychology of Ownership*, 51 VAND. L. REV. 1541, 1574-75 (1998) (arguing based on behavioralist experimental studies that liability rules may be more conducive to facilitating trade than property rules).

[228] Guido Calabresi & A. Douglas Melamed, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral*, 85 HARV. L. REV. 1089, 1092 (1971-1972).

social outcomes.[229] Moreover, in the case of de facto monopoly platforms like Microsoft Windows, the incentives argument does not seem particularly strong because of the sizeable profits the platform owner has reaped from its market dominance.[230]

Even if royalties were set correctly, critics may contend that courts would be forced to monitor the subsequent conduct of the owner of the essential facility to ensure its compliance with the injunction. The *Trinko* decision warned, with some good reason, that courts are not institutionally equipped to perform the administrative duties of follow up monitoring and compliance.[231] In *Trinko*, the Telecommunications Act of 1996 had set up a complex system of monitoring to ensure compliance with sharing requirements.[232] The threat of a repeat violation was very real because Verizon had failed to fulfill its original sharing duties.[233] A court would have had a difficult time setting up monitoring and compliance scheme as comprehensive as what the FCC and New York Public Service Commission had established.

This concern ignores an important quality of intangible assets – they are not scarce once created. In the case of intangible essential facilities, a situation like the one between Verizon and new entrants in *Trinko* is unlikely to ever arise. The non-rivalrous nature of ideas makes the court-ordered sharing of intangible essential facilities logistically simpler than the sharing of tangible essential facilities. Thomas Jefferson provided perhaps the most eloquent explanation of how ideas differ from tangible goods:

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[229] *See, e.g.*, Jerome H. Reichman, *Legal Hybrids between the Patent and Copyright Paradigms*, 94 COLUM. L. REV. 2432 (1994); Lemley & Weiser, *supra* note 147, 793-95.
[230] *See* Weiser, *supra* note 215, at 591-92 ("Arguments that the forced sharing of a dominant industry standard would unduly undermine investment incentives deserve, … , a reality check. After all, a talented kid can be quite motivated by rents in the low tens of millions, trifling as those may seem.") (citations removed).
[231] *See Trinko*, 540 U.S. at 408 ("Enforced sharing … requires antitrust courts to act as central planners, identifying the proper price, quantity, and other terms of dealing, a role for which they are illsuited [sic].").
[232] *Id.* at 401.
[233] *Id.*

> If nature has made any one thing less susceptible than all others of exclusive property, it is the action of the thinking power called an idea, which an individual may exclusively possess as long as he keeps it to himself; but the moment it is divulged, it forces itself into the possession of every one, and the receiver cannot dispossess himself of it. Its peculiar character, too, is that no one possesses the less, because every other possesses the whole of it. He who receives an idea from me, receives instruction himself without lessening mine; as he who lights his taper at mine, receives light without darkening me.[234]

Once a court set the terms of access to the intangible asset, it would not have any subsequent compliance responsibilities. The non-rivalrous nature of the good ensures that, unlike Verizon which could physically deny rivals of access to its lines, the owner of a patented gene fragment or API cannot rescind the right to use the idea after it has been disclosed to the requesting entity. This is not to suggest that the judicial proceeding itself would not require a careful factual inquiry, particularly in the context of dominant interfaces.[235] Because the sharing of intangible assets requires a one-time remedy rather than on-going judicial supervision, however, courts would not have to "assume the day-to-day controls characteristic of a regulatory agency"[236] and may, from a societal perspective, be superior to agencies in regulating access to intangible essential facilities.[237] Rather than imposing a difficult institutional mission on the courts, the proposed reorientation of the essential facilities doctrine represents a pragmatic "division of labor." Specialized industry regulators would oversee open access regimes governing rivalrous, non-traded tangible natural monopoly assets while generalist courts would ensure access to non-rivalrous, marketed intangible essential facilities.

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[234] Letter from Thomas Jefferson to Isaac McPherson, (Aug. 13, 1813), *available at*, http://www.temple.edu/lawschool/dpost/mcphersonletter.html.

[235] *See* Samuelson, *supra* note 225, at 1998 ("[Forced disclosure of interface information] requires close oversight as to exactly which [intellectual property rights] must be licensed, how much detailed information must be transferred, how timely updated information must be provided, and how long the duty to license [intellectual property rights] or supply information will need to last.").

[236] Areeda, *supra* note 7, at 853.

[237] *See* Posner, *supra* note 2, at 390 ("[T]he common law is an imperfect regulatory system; but so is direct regulation. It tends to be costlier than common law regulation because it is continuous; the common law machinery is invoked only if someone actually is hurt.").

VI. THE DOCTRINE IS THE APPROPRIATE VEHICLE FOR ADDRESSING ANTICOMPETITIVE LEVERAGING THROUGH FORECLOSURE

The application of liability rules to intellectual property assets is not a novel proposal. Many scholars have advocated the creation of compulsory licensing schemes or the application of liability rules under the intellectual property laws to mitigate the threat of copyright and patent holdouts.[238] The essential facilities doctrine is, however, functionally superior to alternative judicial and legislative solutions under the intellectual property laws.

In establishing a compulsory licensing scheme over essential intangible essential facilities, Congress cannot realistically know ex ante which copyrights and patents are going to be essential and so may enact over-inclusive reforms.[239] For the vast majority of copyrights and patents, the prevailing property regime is not problematic because the presence of substitutes mitigates the threat of costly holdup problems. Creating a compulsory licensing system over most intellectual property would be a waste of scarce administrative resources. In many cases, a costly administrative system would be intruding on a system of successful private ordering. In other instances, copyrights and patents that were not essential at the time a compulsory licensing scheme was established may acquire essential facility status as markets evolve and new products are developed. A legislative fix would likely apply liability rules to both too few and too many assets. The courts, in fashioning antitrust rules from an ex post perspective, can apply liability

[238] *See, e.g.*, Reichman, *supra* note 229; Lemley & Weiser, *supra* note 147; Bell & Parchomovsky, *supra* note 4.
[239] *See* Dreyfuss, *supra* note 162, at 120 ("[I]tellectual property law lacks the capacity to deal with these problems effectively. While the power associated with rights over unique works could be diminished by enhancing the criteria for receiving protection in the first instance or by redefining the reach of protection, these approaches would reduce incentives to innovate across the board.").

rules in response to actual problems arising in the marketplace instead of having to anticipate future economic developments.[240]

Given the obvious limitations of a legislative solution, the courts could use liability rules to resolve infringement claims involving intangible essential facilities. An infringement suit is almost certain to arise if a party seeking to use an intangible essential facility to create a derivative product bypasses licensing negotiations with the owner and appropriate the asset without permission. In filing its infringement claim against the unauthorized user, the owner of the intangible essential facility is likely to seek both damages and an injunction. Because equitable relief is discretionary in nature, courts are not bound to grant an injunction to a successful plaintiff. The Supreme Court has held that the district courts should treat injunctive relief as discretionary in the intellectual property arena, as well.[241] Following the Court's directive, the district courts could, in the context of intangible essential facilities, award damages or set a fair royalty and deny injunctive relief. This argument in favor of a damages-only remedy, however, presupposes that prospective users can access and actually "infringe" the intangible essential facility in the first place. In many cases, technological measures or the use of trade secrecy may prevent the prospective user from even using the intangible essential facility in the first instance.[242] This is especially likely to be true with respect to the technical interfaces on

[240] *See id.* ("[C]ompetition law applies ex post. It has the analytical tools to assess the effect of specific practices on consumer welfare and can be read to require those who allege improper use of the power conferred by intellectual property to demonstrate competitive harm. As a result, competition law is arguably better suited than intellectual property law to curb excesses effectuated with these rights.").
[241] eBay, Inc. v. MercExchange, L.L.C., 547 U.S. 388 (2006).
[242] *See* Samuelson , *supra* note 225, at 1961 ("Trade secrecy is a much cheaper and easier means of getting IP protection for an interface than seeking a patent; it also obviates the need for disclosure of any innovation the interfaces embodies. Trade secrecy can, of course, be jeopardized by reverse engineering conduct by those who want to access interface information, but firms can and often do try to counteract this risk by inserting antireverse engineering clauses into their license agreements, or by obfuscating the design to make interfaces more difficult to discern. The more complex a program is, moreover, the more difficult it will be to access interfaces through reverse engineering.").

dominant technological interfaces. In such circumstances, the prospect of a liability rule alone is not sufficient to prevent intangible essential facilities from being used to foreclose competition in adjacent markets.

In contrast to the intellectual property law solutions, the Sherman Act grants parties denied access to an essential facility with an affirmative cause of action. Further, all private parties injured by anticompetitive behavior are entitled to treble damages.[243] The risk of antitrust liability may spur otherwise reluctant owners of intangible essential facilities to engage in good faith negotiations with prospective licensees.[244] The credible threat of an antitrust remedy may be sufficient to stimulate private licensing arrangements. While treble damages have been criticized because they may deter procompetitive conduct,[245] they are arguably a good approximation of the harm to society from exclusionary behavior. Because of problems of proof, consumers forced to forgo consumption of a product due to the higher prices resulting from anticompetitive conduct cannot collect antitrust damages.[246] Instead, damages are restricted to the amount of overcharge paid by actual customers.[247] In economic terms, antitrust damages account for the wealth transfers but not for the allocative inefficiency arising from anticompetitive conduct. Consequently, single damages would not capture the deadweight losses and inefficient substitutions induced by elevated prices. Because single damages would not reflect the full economic harm of anticompetitive conduct, they would provide insufficient deterrence.[248]

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[243] 15 U.S.C. § 15.
[244] *See* Robert H. Lande, *Are Antitrust "Treble" Damages Really Single Damages?*, 54 OHIO ST. L.J. 115, 124, 168 (1991) (observing that most commentators and courts view deterrence of anticompetitive conduct, rather than compensation of injured parties, as the main purpose of the antitrust laws and that prohibition on indirect purchaser suits enshrines this notion in the case law).
[245] Christopher R. Leslie, *Antitrust Damages and Deadweight Loss*, 51 ANTITRUST BULL. 521, 565 (2006).
[246] Lande, *supra* note 243, at 152.
[247] *Id.*
[248] William M. Landes, *Optimal Sanctions for Antitrust Violations*, 50 U. CHI. L. REV. 652, 656 (1983).

Although they are likely an imperfect measure of the combined effect of wealth transfers and deadweight losses, treble damages may be a reasonable proxy and necessary for providing adequate deterrence against anticompetitive behavior.[249]

Denials of access to essential facilities also need to be distinguished from tying. Although both practices may be used to extend monopoly power in an anticompetitive manner, the two practices are distinguishable and require different remedies.[250] A tie is created when a firm requires consumers interested in purchasing good A to purchase goods A – the tying good – and B – the tied good – from it. Essential facilities claims arise when a firm refuses to provide a necessary input to a downstream rival. The two practices can be thought of as mirror images of each other: Tying forces an unwilling customer to purchase the tied good while a refusal-to-deal turns away a willing customer. To prevent leveraging in the tying context, courts generally require the firm imposing the tie to sell an unbundled version of the goods. In the arena of essential facilities claims, the remedy is court-ordered access to the critical input. While tying and denials of access can both be employed to extend monopoly power, they are tactically distinct and, when anticompetitive, require distinct judicial interventions.

Returning to the example of Windows as an essential facility clarifies the distinction between tying and refusal-to-deal. In the landmark government case against Microsoft, the software giant was accused of imposing contractual and technological between its operating system and browser to foreclose competition in the browser market.[251] Customers were being

[249] *See* Edward D. Cavanagh, *Detrebling Antitrust Damages: An Idea Whose Trim Has Come?*, 61 TUL. L. REV. 777, 786 (1987) ("[T]rebling damages may serve as a surrogate measure, exacting from perpetrators a rough measure of the harm inflicted by their wrongdoing.").
[250] *See* Elhauge, *supra* note 22, at 466-67 (summarizing distinction between refusals-to-deal and tying).
[251] *See* Salop & Romaine, *supra* note 202, at 636-39 (summarizing contractual and technological measures Microsoft used to induce customers to prefer Internet Explorer over other web browsers).

forced to purchase Microsoft's web browser even if they did not want it. Assuming arguendo that only Microsoft's tying of Windows and Internet Explorer was anticompetitive, the firm could have then theoretically denied Netscape and other browser makers from accessing the APIs needed to make Windows-compatible software.[252] Under that scenario, makers of application software would be excluded from the market just as effectively. In certain contexts, tying and denials of access may be substitutes to reach the same result. Prohibiting anticompetitive ties while permitting denials of access to essential facilities may induce dominant firms to choose an alternative route to an identical anticompetitive end.

VII. CONCLUSION

Sound antitrust policy, as widely viewed today, is a product of both good economics and an understanding of the relevant institutional settings.[253] Phillip Areeda argued that the essential facilities doctrine had been developed in response to a legitimate economic problem but had then been extended indiscriminately to address inapposite situations.[254] The doctrine applied in conformance with its original purpose – a narrow but necessary exception to the antitrust norm that firms have no duty to share their assets with others – can continue to serve an economically coherent and welfare-enhancing function. In traditional natural monopoly industries, regulators

[252] *See* Sheremata, *supra* note 207, at 945 (Microsoft allegedly withheld APIs from independent software makers in the early nineties); Samuelson, *supra* note 225, at 1952 ("Microsoft is somewhere in the middle of this spectrum [between a fully closed and fully open system]. It is closer to the open end of this spectrum insofar as it publishes many of its APIs and licenses others. These APIs are generally sufficient to allow independent software vendors (ISVs) to write programs that will operate on Windows-based platforms. Microsoft does not, however, disclose all of the interface information that ISVs might want to know.").

[253] William E. Kovacic, *The Intellectual DNA of Modern U.S. Competition Law for Dominant Firm Conduct: The Chicago/Harvard Double Helix*, 2007 COLUM. BUS. L. REV. 1, 72-73 (2007).

[254] *See* Areeda, *supra* note 7, at 841 ("As with most instances of judging by catch-phrase, the law evolves in three stages: (1) An extreme case arises to which a court responds. (2) The language of that response is then applied – often mechanically, sometimes cleverly – to expand the application. With two few judges experienced enough with the subject to resist, the doctrine expands to the limits of its language, with little regard to policy. (3) Such expansions ultimately become ridiculous, and the process of cutting back begins.").

have assumed the role of enforcing the doctrine. Judicial "second-guessing" of agency decisions in these areas is likely to be duplicative or even economically harmful. The creation of intellectual property rights over upstream research tools and the tendency of certain high-technology platforms to tip to monopoly, however, demonstrate the continuing relevance of the doctrine. The exclusivity of intellectual property rights and network externalities can create durable monopolies, which in turn can be leveraged into downstream and complementary markets. In these "New Economy" markets, in which innovation is an important and perhaps the sole dimension of product quality, preserving some degree of competition may be especially imperative. The essential facilities doctrine as articulated in the *MCI* "five-part" test provides guidelines for analyzing refusal-to-deal claims and ensures that procompetitive refusals-to-deal are not subject to antitrust condemnation.[255] The doctrine, if applied scrupulously, can ensure that monopolies in dynamic industries are not larger than necessary. Given the flexible nature of antitrust doctrine,[256] courts should forget the doctrine's origins in the colossal steel arches of the Eads Bridge in St. Louis[257] and recognize that its future lies in the intricacies of the double helix and object code.

[255] *See supra* Part II.B; Glen O. Robinson, *On Refusing to Deal with Rivals*, 87 CORNELL L. REV. 1177, 1183 (2001-2002) ("I do not suggest there is never an occasion warranting forced dealing between rivals. Following the redoubtable Captain Corcoran, I am content with a 'hardly ever' condition which is best confined to the essential facilities doctrine. While this doctrine has been attacked by antitrust scholars, their criticisms ring hollow when one considers the much vaguer framework used to evaluate refusals to deal independent of whether essential facilities are involved.").
[256] *See* Richard A. Posner, *Antitrust in the New Economy*, 68 ANTITRUST L.J. 925 (2000-2001) ("[A]ntitrust doctrine is supple enough, and its commitment to economic rationality strong enough, to take in stride the competitive issues presented by the new economy.").
[257] *Terminal Railroad*, 224 U.S. at 391.